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12TH REPORT

RAIL, HOPE TOWARD TOMORROW

Sustainability Report 2020

KOREA NATIONAL RAILWAY

About This Report

Overview

Korea National Railway (KR) is committed to fulfilling its social responsibility and role as a state-owned rail infrastructure manager in charge of efficient construction and management of the national rail network including high-speed, conventional, and metropolitan railways.
KR has been publishing the sustainability report every year to communicate with stakeholders by transparently disclosing such efforts and achievements, and this is the 12th report.

Reporting standards

This Report has been prepared in accordance with the Global Reporting Initiative (GRI) Standards: Core option. Contents of the Report were selected based on level of interest and impact through stakeholder participation and materiality assessment. We reinforced management approach on critical aspects to report on the relevant indices.

Reporting period, scope and boundary

This Report contains sustainability management activities and performances of KR's head office and five regional offices from 1 January to 31 December 2019 and includes some activities carried out in the first half of 2020. Key quantitative performances show data for the past three years (2017 to 2019) to indicate changes in recent years for comparison.

Assurance

The contents of this Report were verified by an independent agency to enhance quality and reliability. For more detailed information regarding assurance, please refer to the Assurance Report in the Appendix.

Distribution and feedback

More detailed information on KR's sustainability management activities can be found on the corporate website. Our Sustainability Report is available in Korean and English in downloadable PDF format. If you have any comments/inquiries on this Report or KR's sustainability management activities, please contact us.

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RAIL,
HOPE TOWARD TOMORROW

CEO Message

Changing its name from Korea Rail Network Authority to Korea National Railway in September 2020, KR has relaunched itself to fulfill its responsibilities to improve the quality of people's lives and support sustainable growth of Korea through railways.

Dear stakeholders,

History of Korea's railways began with the Railway Bureau set up in 1894 under the ministry that oversaw transportation, but the country's railways stagnated for decades remaining quite underdeveloped until 1970s. Korean railways sharpened its competitiveness through expansion of urban & regional railways and construction of main lines in the 1980s and 1990s, and the "renaissance of Korean railways" unfolded with the opening of Gyeongbu High Speed Rail in 2004.

Since its establishment in 2004, KR has been improving transportation welfare for people and contributing to national development by building the national rail network, managing rail infrastructure, developing station areas, and engaging in projects in other countries. While leading the Korean railway industry by seeing to opening of 4 high speed rails including Gyeongbu High-speed Rail and some 50 regional and intercity railways, KR has become a proud member of globally advanced rail industry community by being awarded for 69 projects in 21 countries around the world.

In this the 12th Sustainability Report, KR wishes to transparently share with our stakeholders our sustainability management performances from 2019 as well as the roles we must carry out and the direction we must move towards in the post-COVID-19 era as we relaunch under the new name of 'Korea National Railway.'

KR will strengthen transportation welfare for the people and lead balanced growth of regions through the national rail network we build.

KR will contribute to enhancing transportation welfare for the people by efficiently carrying out 46 projects, including the 8 projects to be completed in 2020 and other projects aimed to achieve balanced territorial development. Keeping in step with the recent paradigm shift towards balanced development, KR will expand railways in isolated regions and continue to identify and develop new railways to play a leading role in Korea's balanced development In addition, KR will give its full support so that the 4th National Rail Network Plan that the government pland to make public in 2021 will be forward-looking.

KR will do all it can to prevent accidents and spread of infectious diseases to become an organization trusted by the people.

We will upgrade the railway safety system to create an accident-free railway environment and to prevent spread of COVID-19. Safety will be strictly managed to make safety awareness part of everyday routine at all workplaces. We will strengthen cooperation with the railway operating companies from design to operation of the rail network so that people can feel safe in using the railways.

We will acquire core technologies for the future to lead the eco-friendly railway industry.

To steer railways, an eco-friendly mode of transport, to grow into a core industry in the future, we will secure the core technologies such as commercialization of 400-km/h ultra-high speed trains, application of IoT technology for unmanned rail infrastructure management, and contact-free rail transport services based on big data. In addition, we will apply eco-friendly rail technologies to all aspects of railways from zero-energy stations to eco-friendly construction techniques and facilities using renewable energy.

We will become the stimulus for revitalization of the national economy.

While we have been creating jobs and revitalizing the economy by building railways and using our assets, we also have been helping the Korean railway industry's export to foreign markets through our public-private sector cooperation. In 2019, we publicized the excellence of Korean railway by successfully delivering project management service for Jakarta LRT Project-Phase 1 and winning bids for 6 overseas projects, including PMC services for Jakarta LRT Proejct-Phase 2. We will continue to work with private sector companies to expand our presence in the global railway market.

We will practice the value of co-prosperity and create a prosperous Korea.

KR plays a focal role in Korea's railway industry spearheading co-prosperity with 64,000 employees of small and medium-sized partner companies. As a fair and transparent project manager, we will continue trustworthily in our role to support SMEs and grow together with our railway industry partners. At the same time, we will carry on seeking and practicing ways to contribute to local communities to create co-prosperity values.

Due to COVID-19 pandemic, Korea is facing economic recession, collapse of communal spirit, and distrust of public services and social safety net. KR will fulfill its responsibilities as a public institution that brings happiness to people by creating social values and overcoming the current crisis by building safe and reliable rail network that connects cities and people. Your steadfast interest and encouragement would be much appreciated.

Thank you!

Kim Sang-gyun
Chairman & CEO
Korea National Railway

KR Sustainability

HIGHLIGHTS 2019

Preliminary feasibility studies for six projects were exempted! KR's status and role were strengthened.

KR has been striving to improve the existing 'preliminary feasibility study' system, which focused on economic feasibility to solve discrimination in regional transportation and strengthen the people's rights to travel. We formed a social consensus by hosting a seminar on the role of railway for balanced regional growth and communicated and worked closely with relevant government departments. As a result, the policy evaluation for balanced regional growth attained greater importance. KR was able to shift the direction of railway policy towards social value in the course of this policy improvement process and created a basis for promotion of new projects aimed to serve the people in regions where they could not benefit from railway service. In 2019, preliminary feasibility studies for six routes were exempted, and we anticipate that it will create about 108,000 new jobs in the future.

Vitalization of the people's livelihood and economy to overcome the COVID-19 crisis.

KR is trying to minimize the economic impact of COVID-19 by robustly executing its railway SOC budget. KR executed 89.5% (2,170) contracts planned for 2020 in the first half of 2020 and paid 67.3% (KRW 2,101.6 billion) of advance payment. Also, KR is sparing no financial support for the small business owners and SMEs who are having difficulties because of the spread of the infectious disease. KR reduced the national property-use fees and lease fees by KRW 2.94 billion and created the a KRW 20 billion common growth and cooperation fund to financially support the SMEs. KR will continue to expand and promote its policies aimed to energize the economy while engaging in the epidemic prevention activities to overcome the COVID-19 crisis.

Achieved three consecutive years of positive profit! Helped reduce public debt.

KR is reducing the public debt by cutting down project costs invested in and fund-raising expenses for railway network establishment projects and strengthening its own profit-generating activities. In 2019, KR recorded KRW 948.8 billion profit from asset management and KRW 171.7 billion net income through creative use of railway assets and diversification of projects, achieving 'positive profit for three consecutive years' and 1.35 times interest earned (113% compared to the target). As an enormous amount of government budget has been invested in the establishment of the railway network, KR will keep reducing the public debt by company-wide reduction of project costs and efforts to generate profits.

The first year of investment in deteriorated railway facilities! Secured KRW 2 trillion budget for investment in facility improvement.

KR has been persistently persuading relevant government offices that it needs to modernize the railway facilities in order to proactively respond to deterioration of railway facilities. As a result, KR was able to secure budget of about KRW 2 trillion for investment in facility improvement in 2019. The budget was used to create safe and convenient railway environment, such as improving the deteriorated facilities, expanding railway safety and convenience facilities and so on. As the deterioration rates of railway facilities are rising, KR will provide safe and convenient railway service to the people by efficiently managing its facilities.

A step closer to 'ZERO Corruption' - achieved Level 2, the highest level in KR's history.

Through its strong efforts to prevent corruption, KR achieved 'the Level 2 Comprehensive Integrity among Public Institutions' in 2019, the highest achievement in its history. It was a result of the management, the employees and the external stakeholders working closely together and carrying out the anti-corruption activities. In 2019, KR made practical improvement on 58 anti-corruption systems by communicating and cooperating with the stakeholders and continued its activities to internalize the culture of integrity, such as conducting the ethical management training for employees and partner companies. As a result, KR achieved 'zero corruption cases exposed from the outside' and was recognized as 'an excellent organization for anti-corruption policy evaluation for five consecutive years' in 2019. KR will take the lead on achieving the ethical management in the railway business based on its efforts to achieve 'ZERO Corruption' and 'Level 1 Comprehensive Integrity.'

Selected as 'Excellent organization for greenhouse gas reduction' Became the leader of the eco-friendly railway transportation era.

KR successfully carried out the Public Sector Greenhouse Gas Goal Management System* and reduced the greenhouse gas emission by 33.7% from the BAU (Business As Usual, the expected amount of greenhouse gas emission) for 2019. As a result, KR was selected as 'the excellent organization for greenhouse gas reduction,' and received the Minister's Award from the Ministry of Environment.. Also, KR's record of reducing the annual greenhouse gas emission by 240,000 tons (compared to the reduction by other modes of transportation) from the Honam High-speed Railway Construction Project was officially recognized, and the Project was approved as the greenhouse gas emission right trading system external project*. This approval was the first approval in the area of transportation in Korea and it was significantly meaningful because the eco-friendliness of railway was officially recognized. KR will lead the future of railway transportation by developing the eco-friendly railway technologies, such as the zero-energy railway station technology, while expanding the greenhouse gas emission right trading system external project.

**Greenhouse gas emission right trading system external project: A project where the greenhouse gas emissions were reduced by people's use of railway instead of existing means of transportation is provided in the form of Certificated Emissions Reduction (CER).

Unused railway sites turned into spaces of parenting and business start-up.

KR is actively creating good-quality jobs and solving social problems promoting the projects that utilize the railway assets, such as railway stations, sites near railway stations and complex transfer centers nearby. Especially in 2019, KR contributed to solving the child care and youth unemployment problems by opening a child care center (in Pyeongnae Hopyeong Station) and start-up offices for youth (Station-G, Station-A and Geunwhadong-396) in its unused spaces. As a result, KR won the Minister's Award from '2019 Public Service Innovation Model Case Contest' hosted by Ministry of the Interior and Safety and the Minister's Award from '2019 Active Administration Model Case Contest' hosted by Ministry of Personnel Management. KR will continue to create social value by preparing creative plans to use the railway assets as spaces for communities.

Achieved 'ZERO overdue wages' in all sites of railway business through a company-wide overdue wage prevention campaign.

The 'e-ZERO Overdue Payment System' KR developed by itself is a system that fundamentally blocks overdue wages at construction sites by paying the workers' wages and the construction payments directly to the dedicated bank accounts of prime contractors and subcontractors. KR expanded the scope of the 'e-ZERO Overdue Payment System' to cover all sites of railway business in 2019. KR also reinforced the overdue payment prevention system by mandating subcontracting through an electronic system and introducing a mobile-linked payment monitoring system, etc. As a result, the overdue construction payment and wages that reached KRW 2.6 billion in 2018 became zero in 2019. In the future, KR will implement 'the next generation e-ZERO Overdue Payment System' by adding functions, such as a function that will prevent overdue payment when a construction company goes bankrupt and a function that will monitor payment of appropriate wages to workers. KR will continue its efforts to maintain the overdue wage payment at ZERO, pay appropriate level of wage to the railway construction workers and transparently pay the construction prices.

Overview Of KR

KR is a public institution that builds railway facilities, manages them and carries out businesses related to such facilities to improve transportation convenience for the people and contribute to sound development of national economy.

Profile

As of June 2020

Corporate name	Korea National Railway
Date of foundation	January 1, 2004
Type of organization	Quasi-government signed execution type)
Basis for foundation	Railway Development Act and Korea National Railway Act
CEO	Kim Sang-gyun
Total budget	KRW 8 trillion 291.9 billion
Government contribution	KRW 4,112.1 billion
Credit ratings	Domestic: AAA | Overseas: Aa2(Moody's), AA(S&P)
No. of employees	2,041
Head office	242, Jungang-ro, Dong-gu, Daejeon, Republic of Korea

No. of employees

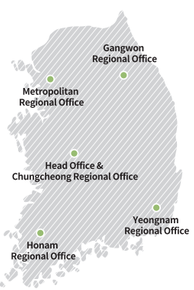
As of December 2020

2017 — Quota 1,436 / Current 1,417

2018 — Quota 1,835 / Current 1,828

2019 — Quota 1,991 / Current 1,940

Offices



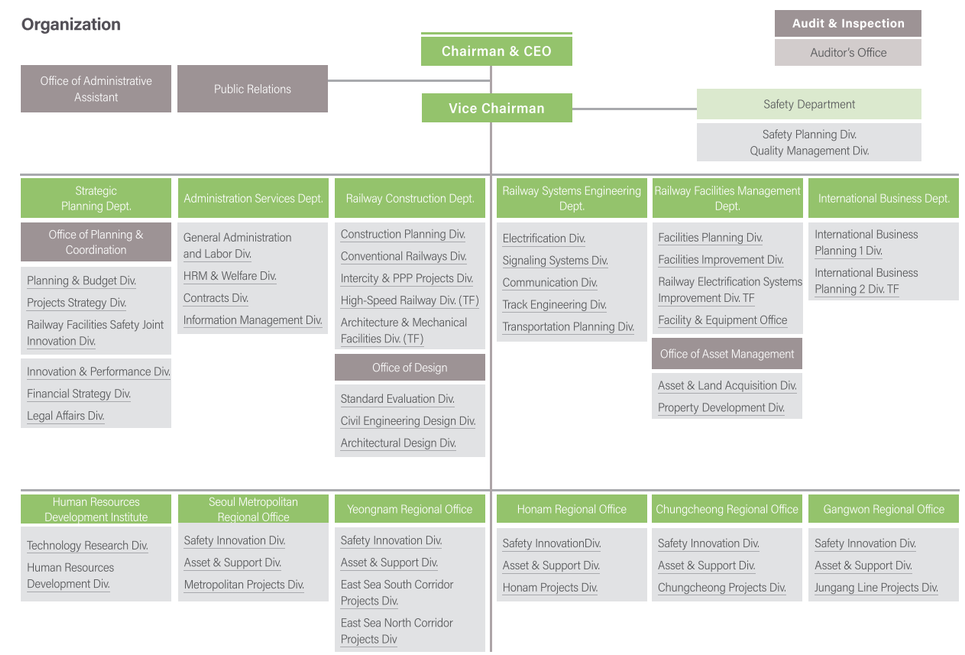
Addresses of offices

Head Office & Chungcheong Regional Office	242, Jungang-ro, Dong-gu, Daejeon, Republic of Korea
Metropolitan Regional Office	378, Cheongpa-ro, Yongsan-gu, Seoul, Republic of Korea
Yeongnam Regional Office	46, 9beon-gil, Chungjangdae-ro, Jung-gu, Busan, Republic of Korea
Honam Regional Office	636-1, Imam-dong, Nam-gu, Gwangju Metropolitan City, Republic of Korea
Gangwon Regional Office	2650, Bukwon-ro, Wonju-si, Gangwon-do, Republic of Korea

Organization

KR consists of seven Divisions, 4 Offices, Group and Institute and five Regional Offices. KR's basic principle on management of organization is to establish the optimized organizational system for an effective execution of projects and an improvement of railway's value as public asset. KR is flexibly responding to the rapidly changing internal and external environments and the social demand by newly establishing Safety Innovation Division and Safety Verification Section dedicated to assurance of safety in 2019.

Organization



History of KR

2004
- Korea National Railway established.
- Gyeongbu High-speed Rail - Phase 1 opened.

2005
- Won HSR construction supervision contract in China.
- Electrified and double-tracked Jungang Line (Cheongnyangni-Deokso) opened.

2006
- Entire Gyeongbu Line was electrified.
- Electrified and double-tracked Gyeongwon Line (Euijeongbu-Dongdoocheon) Opening of double track railway
- Railway Traffic Control Center opened.

2007
- Best rating received for construction supervision services in China.
- Trial run on inter-Korean railway.
- Tunneling between Wangsimni and Seolleung under Han River completed.

2008
- Electrified and double-tracked Cheonan-Onyang Oncheon-Sinchang Line and Janghang Line opened.
- Electrified and double-tracked Jungang Line (Paldang-Guksu) opened.
- Reached KRW 10 billion in overseas contracts.

2009
- Electrified and double-tracked Gyeongui Line (Seongsan-Munsan) opened.
- Electrified and double-tracked Jungang Line (Guksu-Yongmun) opened.

2010
- Awarded HSR construction supervision contracts in China worth KRW 36.5 billion (Lanxin Province/Yunnan, Guizhou section supervision, etc.).
- Gyeongbu High-speed Rail - Phase 2 opened.
- Electrified and double-tracked Gyeongchun Line
- (Sinsangbong-Chuncheon) opened.
- Electrified and double-tracked Gyeongjeon Line (Samryangjin-Masan) opened.

2011
- Electrified and double-tracked Jeolla Line (Iksan-Yeosu) opened.
- Electrified and double-tracked Jungang Line (Jecheon-Dodam) opened.

2012
- Speed enhanced Gyeongchun Line (Yongsan-Chuncheon) opened.
- Speed enhanced Jeolla Line (Iksan-Yeosu) opened.
- Electrified and double-tracked Jungang Line (Yongmun-Seowonju) opened.

2013
- Relocated opened railway inundated by Yeongju Dam.
- Electrified and double-tracked Taebaek Line (Jecheon-Ipseokri) opened.
- Electrified and double-tracked Bundang Line (Mangpo-Suwon) opened.

2014
- Received commendation for excellent construction supervision services (Harbin-Qiqihar Line) in China.
- Performed construction supervision of Beijing-Shenyang HSR.

2015
- Singyeongju-Pohang section of Donghae Nambu Line opened.
- Honam High-speed Rail - Phase 1 (Osong - Gwangju Songjung) opened.
- Gyeongbu HSR linking city centers of Daejeon and Daegu opened.

2016
- Suseo High-speed Rail (SRT) opened.
- Shinbundang Line (Jenongja-Gwanggyo) opened.
- Suin Line (Incheon-Songdo) opened.
- Gyeongjeon Line (Jinju-Gwangyang) opened.
- Donghae Nambu Line (Bujeon-Ilgwang) opened.

2017
- Gyeonggang Line (Wonju-Gangneung) opened.

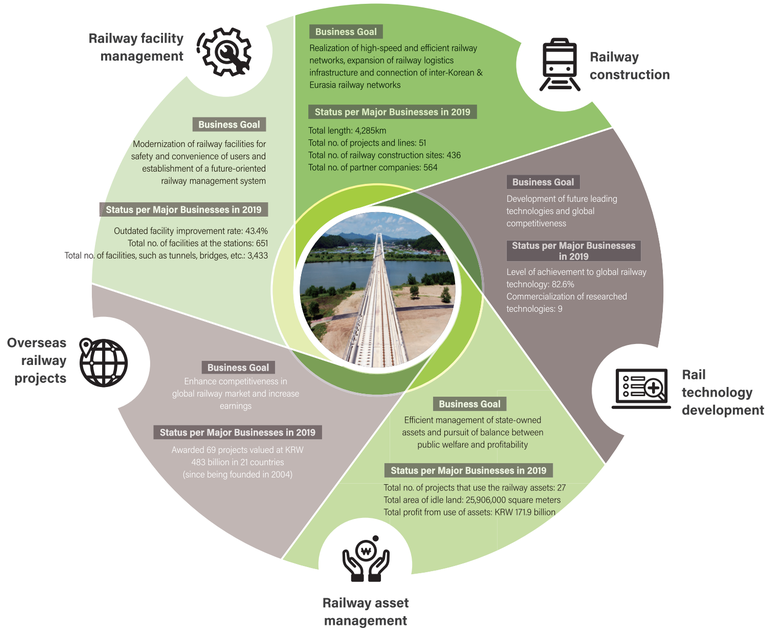
2018
- Rail link to Incheon Airport's Terminal 2 opened.
- Donghae Line (Pohang-Yeongdeok) opened.
- Electrified and double-tracked Seohae Line (Sosa-Wonsi) opened.

2019
- Comprehensive Railway Testing Line was completed.
- Honam High-Speed Rail - Phase 2 (Gwangju Songjung-Gomakwon) opened.
- Gimpo Goldline opened.
- Pohang Youngilman New Port Lead-in Rail opened.

Railway Industry Structure

Main Business and Role

KR is contributing to balanced regional development and growth of the national economy by vitalizing personal and material exchange throughout the country through construction of railway network. Also, KR protects lives and safety of people and realizes a society where people grow together by strengthening facility and asset management focusing on railway safety and social value. Also, KR is making a full preparation for expansion into railway business overseas and development and commercialization of technology linked to the 4th Industrial Revolution to lead the railway industry in the future.



KR MISSION & VISION

KR 2025 Mid-to-long-term Management Strategy

KR is promoting the 'KR 2025 Mid-to-long-term Management Strategy' to preemptively respond to changes in the management environment and achieve harmony between public character and efficiency. In 2019, the assignments, such as 'Safety,' 'The 4th Industrial Revolution,' 'Inter-Korean railway,' etc., were selected considering major issues. In the future, KR will lead the future railway and create social value that can be felt by the people based on the management strategy system.

KR Mid-to-long-term Management Strategy System Diagram

VISION

Faster, safer and more comfortable railways going with the people.

MISSION

Rail network going beyond the Korean Peninsula, towards the world

Strategic Goals

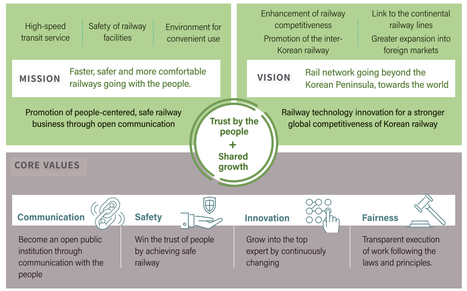
Construct integrated rail network in Korean Peninsula	People's peace of mind Reinforce railway safety system	Secure future growth engines	Create social values
Promotion of the Inter-Korean Railway Connection Project of which length of railways will be 5,020km	Cut railway-facility related accidents by 30%	Achieve revenue goal of KRW 1 trillion	Create 73,000 jobs

Strategic tasks

High-speed and efficiency of railway network	Modernize rail facilities	Improve the value of railway asset	Create more high-quality jobs
Expand railway logistics infrastructure	Build future-style railway management system	Reinforce the roles of overseas business platform	Build a culture of fairness and communication
Prepare foundation for the inter-Korean & Eurasia railway networks	Upgrade railway safety management	Enhance expertise and capability in railway technologies	Lay a customer-centered transparent foundation for management

KR core values

KR selected communication, safety, innovation and fairness as the four core values by applying the viewpoints focused on people, projects and employees. To achieve the mid- to long-term management strategy, the executives and employees of KR are carrying out their works giving the four core values the highest priority. KR will build railway networks and fulfill its social responsibility as a public institution by acting upon its core values.



SPECIAL REPORT

1 Expand Mobility - Expansion of Rail Network for Achievement of Inclusive Transportation Welfare

2 Continuing Efforts for Safe Railway Construction

3 Railway for Common Prosperity and Peace

4 Responding to COVID-19

SPECIAL REPORT 1.

Expand Mobility

Expansion of Rail Network for Inclusive Transportation Welfare

Based on its vision and goals that include balanced regional growth, tolerance, safety and the people's needs, KR is striving to build the national railway network to realize inclusive transportation welfare.

VISION Safe and convenient railway everyone can enjoy!

GOALS
- Fast and safe railway for the people
- Railway of coexistence that grows together with local areas
- Railway for everyone that realizes inclusive transportation

Railway network construction results in 2019

	Total length	Average top speed	High-speed service coverage rate (KTX/SRT)	Electrification rate
Major achievements in 2019	4,285.4 km	179.9 km/h	58.5 %	73 %
Target (2025)	5,022.3 km	193.8 km/h	80.6 %	86.3 %

Projects promoted in 2019~2020 (number of opened and new projects)

Major direction	Elimination of traffic congestion in metropolitan areas	Balanced regional growth	Operation efficiency improvement	Vitalization of railway logistics
Status	9 projects	7 projects	13 projects	5 projects

Elimination of traffic congestion in metropolitan areas

Total of 9 lines
(Eight in the capital region, and one in the Choongcheong region)

Total length
292.49 km

Total project cost
KRW 209,985 billion

Job creation effect
191,033

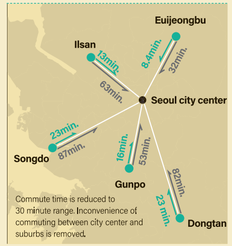
Effects of project

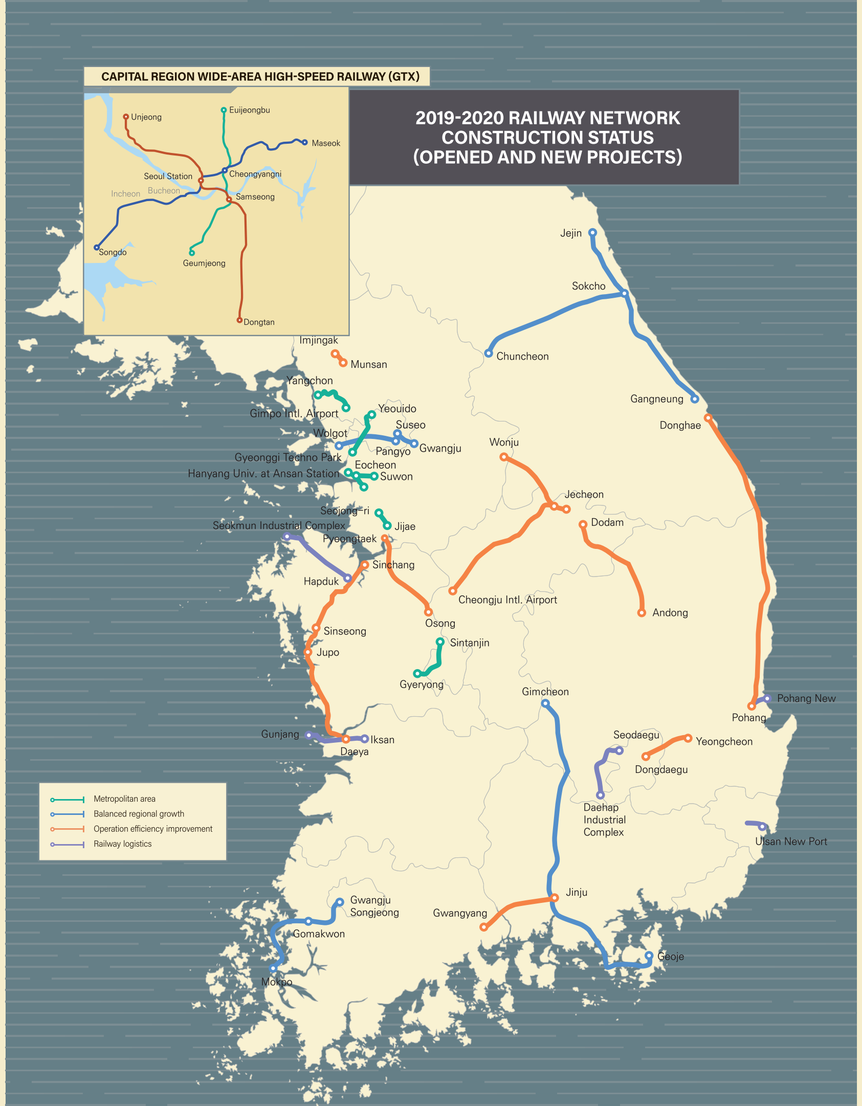
From Gimpo Hangang New Town to Seoul city center in less than one hour (Up to 23 minutes reduced from road transportation)

Establishment of a transportation network that links X-shaped capital region metropolitan area electric railway network and high-speed rail (Gwangmyeong Station)

Improved accessibility to Daejeon and adjoining cities by building the Choongcheong metropolitan area link railway network

Promotion of high-speed transit within the capital region (the 3rd railway network construction plan)





Expansion of new lines for balanced regional growth

7 lines in total
(Two projects of which preliminary feasibility study had been exempted)

Total length 467.8 km

Total cost KRW 14 trillion 752.7 billion

Job creation effect
134,211 Person

Effects of project

Accessibility to Gyeongsang area to be increased by linking to Gimcheon Gumi Station (KTX)

Increased use of east and west axis railway networks and balanced growth in Gangwon area

Establishment of lump-sum transportation system throughout the entire Donghae Line (Bujeon~Jejin)

Increased coverage by Honam High-speed Rail

2019~2020 Promotion of Lines for Regional Balance (Conceptual Diagram)

Improvement of regional mobility by operation efficiency improvement

13 lines in total
(Three projects of which preliminary feasibility study had been exempted)

Total length 694.8 km

Total cost KRW 13 trillion 509 billion

Jobs to be created
122,897 Person

Effect of Project

400km/h class HEMU-430X (first train in the world)

Construction of world's first 400km/h class commercial high-speed rail line (Osong~Pyeongtaek 2 double-track project)

High-speed (2 cases), electrification (4 cases), double-track (6 cases) and straight-line (2 cases) → improvement of railway service, including reduction in inter-regional transit time

Improved mobility between Honam region and Gangwon region and vitalization of Choongcheong wide economic area by increasing the speed of Choongbuk Line

Future goals

Rate of speed increase	('20)43.6% → ('25)50.8%	Rate of double-track	('20)62.5% → ('25)65.12%	Rate of electrification	('20)73% → ('25)83.4%

Railway logistics vitalization project

5 lines in total (Two projects of which preliminary feasibility study had been exempted)

Total length 112.4 km

Total cost KRW 3 trillion 274.9 billion

Jobs to be created*
29,793 Person

Effects of project

Rate of railway incoming line construction promotion** 66.6%
(Eight out of 12 lines, as of June 2020)

Smooth handling of goods transported to and from industrial complexes and ports with high demand for railway transportation

Reduction of high dependence on road transportation (inter-regional cargo transportation rate of 76%) by strengthening eco-friendly logistics traffic system

** The 3rd National Railway Network Construction Plan

※ Applied the calculation method used by employment effect evaluation conducted by Ministry of Employment and Labor for its financial programs for 2020 to measure the job creation effect.

* Preliminary feasibility study: A system that verifies and evaluates policy-related and economic feasibility of large-scale government projects in advance. Seven railway lines for 2019~2020 had been exempted from the preliminary feasibility study according to the direction of government policy, such as balanced national growth, etc.

SPECIAL REPORT 2.

Endless Efforts toward Safe Construction of Railway

KR is exerting its best efforts to achieve zero railway accidents by giving the safety of the people as the highest priority. In particular, KR is promoting integrated accident prevention activities from planning to operation by establishing a joint safety management system with stakeholders, such as business partners, railway operators, etc. KR will continue to do its best to establish a railway network that will allow the people to enjoy transit safely through all-round efforts to thoroughly manage safety risks.

Strong commitment to safety by the leadership of KR

Safety is the first value KR must uphold.

- from the New Year's greetings for 2019 -

BUSINESS GOALS IN THE AREA OF SAFETY

Achievement of safe railway through establishment of management system focused on quality of safety

Construction site disaster rate: 0.2100

STRATEGIC DIRECTION

1. Establishment of safety management system
2. Stronger safety management at business sites
3. Assurance of expertise in safety management

Planning

Stronger dedicated organization and institutional framework

- Launch of 'Joint Railway Facility Safety Innovation Group' for safety management that integrates construction, operation and maintenance (together with Korea Railroad Corporation)
- Creation of 'Safety Innovation Div.,' a division dedicated to safety, in Five Regional Offices
- Reinforcement of 127 staffs dedicated to safety management
- Realization of partner companies' safety management costs by improving safety management cost calculation method

Design

Assurance of safe construction and operation

- Expansion of 'design safety validation' to all projects
- Stronger prevention of construction site worker accident by introducing BIM* design technique
- Expanded application of railway earthquake monitoring system
- Railway station design of 'Excellent' class BF* standard

* BIM: Building Information Modeling, a 3D-base construction information model

* BF: Barrier Free, a certification system for barrier free living environment for the transportation vulnerable

Construction

Assurance of construction site safety

- Introduction of safety equipment for site workers per risk type analyzed by ICT
- Safety training for site workers using VR
- (Data-based) concentrated management on vulnerable areas
- '3.3.3' and '4.4.4' campaigns and 'Safety Call' system

* 3.3.3 : 3 p.m., check three items and three happiness's

* 4.4.4: Themed inspections on every 4th day, 14th day and 24th day

* Safety Call: Worker directly report risk elements in the site and demand for improvement

Completion

Thorough safety inspection before operation

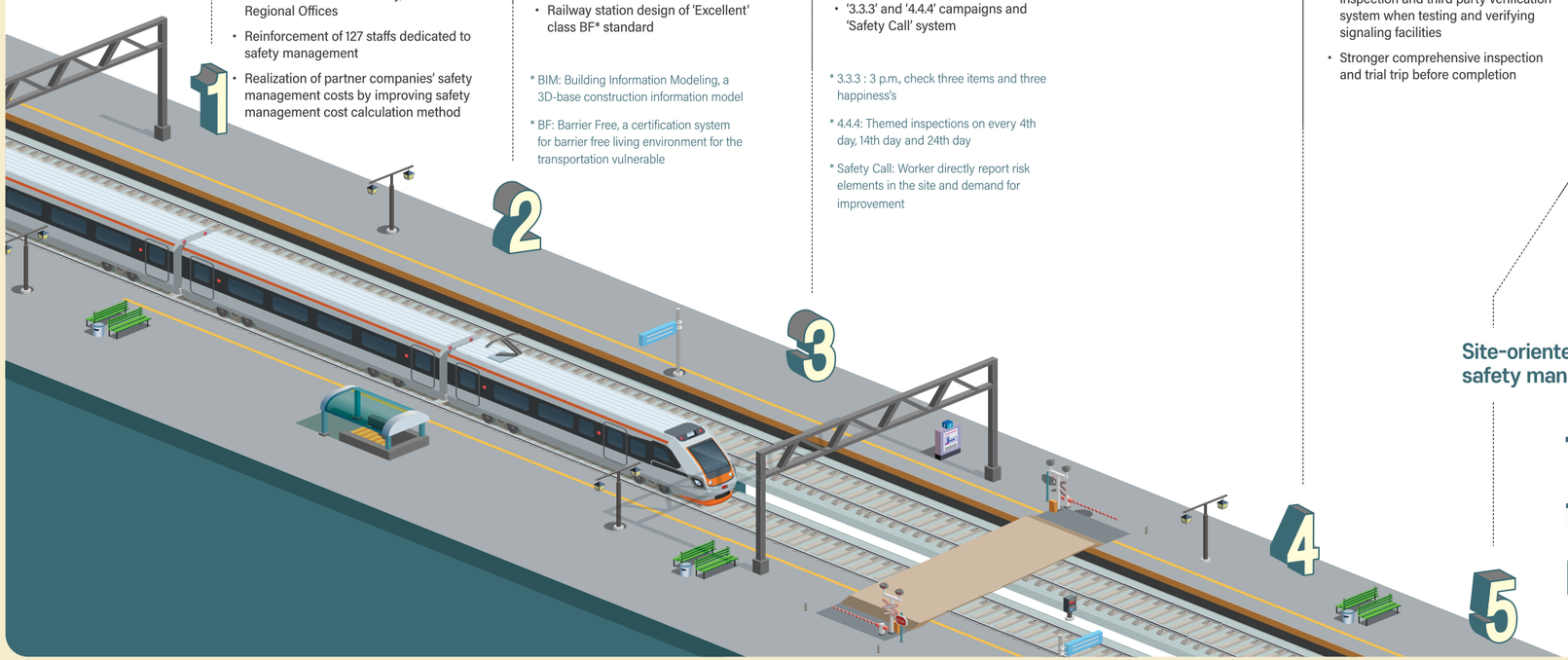
- Introduction of 'joint interlock inspection and third party verification' system when testing and verifying signaling facilities
- Stronger comprehensive inspection and trial trip before completion

Operation

Systematic facility management and response to disasters

- Preemptive improvement of deteriorated facilities by securing a budget increased by 42% (the largest increase in history)
- Establishment of concentrated management processes for major defects and long delayed defects
- Preparation of foundation for facility management per life cycle stage by establishing RAFIS* (The establishment to be completed by 2020)
- Strengthened disaster response system through

* RAFIS: Rail Facilities Information & History System, a comprehensive rail facility history management system



Site-oriented systematization of preventative safety management

The railway trusted by the people!

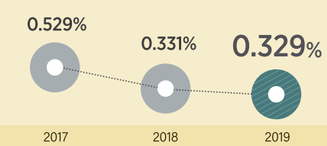
Major safety management achievements

Public institution's safety activity level evaluation in 2019

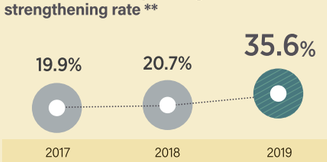
A The top rating

Conducted by	Target
Ministry of Employment and Labor	**Total of 128 public corporations and quasi-government agencies**
Evaluation method	Result of evaluation
Total of five evaluation categories (34 evaluation indices), including safety and health activity achievements, etc.	Total of **813.67** points (average points of public institutions: 723.51) points)

Railway facility safety rate*



Business site safety management strengthening rate **



* Number of railway facility accidents / total length of railway

** No of construction site safety facility improvement / total planned amount

SPECIAL REPORT 3. Railway for Common Prosperity and Peace

Formation of East Asia Railway Community

The Korean government is strengthening its multilateral cooperation activities to bring peace and prosperity to East Asia beyond the Korean Peninsula. KR hosted East Asia Railway Community (EARC) International Seminar together with the Korea Development Institute in 2019 to introduce its detailed plan and promotion road map for East Asia railway community and form a consensus with relevant countries.

Hosting of EARC

East Asia Railway Community
An international conference for common prosperity of and permanent peace in Northeast Asia focused on railway.

* Countries involved: Six Northeast Asian nations (South Korea, North Korea, China, Russia, Mongolia and Japan) and the USA.

Strengthening of Korea-Mongolia railway cooperation

KR is building a practical cooperative relationship with Mongolia, one of the major partners in East Asian railway community, through various discussions.

1. Signing of MOU with Mongolian Railway (MTZ) (Picture 1)
   - Discussed items related to cooperation for new lines and advices for Mongolia Railway Construction Plan, exchange of railway technology and personnel, etc.
2. Hosted the 1st Korea-Mongolia Railway Cooperation Day (2019) (Picture 2)

Sales activities in and mutual cooperation with Southeast Asian countries

Under the Korean government's New South Policy, KR is supporting the construction of railway infrastructure in Southeast Asia while engaging in sales activities to win orders from ASEAN countries.

1. Winning of light railway train consulting project in the Philippines (Picture 1)
2. Signing of MOU to win Medan metropolitan light railway transit project in Indonesia (Picture 2)

Preparation for integrated rail network in Korean Peninsula

KR is expanding essential lines in South Korea to build integrated rail network in Korean Peninsula. KR will make all necessary preparations to immediately start relevant projects when the inter-Korean relationship improves.

Inter-Korean Joint Railway Inspection Group

Donghae Bukbu Line Promotion Ceremony

1. Operation of Inter-Korean Joint Railway Inspection Group (2019) (Picture 1)
2. Promotion of Donghae Bukbu Line construction (to be completed in 2022) (Picture 2)
3. Completed electrification of Munsan - Imjingak section (2019)

SPECIAL REPORT 4. Responding to COVID-19

Small-scale facility improvement project promotion cost (KRW 644.8 billion)

Thorough disinfection activity by the Disaster Counteraction Headquarter

Disaster Counteraction Headquarters

Head of organization (Head of Dept.)

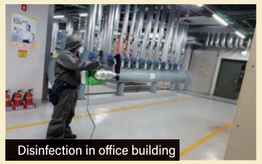
- **Head Office) Five Disaster Counteraction Groups per characteristics of work**
- **(Five Regional Offices) Disaster Counteraction Group per site condition**

Counteraction at construction sites

1. Health checks for the site workers and promotion and training for infectious disease prevention ▶
2. Immediate suspension of work when suspected patient is discovered and referral of the suspected patient to local public health center ▶
3. Real-time identification and reporting of persons definitely diagnosed to have COVID-19, suspected patients and status of work suspension

Prevention of infection in work spaces

1. Introduction of teleworking and work hour differentiation systems
2. Infection prevention activities in office buildings (execution of disinfection, use of thermal camera, etc.)


Disinfection in office building

Use of thermal camera

Execution of business in "untact" style

1. Safety inspection using CCTV and drones and hosting of safety inspection meeting through video conference
2. Public offering of idle land through online (31 cases)
3. Overseas business sales activities through video conferences

Video conference for site safety inspection meeting

Video conference for overseas project sales support meeting (with INCOFER, Costa Rica)

Concentrated efforts on vitalization of public welfare and local economy

Vitalization of public welfare and economy

1. Stimulation of economy by early execution of the budget for first half of 2020

Executed contracts
89.5% (2,170 contracts)

KRW 2 trillion 101.6 billion (67.3%)
made advanced payment in the first half of the year

KRW 644.8 billion
Small-scale facility improvement project promotion cost

2. Reduced national property use fee and lease fee

KRW 2.94 billion in total

3. Increased hiring to vitalize employment environment

148 persons

Social contribution activities to overcome the COVID-19 crisis

1. Social contribution activities in the countries KR won businesses from (provision of materials for disinfection, etc. in Indonesia, Mongolia and India)
2. Local area vitalization activities

Indonesia: Corona 19 Mobile Examination Center

The good donation challenge (by all public institutions in Daejeon)

Social contribution activity - helped the short-handed farms

Delivery of food boxes to the Happy Elderly Welfare Center

Business continuity support for small to mid-sized enterprises

1. Strengthened the joint growth fund

KRW 10 billion (2019) → KRW 20 billion (2020)

Expanded the scope of support to subcontractors

2. Expanded opportunities to participate in bidding

- Increased the upper limit for private contracts
- Limited the qualification for small-sized contracts to local m small to mid-sized enterprises (SMEs).

2020 Railway Day Ceremony

Major direction of railway policy in the post-COVID-19 period ▶

Establishing the Role of Railway in the Post-COVID-19 Period

- Promote digitalization of railway facilities as the core project of the Digital New Deal Policy
- Improve convenience of passengers by introducing unmanned services based on artificial intelligence and big data
- Lead the growth of Korea by innovating railway industry based on safety

1

KR Sustainable

KR CREATING SOCIAL VALUES

- PROMOTING SOCIAL VALUES
- CREATION OF SUSTAINABLE JOBS
- SHARED GROWTH

CONTRIBUTING TO GROWTH OF LOCAL COMMUNITIES

- HUMAN RIGHTS MANAGEMENT

Promoting Social Values

- KR prepared the social value promotion system that reflects social demands, such as strengthening the public nature of railways, realizing a just society, creating jobs and realizing a inclusive country. Accordingly, various tasks for creation of social values are identified and implemented in each project of KR, including railway construction, safety, and asset management. KR will continue to carry out its role, so that railway can contribute to integration and realization of a society that grows together, beyond the expansion of the people's right to travel.

KR's own definition of social value

KR defines social value as "enjoying all values with the people by strengthening the public nature of railway and pursuing social integration through fair management." KR established three directions to practice such definition, which are: 'realization of the value of railway network as the public infrastructure'; 'maintenance of fair management principle and fairness that should be naturally respected by a public institution'; and 'creation of win-win value that can be equally enjoyed by social communities.' KR is trying to create social value in various areas based on such definition.

KR 2019 social value practice system

KR established the social-value promotion goal of 'creation of sustainable social value directed to public, public welfare and community' and prepared five strategies of Safety (ZERO accidents), Equal opportunity (equal opportunity and good job opportunity), Responsibility (win-win cooperation and local development), public Value (stronger public nature focused on the people) and Ethical management (ZERO corruption and ethical management) ('SERVE'). KR is also operating a promotion system where the people and partner companies are invited to participate in the process of practicing the social values to create social values that the people can actually feel.

Social value practice system

Social value	A. Job creation B. Safety/health C. Win-win cooperation D. Regional growth E. Ethical management F. Environmental preservation G. Participation by and communication with the people H. Human rights I. Support for the vulnerable class J. Quality of life				
Goal	**Creation of sustainable social value directed to public, public welfare and community**				
Five Social value strategies - SERVE	ZERO accident, eco-friendly railway Safety	Equal opportunity and good quality job Equal opportunity	Win-win cooperation an regional growth Responsibility	Stronger public nature focused on the people public Value	ZERO corruption and ethical management Ethical management
Tasks	Six Tasks, including joint safety innovation by KR and Korea Railroad Corporation	Six tasks, including improvement of system to enhance quality of employment	Six tasks, including creation of fair economy ecosphere	Six tasks, including improvement of amenities for railway customers	Six tasks, including stronger prevention of corruption and internalization of integrity
Implementation System	People	KR	Collaborating organizations		
	Youth Participation Group • Suggestion of innovation from the perspective of the people KR Civic Participation Group • Review appropriateness of tasks and give feedback	CEO's Promotion Committee • Social Value Department (사회가치부), such as Good Job Opportunity Creation Div.	Government offices • Ministry of SMEs and Start-ups, etc. Local governments and public institutions		

Major directions of improvement

Major directions for improvement of social value practice system in 2019

① Lead vitalization of economy by actively creating jobs through railway construction and use of assets
② Achieve balanced regional growth and promote local area vitalization projects
③ Create healthy economic ecosystem and engage in win-win cooperation by organizing model trade models and strengthen the role of ladder of hope for mid-to-small partner companies
④ Improve human rights of the vulnerable class, including women, and promote tailored support system
⑤ Significantly reinforce safety management system innovation tasks to protect lives of the people and strengthen safety and health for the people

Creating Sustainable Jobs

Context

High-quality jobs lead the country's economic growth, and act as a starting point for finding a solution to structural problems, such as low-growth, bi-polarization, low-birthrates, etc. Demand for creation of high-quality jobs is growing stronger, as the unemployment rate is continuing to rise amidst social problems, including unbalanced distribution of income, youth unemployment, etc.. In particular, the rapidly changing global situation has raised the need to establish a social safety net for the class vulnerable to economic fluctuations. In response to these trends, the government is encouraging the public and the private sectors to create high-quality jobs and focusing on strengthening the future job base through innovative growth infrastructure.

Our Approach

- Job creation in the public sector, such as strengthening of safety area and management of the differences between quota and actual employees
- Job creation in the private sector applying the characteristics of the railway industry
- Creation of tailored job opportunities for SMEs, the socially vulnerable classes, etc.
- Creation of future job opportunities through technological innovation and new business development

Related SDGs

1 NO POVERTY · 8 DECENT WORK AND ECONOMIC GROWTH · 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE · 16 PEACE, JUSTICE AND STRONG INSTITUTIONS

2019 Key Performance

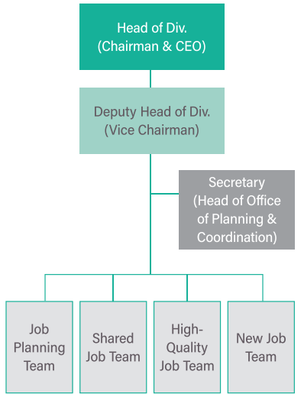
New employment
244 persons
(108 in 2018)

Employment effect of railway business
73,000 persons
(67,000 persons in 2018)

Number of persons hired to develop idle sites
1,816 persons
(1,381 in 2018)

Jobs created by new growth business
550 persons
(378 in 2018)

Good Job Opportunity Creation Promotion Task Force.



Job creation and quality improvement in the public sector

Establishment of sustainable KR job-creation system

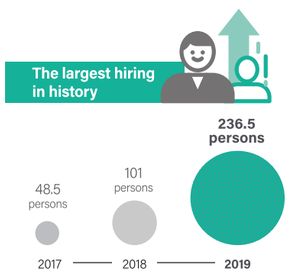
Under the vision of 'achieving social value by creating high-quality jobs,' KR is promoting 10 strategic tasks and 31 specific tasks, in line with the three strategic directions of achieving job sharing in the public sector, creation of jobs in the private sector through expansion and discovery of new growth-engine businesses and improvement of quality of jobs in overall railway industry ecosystem. Also, KR created 'Good Job Opportunity Creation Promotion Div. T/F' to carry out the government's job employment policy according to its plan, which is reviewing job creation performance and continuously supplementing and reinforcing the promotion system.

Vision	Realization of social value through creation of high-quality jobs
Goal	Create 5,846 KR jobs (create 42,300 KR jobs by 2023)
Three strategic directions	Public sector: Shared jobs together with the people Private sector: Future-oriented new jobs High-quality jobs led by the railway
Ten Strategic tasks	• Expand new employment opportunities through job sharing • Continued increase of employment for the socially weak • Improvement of quality of employment and relevant system after creation of jobs • Greater use of idle land and railway station facilities • Development of the 4th Industrial Revolution businesses and new growth businesses • Innovative creation of jobs through public-private cooperation, such as overseas business • Creation of job opportunity ecosystem together with local community by use of assets • Greater investment in railway construction and improvement projects • Extermination of gapjil (power trip) culture and improvement of working environment in the railway industry • Stronger efforts on shared growth and win-win cooperation with mid-to-small companies

Job creation and quality improvement in the public sector

Greater new employment by sharing public sector jobs

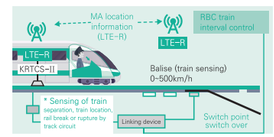
KR is actively participating in the creation of public sector jobs by systematically managing the difference between allocated and actual number of employees and hiring more socially vulnerable persons. KR is actively securing alternative manpower by analyzing remaining capacity for additional employment created by those who are taking leave of absence and by the retired employees, and filled the vacancies created by those who were taking leave of absence with alternative manpower by 100% in 2019. Also, KR is striving to provide sustainable high-quality jobs to various persons who have difficulties in finding jobs, such as the disabled, the children of the persons of national merit, high school graduates, local talented persons, women whose careers had been interrupted, etc. KR newly hired 244 regular employees in 2019 by practicing job sharing, which was twice more than that of the previous year in terms of job creation by the public sector.



Created jobs and improved working environment by hiring more safety management manpower

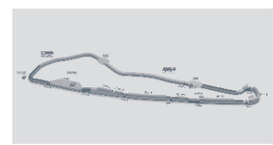
KR has been increasing the number of safety manpower to establish the safety-first management system to cope with large-scale disasters and accidents. In 2019, KR newly hired 127 persons (8.6% of the total quota) for the management of railway safety, as the existing railway facilities are deteriorated and the new lines are opened. By this additional recruitment, KR not only secured enough manpower to cope with the increase of work in the area of safety, but also relieved the heavy workload of the safety personnel as the number of annual safety inspection per worker was reduced by about 43% (219 times to 125 times). KR will continue to secure additional manpower in the area of safety to offer better quality jobs in the public sector and ensure safety of the people..

Efforts toward technology development and innovative industry development for creation of jobs in the future



World's first LTE-R based Korean Train Control System

Development of core technology for 400km/h ultra-high-speed rail



Comprehensive railway testing track

Implementation of zero-energy railway station technology

Property management and safety blindspot inspection using drones

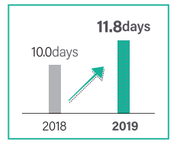
Improvement of practical working condition to improve the quality of employment

KR is creating efficient working conditions to practically improve quality of employment. KR's one-stop land compensation work handling system computerized the entire process of compensation work and reduced the handling time by about 42%, contributing significantly to the creation of an efficient work environment. Also, KR is offering programs, such as the PC-Off system, the Monthly Pause Day, guaranteed break time after night-time work at the site, etc., to support its employees' work & life balance. In addition, KR is continuing to improve the quality of jobs it offers, such as providing various child-raising support programs, improving working conditions of the employees who had been converted to regular employees, etc.

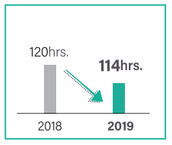
Improvement of working environment for high-quality jobs

Expansion of safety management manpower	Work efficiency improvement	Guaranteed break time	Child-raising support program	Improving working conditions of the employees who had been converted to regular employees
• Frequency of inspection per person decreased by 43% (219 times to 125 times)	• Land compensation system decreased average time of compensation processing from 88.4 minutes to 51.9 minutes	• Increased scope of PC-Off program • Guaranteed break time for night time workers • Operation of the Monthly Pause Day	• Operation of child-raising support programs for each stage of the life cycle (marriage period, pregnancy and childbirth period and infant care period)	• Increase wage • Provision of qualification allowance • Improvement of working environment at guard posts

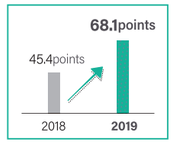
Results of job quality improvement



Number of leave days taken per person



Overtime work hours per person



Level of satisfaction by the converted employees

Family friendly institution certificate by Ministry of Gender Equality and Family for 5 consecutive years

Job creation in the railway industry ecosystem

Increased the number of high-quality, tailored jobs through the railway business

KR is providing many jobs to railway industry manpower by devoting itself to its original business of building railways and managing facilities. Furthermore, KR is creating jobs in the private sector and achieving social value by focusing on the businesses that use the railway assets. KR created jobs for about 73,000 persons through its railway construction and facility improvement projects in 2019 and created about 4,000 jobs by using railway facilities and assets.

2,001 persons	201 persons	75 persons	67 persons
Station district development project, such as commencement of Nonhyun Station (in Incheon) complex development project.	Locally specialized projects for regeneration of old urban center, such as tourist facilities associated with Donghae Nambu Line	Created start-up platforms (Station-G, Station-A, etc.) for young people using idle land under the railway bridges.	Successfully operated Chikchik Cookcook, the food start-up center, with local small business associations.

Created an ecosystem of new job creation through innovation of railway technology

KR is opening a new chapter of technology innovation in the railway industry which includes the Korean-style train control system that integrated IT technology for the first time in the world, development of core technology for 400km/h ultra-high-speed rail, opening of comprehensive railway testing track where new technologies can be verified, etc. KR created about 550 jobs in the courses of such technology development and demonstration projects. Also, KR is building foundations for future innovation in various areas by designing zero energy railway stations using new and renewable energy or managing properties and inspecting safety blind spots using drones, and so on. These efforts will become the driving force of innovation and growth in the Korean railway industry and serve as stepping-stones for creation of a good number of new jobs.

On-site car wash

Nail care

Social equity based recruitment results

The disabled persons and the veterans

Hired the disabled persons (4.7%) and the veterans (6.9%)

Non-capital region

52%

(achieved beyond the target for 4 consecutive years)

Youth interns

5.8%

(achieved beyond the hiring target of 5.5%)

Youth employment

11.8%

(achieved beyond the hiring target of 3%)

Carried out the role of overseas business platform that leads overseas expansion together with mid-to-small companies

KR is actively carrying out the role of a bridge for the private sector railway companies to expand into overseas markets. KR is helping Korean companies to collect overseas railway market information and build networks; helping mid-to-small and mid-sized companies to acquire international certificates on railway parts; and increasing the cases where it is expanding into overseas markets together with them. In 2019, KR participated in six projects, including the Ural HRS project in Russia, with private sector companies, helped 14 companies (including seven mid-to-small companies) expand into overseas market and created 293 jobs by doing so. Currently, KR has formed Team Korea with Korean construction companies to participate in a Turkish PPP project, which is the largest in Korea (KRW 5 trillion). KR will take the lead in expanding into overseas railway markets and creating new jobs by keeping pace with the trends in overseas railway markets where the scale of projects is growing larger and actively developing contract-winning models together with private companies.

Establishment of foundation for creation of sustainable jobs for SMEs and the vulnerable classes

Job-creation through stronger support for mid-to-small companies

KR is creating jobs in the the overall railway industry directly and indirectly by removing many difficulties of SME partner companies and helping them to continue their growth. KR provides large-scale financial aid by creating public-private cooperation fund, shared growth cooperation fund and overseas business funding for SME partner companies. While KR vitalizes product development under the condition of future purchase to help partner companies develop core technologies which is essential to sustainable growth, it helps SMEs publicize their technologies, pioneer the market and hire manpower by operating 'Railway Technology Talk Talk.' As a result, KR helped to create 4,018 jobs in the private sector in 2019.

Railway Technology Talk Talk

KR Partners Fair

Efforts on creation of jobs tailored to the needs of the socially vulnerable class

Securing jobs for the vulnerable classes using the railway assets

As well as hiring people directly, KR is trying to secure additional jobs for the vulnerable classes using its railway assets. As an example, KR is operating a nail care service to help the hearing-impaired persons start businesses and build career (at Busan Station) and an on-site car wash service with a local rehabilitation center to help the socially and the economically weak persons to become independent (at Daejeon Station). KR will make steady and persistent efforts to create more sustainable jobs for the vulnerable and the isolated classes who have difficulties in finding jobs.

Expansion of social equity based employment

KR is making great efforts to expand social equity based employment as a leading public corporation that realizes the inclusive nation. Through efforts to increase frequency and size of new employee hiring, KR has exceeded the legal standard (3%) for youth employment for six consecutive years (11.8% in 2019), contributing to the elimination of youth unemployment. Also, KR has strengthened blind employment and expanded tailored employment screening to exclude discriminatory elements against the local talents from non-capital region. KR designated 21 jobs suitable for high school graduates and hired the largest number of high school graduates (17 of them) ever. KR is also increasing the scale of hiring disabled persons and veterans.

Contributing to Growth of Local Communities

Context

People's expectations of public services are increasing. However, the population is declining and lack of service supply is increasing in the non-capital regions. Also, in non-capital region where the infrastructure is weak, accessibility is weakening, leading to a vicious cycle of slowdown of local economy and declining population. Accordingly, the government is actively promoting policies aimed at vitalizing non-capital regions, such as expanding infrastructure in non-capital regions to achieve balanced regional development.

Our Approach

- Expansion of railway service in areas with poor transportation service
- Promotion of locally tailored cooperation projects
- Use and sharing of railway assets focusing on social value
- Contribution to local economy

Related SDGs

1 NO POVERTY · 2 ZERO HUNGER · 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE · 11 SUSTAINABLE CITIES AND COMMUNITIES · 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

2019 Key Performance

New local lines promoted

7 cases

Number of projects that use idle railway land in local areas

25 cases

(16 cases in 2018)

Expansion of public procurement

4.6 billion

(KRW 1.9 billion in 2018)

Opened a nursery inside a railway station for the first time in Korea

Selected as an exemplary case of public service innovation

(Received the Minister's Award from MOIS)

Establishment of strategy for realization of social value enjoyed together with local community

Provision of system that will help local communities be able to promote the social economy

The Korean government had set vitalization of the social economy as a major keynote policy in response to the structural problems in our society, including regional gap, job insecurity, aging, etc., since 2018. Creation of a social economy ecosystem at the regional level is now emerging as an important topic after the base of execution at a central government level is established, such as social finance policies and policies to foster social enterprises and manpower, etc. KR is trying to make practical contribution to vitalization of the local economy through active networking with the local community, as a public institution that leads realization of social value.

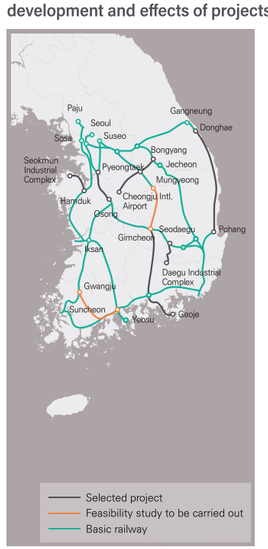
Target	Realization of social value through shared growth with local and SMEs		
Promotion strategy	Cooperation project tailored to local area	Use and sharing of assets	Contribution to local economy
Major tasks	- Support for start-ups and SMEs - Support for the socially and economically weak	- Provision of facilities to local community - Opening and sharing the assets	- Localized win-win cooperation - Increase of partner companies' management vitality

Construction of railway that people can feel, and everyone can enjoy

Promotion of railway construction projects that will bring balanced regional growth

KR discovered railway routes essential to balanced regional growth based on the government's 'balanced national growth project' and persistently persuaded government institutions that those routes were necessary. As a result of such efforts, six railway projects, including Nambu Naeryuk Line, increasing the speed of Choongbuk Line and electrification of Donghae Line, were selected as the projects subject to exemption from preliminary feasibility study. This was a meaningful achievement where KR has contributed to the change in the direction of the railway policy centered on social values. KR will continue to do its best to expand core railway infrastructure for balanced national development.

Projects of which preliminary feasibility study was exempted for balanced regional development and effects of projects



Project name	Description	Effect
Pyeongtaek ~ Osong 2 double-track	Gyeongbu-Honam HSR	Improves high-speed rail servce
Nambu Naeryuk Line	Gimcheon~Geoje high-speed trunk line railway	Connect the capital region and the interior of North and South Gyeongsang provinces
Increasing the speed of Choongbuk Line	High-speed railway network between Cheongju Airport and Jecheon	Connects Honam area and Gangwon area
Daegu Industrial Line	Construction of Daegu National Industrial Complex and linkage to urban railway	Cargo transportation and worker commute become more convenient
Seokmun Industrial Complex Incoming Line	An incoming line to an industrial complex in northwest Choongcheongnam-do. Connected to Seohae Line	Cargo transportation to all parts of the nation
Electrification of Donghae Line	Electrification of Pohang – Donghae section	Provision of high-speed service between Busan and Gangneung

Projects where preliminary feasibility study is exempted

Presents project description, total project cost and purpose and effect of project, per project

Presents cause of exemption from preliminary feasibility study

Discovery of projects subject to exemption from preliminary feasibility study (12 projects)

Pyeongtaek~Osong, Nambu Naeryuk Line, Daegu Industrial Line, increasing the speed of Choongbuk Line, Seokmun Industrial Complex, Susaek~Gwangmyeong, etc.

Panel discussion on balanced regional development

Improvement of preliminary feasibility study system, such as expansion of weighted value for balanced regional development

KR fundamentally improved the preliminary feasibility study system to continuously discover and promote railway projects for balanced regional development. KR hosted seminars and open panel discussions to persuade government organizations and present improvement plans, so that the items for balanced national growth would be given greater weight when they were evaluated. As a result of such efforts, weighted value on regional balance of railway routes in non-capital region was added, and a foothold for promotion of projects in the areas not covered by railway was created by separating economy analysis and comprehensive evaluation and dualizing evaluator institutions. KR will continue to expand its railway transportation coverage so that it can improve the quality of life for the residents in the areas isolated from railway transportation.

Preliminary feasibility study

Before	After
Feasibility studies were carried out focusing on economy, widening the transportation infrastructure gap between capital region and non-capital region. One institution carried out economy analysis and comprehensive evaluation to consider multilateral national policy.	Added the weight on regional balance to railway routes in non-capital areas. Dualized evaluators by separating economy analysis and comprehensive evaluation.

articipation in local community and operation of local economy vitalization programs

Promotion of locally tailored cooperation projects

KR is promoting tailored cooperation projects together with local governments and companies using national properties. Station-G and Station-A in Ansan, the start-up platforms opened by using the idle land under railway bridge, are not only providing the youth and those who are preparing to start their businesses the new opportunities to achieve their goals, but also bringing strong energy to the local community. At Chikchik CookCook, a food service business start-up center at Seoul Station operated and jointly marketed by KR and local small business association, young persons who are preparing to start their own food service businesses are building their experiences and know-hows. In addition, many projects aimed at turning run-down areas near railways into local landmarks, such as the cultural plaza at Gongju Station, Arakkabi Themed Road creation project in Haman, etc. are being promoted. KR will continue to listen to the voices of local residents to create railway spaces that contribute to urban rehabilitation and strengthen local competitiveness.

Station-G

- Support for the start-ups and those who are preparing to start their businesses
- 14 offices for business start-up (880㎡)

Geunhwa-dong P6

- Supports local handmade craft start-ups by young persons
- 30 Containers (470㎡)

Cultural Plaza at Gongju Station

- Creation of Baekje-themed story-telling park using Gongju Station and its plaza

Station-A

- Helps young artists to create their studios
- 6 Artist workshops (710㎡)

Chikchik Cookcook

- Supports young persons who are to start food service businesses
- 8 Outlets on the 2nd floor of Seoul Station

Bongmyung Play Zone (TBD)

- Creation of space for culture and start-up using the land below railway bridge (7,300㎡)

Helping local communities using railway facilities

Resolved the childcare problem by opening a day care center in the train station

KR opened the nation's first daycare center in a train station at Pyeongnae Hopyeong Station in Namyangju in 2019. By providing childcare service to the commuting workers at the train station, KR is helping to solve the problem of childcare in the local community. This project transformed the train station that had been used only as a functional space for ticket sales and train rides into a space for realization of social values and job creation, and it was selected as an excellent example of public service innovation felt by the public and won the Minister's Award by MOIS. KR plans to open three more daycare centers by 2020 and will continue to expand them in the future.

Won the Minister's Award by MOIS for excellent example of public service innovation

Pyeongnae Hopyeong Station Daycare Center

270㎡ of interior space and 162㎡ of play area outside the building (Capacity: 30 children 4 years and younger)

Provision of shelter to local victims of major disasters

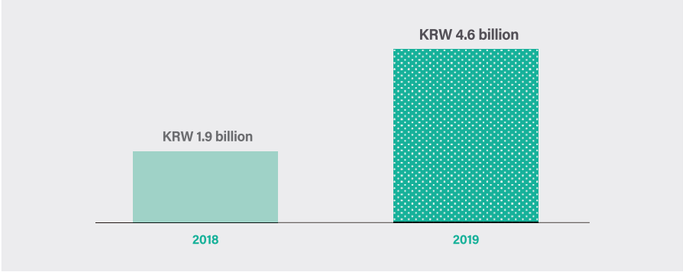
KR's railway facilities play a meaningful role in the event of a major disaster. KR had reformed its train station facilities into training centers and provides those training centers to the people in the event of a disaster. In 2019, the victims who suddenly lost their homes due to a large forest fire in Gangwon-do were able to draw their bodies and minds together at the Mangsang Training Center KR provided as a temporary shelter. KR will continue to do its best to contribute to the lives of local residents with its railway assets.

Stronger support for vitalization of the social economy

KR implements a preferential policy to help local start-ups and small business owners who just started their businesses develop sales channels in the early period of business. KR held "Let's Go Together" using the waiting room of Daejeon Station to promote social economy enterprises and support product sales, and participated in the "Korea Social Economy Public Procurement Consultation Conference" to support the market development of 10 companies. The KR also encourages all Regional Offices to purchase products from social economy enterprises by improving the product screening standards to focus on social values and training the purchasing managers to have greater awareness on public procurement.

Korea Social Economy Public Procurement Fair

Expansion of public procurement



1 Company, 1 village volunteer activity in rural areas

Love sharing flea market

Vitalization of local areas by strengthening local community network

Promotion of community-based social contribution activities

KR is continuing to expand the beneficiaries of its social contribution activities. First of all, KR has entered into 1 company, 1 village relationships with the local communities that need helping hands. For Mochi Village in Youngdong, KR's employees visit the Village every year to help the farmers during the busy season. KR's employees also host the 'Love Sharing Flea Market' that publicizes regional products and donates the entire profit to the projects that help the marginalized classes. In addition, KR is growing together with the local community through regular support for welfare organizations and KR Youth Group.

Social contribution through network of related organizations

KR actively promotes social contribution activities through collaboration with local governments and other public institutions. In 2019, KR organized "Publico Daejeon," a consultative body for social contribution by public institutions in Daejeon, and conducted various social contribution activities, such as guerrilla gardening, house fixing events and so on. In the future, KR will continue to implement sharing management that better meets the needs of the local community based on networks with other local organizations in the region.

Production of railway station storytelling documentaries linked to local areas

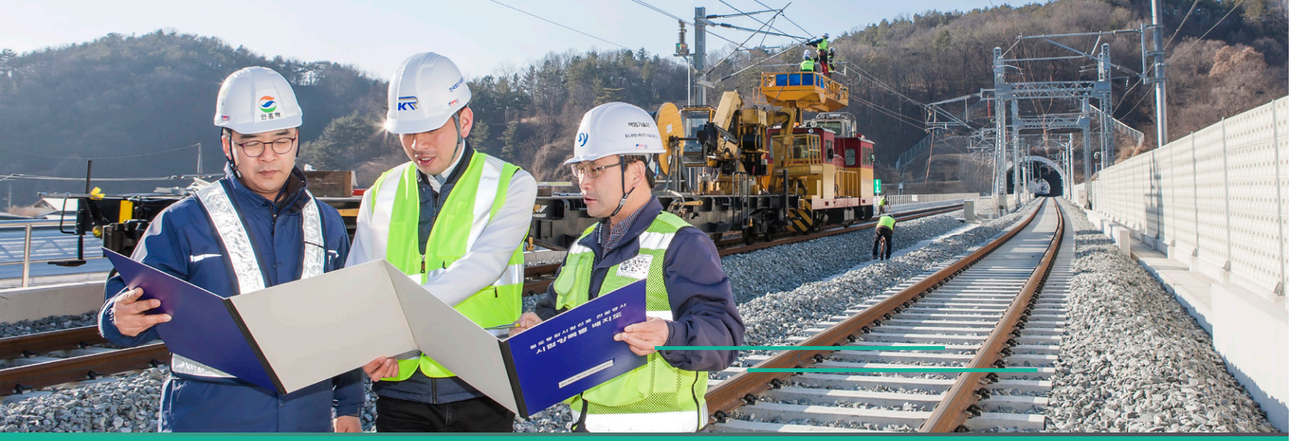
In 2019, KR launched a project to produce storytelling documentary of railway history with an ambition to turn 120 years old history of railway construction into the railway record heritage. KR is producing storytelling contents that reflect the characteristics of 650 railway stations in the nation and tourist attractions in the area. Based on those contents, KR plans to develop tour routes that explore the regions and make the railway stations into local landmarks that domestic and foreign tourists will scramble to visit. The local landmark railway stations that KR will create in the future will serve as a catalyst for the regeneration of the original city center and the revitalization of the local economy as local attractions that create new added values.

Documentary production process

3. Publication of railway station exploration guidebook
2. Production of railway station documentary with excellent storytelling
1. Selection of major railway stations

Selection of railway stations with competitive contents in each category

A The furthest extreme type	The highest, the lowest, the furthest to north, south, east and west, 'the closest to the sea', etc.	
B 'Where the people meet' type	Hongik Univ. Complex Station, Yongsan Station, Dongdaegu Station, etc.	
C 'Railway station with history'	Seoul Station, Daejeon Station, Iksan Station, Naju Station, etc.	
D Cultural tourism type	Jeonju Station, Shingyeongju Station, Gangneung Station, Pyeongchang Station, Jungeup Station, etc.	
E Unique / cultural asset type	Neungnae Station, Auraji Station, Hwabon Station, Samcheok Haebyeon Station, etc.	



Shared Growth

Context

In the modern society, the complexity of technology and the trend of industrial convergence are expanding, and the aspect of global competition has also shifted to competition among corporate networks. Accordingly, strengthening the capacity of partner SMEs and building mutual trust with them are emerging as survival strategies for companies. In addition, the level of demand by society for a fair economy has been strengthened, and the fulfillment of social responsibility through shared growth has become an important issue that should not be missed for sustainable growth.

Our Approach

- Fulfillment of a fair railway industry ecosystem
- Prevention of overdue payment to subcontractors and improvement of working environment
- Promotion of management vitality for mid-to-small and start-up companies and support for new technology development
- Strengthening of shared growth by vitalizing joint overseas expansion

Related SDGs

8 Decent Work and Economic Growth
9 Industry, Innovation and Infrastructure
10 Reduced Inequalities
16 Peace, Justice and Strong Institutions

2019 Key Performance

Fair economy system improvement

60 contracts

Eradication of overdue payment to partner companies

Achieved ZERO overdue payment

Contracts won together with partner companies

3 contracts

Procurement of products developed under the condition of future purchase

KRW **425** billion
(KRW 408.1 billion in 2018)

Rate of procurement from SMEs

39.9%
(31.9% in 2018)

Shared growth promotion system

Under the vision of 'leading institution of shared growth with SMEs in the railway industry', KR formed a task force to build and implement a master plan for shared growth. KR set 3 major strategic directions of the master plan for shared growth, which include 'vitalization of fair trade in overall railway industry', 'support for growth of mid-to-small companies', and 'development of new technology and reinforcement of quality' and is carrying out 30 key projects. KR will realize the value of shared growth in all areas of its business, including railway construction, technology development and overseas business, by faithfully implementing the shared growth promotion system.

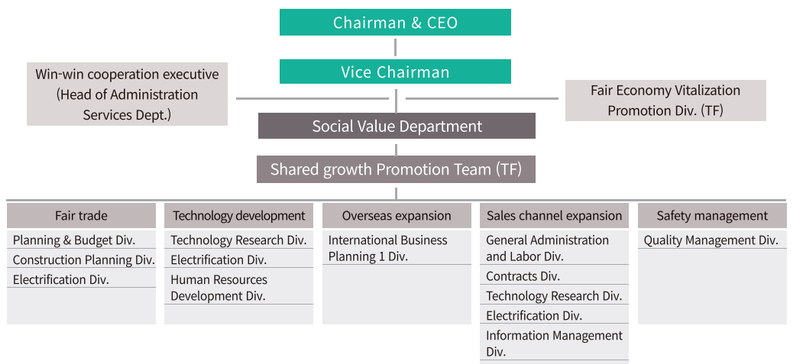
Master plan for shared growth

Social value	Leading institution of shared growth with SMEs in railway industry		
Goal	Realization of social value through shared growth with mid-to-small companies		
Three Strategic directions	Vitalization of fair trade	Support for growth of mid-to-small companies	New technology development and reinforcement of quality
Six Strategies	Fulfillment of fair railway industry without power abuse Prevention of overdue payment to subcontractors and improvement of working environment	Promotion of management vitality for mid-to-small, start-up and local companies Vitalization of joint overseas expansion	Help SMEs develop and protect new technologies Reinforcement of railway safety quality together with partner companies
30 Main tasks	1.1. Reinforcement of continued communication between KR and partner companies 1.2. Reinforcement of subcontracting management 1.3. Substantialization of Unfair Subcontracting Resolution Center operation 1.4. Regular monitoring for eradication of unfair special contracts 1.5. Vitalization of ZERO Power Abuse Center 1.6. Self-purification activity for eradication of corruption 2.1. Advancement of e-ZERO Overdue Payment System 2.2. Promotion of construction worker electronic card system appropriate wage system 2.3. Promotion of working environment improvement at construction site	3.1. Leader of contracting system that reflects fairness, win-win relationship and social value 3.2. 2 Support the government's innovative growth policy by supporting the start-up companies 3.3. Application of fair market price and support for sales of products from mid-to-small companies 3.4. Creation of Station-G 3.5. Expansion of shared growth cooperation fund 3.6. Implementation of craftsman class system 3.7. Vitalization of local win-win cooperation 3.8. Expansion of accessibility to public data 4.1. Systematic support for dividing roles between the government, KR and private companies 4.2. Investment in PIS and GIF funds 4.3. Global infrastructure fund 4.4. Creation of overseas expansion ecosystem through regular communication with mid-to-small companies 4.5. Project to support acquisition of international certificate for railway equipment	5.1. Technology development project under the condition of future purchase and public-private joint technology development project 5.2. Continued operation of conference of companies to which KR entrusted with technology development 5.3. Regular implementation of Railway Technology Talk Talk and Technology Agora 5.4. Expansion of research base by technology exchange with relevant institutions 5.5. Participation in establishment of integrated technology market platform by SOC institutions 5.6. Implementation of technology protection awareness improvement training and advertising 6.1. Training to strengthen mid-to-small partner companies' quality assurance capacity 6.2. Public contest for railway construction site safety slogan 6.3. Substantialization of safety management through tailored inspection

Major achievements

1. Selected as "Attentive Institution" by Ministry of SMEs and Startups for the first time among public institutions
2. Achieved 39.9% SMEs product purchase rate (8% increase compared to previous year)
3. Entered into new contracts worth KRW 927 million (substantially increased from KRW 3 million in 2018)
4. Won 3 overseas projects together with 6 partner companies (won 1 overseas project together with 1 partner company in 2018)
5. Achieve KRW 9.1 billion in demonstrative procurement of technology development products (727% increase (KRW 1.1 billion) from 2018)
6. Provided financial support equal to KRW 8.3 billion to 29 companies (increased by 553%, from KRW 1.5 billion to 8 companies in 2018)

Task force dedicated to shared growth

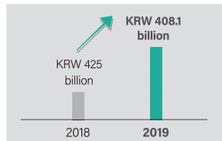


Support for customized shared growth

Localization of railway technology and sales channel exploration by helping SMEs' efforts on technology development

Through the "development project under the condition of future purchase," KR provides a portion of development cost for new railway technologies to SMEs and directly purchases them after the development is completed. This project helps SMEs secure core technologies while contributing significantly to localization of railway technology. In addition, KR has signed an MOU with the Ministry of SMEs and Startups to expand pilot purchase of products from start-ups and mid-to-small companies. KR is also supporting them with product promotion and sales channel development by participating in 'Railway Technology Talk Talk' and public procurement fairs.

Expansion of development under the condition of future purchase



Railway Technology Talk Talk

Public procurement fair

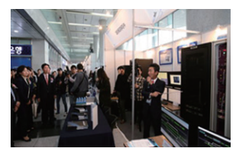
Hosted KR Partners Fair to support shared growth with SMEs

KR held KR Partners Fair, a shared growth exhibition, to provide a venue for continued win-win and cooperation with related SMEs. The 'Win-Win Talk Talk Conference', in which KR and SME railway construction companies participate, shares various opinions under the theme of shared growth and regulatory reform, and supports the expansion of sales channels by exhibiting excellent technologies of mid-to-small partner companies. Also, KR is saving no effort to provide company-wide support for shared growth by setting up recruitment fairs to help SMEs resolve the difficulty of finding the right talent.

KR Partners Fair

Win-Win Talk Talk Conference

Exhibition of partner companies' excellent technologies



Selected as "Attentive Institution" by Ministry of SMEs and Startups for the first time among public institutions for the efforts on shared growth

In order to support the growth of SMEs and to realize social values, KR is promoting projects to build meeting spaces for entrepreneurs of start-ups and venture companies and to open daycare centers using railway station facilities. In recognition of such efforts, KR was selected as the first public institution to be recognized by the Ministry of SMEs and Startups as the Voluntary Win-Win Cooperation Institution. KR also signed a business agreement with the Korea Venture Business Women's Association for promotion of work-family compatibility and business start-up for business persons at start-ups, venture companies and mid-to-small companies. In the future, KR will strive harder to lead the shared growth with the mid-to-small companies as the first Voluntary Win-Win Cooperation Institution among public institutions.

Selected as the Voluntary Win-Win Cooperation Institution

Business agreement with the Korea Venture Business Women's Association

Received the appreciation plaque from Ministry of SMEs and Startups

Vitalization of SMEs' efforts on technology development and helping them in their overseas expansion through financial support

KR is helping SMEs to stabilize their financial conditions by operating various financial support programs. KR established and is operating a technology development cooperation fund for securing core technologies and a shared growth cooperation fund for low-interest financial support for SMEs in railway industry. In addition, KR is helping SMEs that lack overseas business experience and capacity to become competitive in winning orders in overseas construction markets by operating the Global Infrastructure Fund (GIF) and the Global Plant, Infrastructure and SmartCity Fund (PIS).

Financial support funds for SMEs (2019)

Public-private cooperation fund for technology development
- **Creation of technology development cooperation fund and support for stable technology development**

* Size of fund: KRW 2 billion

+

Shared growth cooperation fund
- **Creation of low-interest rate loan to partner companies (KRW 10 billion) and expansion of support**

* Increase loan limit (KRW 200 million to 500 million)
* Expanded the scope to excellent employers

+

Public-private cooperation fund for technology development
- **Creation of PIS fund (KRW 1.5 trillion) and GIF fund (KRW 0.4 trillion) for financial support**

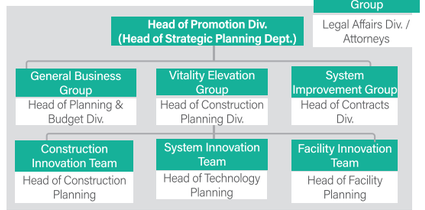
* KR's investment in the funds: KRW 33.3 billion in PIS and KRW 10 billion in GIF

Establishment of order for fair economy

Company-wide efforts on overall improvement of unfair practices

KR is separately operating the KR Fair Economy Vitalization TF to promote fair economy throughout the company. In 2019, as many as 60 tasks were discovered and improved in an effort to eradicate unfair practices that can occur in each project. In particular, KR has noticeably strengthened the tasks related to fair management and reinforcement of safety of subcontractors by reflecting social demands such as eradicating power abuse and protecting site workers.

Formation and activities of KR Fair Economy Vitalization Promotion Div.



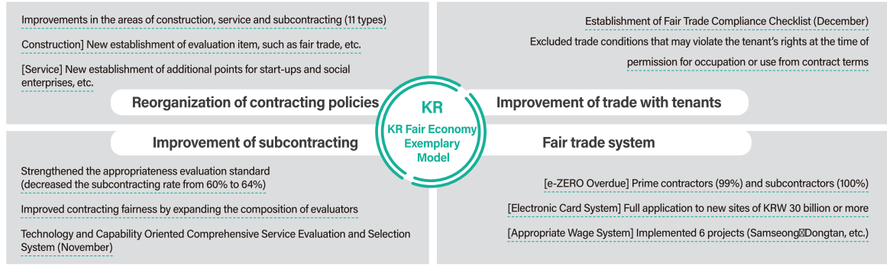
Results from promotion of improvement activities

Collected VOCs from the field through meetings with partner companies, etc.
→ Discovered and completed 60 new tasks for improvement

Area	Policy	Construction	System	Facility	Others	Total
ompleted	5	17	13	15	10	**60**

Improved unfair practices and established exemplary traing model for public institution

KR established the 'KR Fair Economy Exemplary Trade Model' to create a fair market economy. This model complies with the government's 'Exemplary Trading Model' guidelines. KR has established and spread fair trade with partner companies, subcontractors and tenants of railway assets by improving the policies and establishing the systems based on this Model. KR will continue to strive to establish a fair market order and improve the rights and interests of the people.



Improved bidding and evaluation systems to ease entry barriers into the railway business for mid-to-small companies.

KR is expanding opportunities for SMEsto enter the railway business by drastically improving the system. In particular, KR is preventing recklessly low-priced bidding and paying proper construction costs by reflecting realistic construction, subcontracting and safety management costs through the improvement of bidding and evaluation systems. In addition, KR eased the standards for evaluating the ability of the service provider to implement a project, thereby lowering the barriers against entry into the railway business. In the future, we will continue to monitor and improve the system to become a win-win partner to mid-to-small companies.

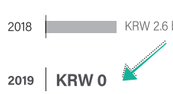
Support for shared growth with subcontractors

KR is also making great efforts to improve the systems for shared growth with railway construction project subcontractors. In order to protect the rights and interests of construction and service subcontractors, KR strengthened the standard contract review when subcontracting contracts were executed and mandated the joint contract method between large and SMEs when construction orders worth KRW 20 billion or more were placed. In addition, KR is expanding the scope of its material suppliers by purchasing railway materials directly.

Improvement of contracting system for shared growth (2019)

	Target	Before improvement	After improvement	Expected results
Construction	Evaluation standards under the Comprehensive Evaluation and Selection System	• Balanced price is calculated by acquiring the arithmetic mean excluding the top 40% and the bottom 20% of bid amount	• Balanced price was raised as the upper and lower 20% were excluded	Appropriate construction cost was applied
		• Subjects of subcontracting plan review: 60% or more of design price	• Subjects of review was raised to 64% or more of design price	Reinforced management of low-price subcontracting
	Bidding qualification evaluation standard	• Reduced safety management cost by applying bid winning rate	• Bid winning rate is not applied to safety management cost	Payment of appropriate level of worker protection cost is ensured
Service	Service Project execution capability evaluation standard	• [Credit rating] Full marks A- • [Engineer] 20 years for senior engineer, etc.	• [Credit rating] Full marks was adjusted to BBB- • [Engineer] Adjusted to 15 years for senior engineer 10 years for senior engineer per area	Eased entry barrier against mid-to-small companies
Products	Bid winner qualification evaluation standard	Start-ups and small businesses had difficulty developing sales channels in their early stages	• Newly established basic additional points for delivery reference (0→3 points) • Increased the reference period (recent 5 yrs. →7 yrs.)	Preferential policy for sales channel development support

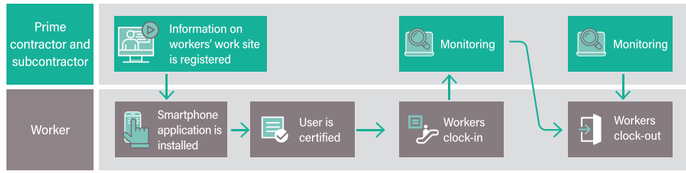
Achieved ZERO overdue payment



Achieved 'ZERO overdue wage' in all sites of railway business by a company-wide overdue wage prevention campaign.

KR has expanded the existing e-ZERO Overdue Payment System and Electronic Card System to solve the problem of overdue payments of construction cost and construction workers' wages. KR is reinforcing the transparency of wage and construction cost payment by applying the e-ZERO Overdue Payment System to all railway construction sites and improving the Electronic Card System so that prime contractors and subcontractors can confirm the entire process of payment request, approval and payment through the electronic system. In addition, KR expanded the Electronic Card System, which was introduced to prevent delayed payment of wage and mutual benefit fund for retirement, to projects worth KRW 10 billion or more (by lowering the standard from KRW 30 billion or more) and developed a smartphone app to enhance the convenience of workers. Through these company-wide efforts, KR achieved 'ZERO overdue payment' at the railway construction sites in 2019.

Development of smartphone application



Human Rights Management

Context

Public interest in human rights management has been increasing due to the recent controversy over power abuse which has become a social issue, and corporate responsibility to protect consumers from human rights violations, such as violation of health rights and life rights, by products is being emphasized. In particular, if a public institution violates the human rights of the people in the course of performing its duties, it may lead to the issue of national responsibility, thus, public institutions are required to protect and respect human rights at a greater level.

Our Approach

- Advancement of human rights management promotion system
- Human rights management training and human rights management support for partner companies
- Reinforcement of the vulnerable class (women, etc.) support system
- Provision of human rights violation relief process

Related SDGs

1 NO POVERTY · 3 GOOD HEALTH AND WELL-BEING · 5 GENDER EQUALITY · 10 REDUCED INEQUALITIES · 16 PEACE, JUSTICE AND STRONG INSTITUTIONS

2019 Key Performance

Level of awareness on respect for human rights

76.9%
(65.5% in 2018)

Number of female managers at work

49 persons
(42 in 2018)

Human rights management training for executives and employees

1,748 persons
(130 in 2018)

Rate of social equity based employment

152%

Number of human rights violation

0 contracts

KR Human rights management promotion system

Promotion system for vitalization of human rights management

KR has personnel dedicated to human rights management, the Human Rights Management Committee and the Human Rights Management Working Group for each unit organization based on the human rights management standards that reflect the conditions of the railway projects. Especially in 2019, KR established and implemented action plans for vitalization of human rights management, conducted human rights management impact evaluation and factual surveys, and prepared a system to relieve human rights violations.

Human rights goal

Realization of trusted KR through organizational culture that respects and cares

Direction of implementation

- Phased human rights management appropriate for the institutional characteristics
- Prevention of human rights risk through human rights management impact evaluation
- Human rights management through communication with stakeholders
- Settlement of human rights violation prevention and relief system

3-year road map

Establishment of foundation (2018)
- Creation of human rights management directives
- Establishment and amendment of human rights management regulations
- Creation of organization dedicated to human rights

Vitalization (2019)
- Establishment of human rights management execution plan
- Human rights management impact evaluation and inspection
- Human rights violation relief system

Advancement (2020)
- Precise diagnostics and advancement
- Discovery of human rights violation case → training and spread of response plan

Human rights management impact evaluation and human rights awareness inspection

KR comprehensively evaluates and manages human rights risks related to its operation and railway projects through human rights management impact evaluation. In addition, KR regularly investigates human rights awareness of its employees and partner companies to determine how to improve human rights management and cases of human rights violation. As a result of the KR's own survey on human rights management impact evaluation and awareness on human rights in 2019, no case of human rights violations was found, and 12 cases recommended for supplementation were promptly improved.

Human rights management impact evaluation indices

(207 indices in 14 classifications)

No	Evaluatio n indices classification	No. of indices
1	Establishment of human rights management system	30
2	Non-discrimination in hiring	17
3	Guarantee of rights to association and collective bargaining	16
4	Prohibition of forced labor	11
5	Prohibition of child labor	14
6	Guarantee of industrial safety	17
7	Responsible supply chain management	10
8	Protection of local residents' human rights	10
9	Guarantee of environmental rights	18
10	Protection of complaining customers' human rights	15
11	Protection of employees' human rights	7
12	Land acquisition and property operation	17
13	Construction and supervision	18
14	Facility management	7
	Total	**207**

Improvements

Evaluation indices classification	Evaluation result	Improvements and plans
Establishment of human rights management system	• There is no human rights management result evaluation and reporting procedures. • There is no procedure for notification of relief process	• To amend the human rights management implementation directives (in the first half of 2020). • To amend the human rights violation relief process.
	Inconvenient to approach the relief procedure	Established human rights consultation center in the corporate website.
Responsible supply chain management	• Human rights violation prevention and monitoring on partner companies were not carried out. • Need to strengthen human rights management at partner companies.	• Applied statements on protection of and respect for human rights were added to bidding announcement. • Standardized bidding announcements according to the contract type.
	Human rights protection training was not conducted for the employees in charge of security	To be applied to the training plan.
Protection of employees' human rights	• There are employees who have died while performing official duties since 2011.	• To analyze the cause of death and create a plan when necessary
Land acquisition and property management	• There is no ground or information on which KR can inspect whether there was any violation of civil petitioner's human rights in the course of use approval and sales processes.	• Added human rights management item (protection of private information) to the property section of compliance checklist.
Construction and supervision management	• There are not enough activities to notify and recommend partner companies about KR's intentions on human rights management.	• Recommended to apply statements related to human rights management in bid announcements. • Regional Offices cooperated on explanation of KR's human rights management related contents to stakeholders and spread of human rights management in construction sites.
Facility management	• There is no specific review process to evaluate stability of railway facilities and identify risk elements in advance.	• Newly established basic additional points for delivery reference (0→3 points) • Increased the reference period (recent 5 yrs. →7 yrs.)

KR Human rights management promotion activities

Human rights management training and spread of human rights management to partner companies

KR spreads the culture that respects human rights and provides training on human rights policies and procedures. As many as 1,748 executives and employees participated in human rights management training in 2019 as a result of promoting human rights management education in each area. KR is also taking the lead in protecting partner companies' human rights by providing customized safety experience education to guarantee their industrial safety, continuous on-site meetings and setting Mutual Respect Day (the 11th of every month), etc.

Human rights management training in each area
- Training for Human Rights Management Working Group (13 persons)
- Itinerant training on workplace harassment for all employees (1,260 persons)
- Training by external human rights experts (222 persons)
- Special training on prevention of sexual harassment and violence for the employees to be promoted to executives (253 persons)

Expansion of human rights management to partner companies
- Customized safety experience training for construction engineers and foreign workers
- Mutual Respect Day (the 11th of every month)
- Meetings with partner companies (54 times)

Human rights management training record (2019)

Workplace harassment prevention training	Sexual harassment and sexual violence prevention training
1.5 hrs. / 1,260 persons	2 hrs. / 253 persons
Human rights training by expert	**Tailored safety experience training (partner company)**
2 hrs. / 222 persons	1 hr. / 1,427 persons

Realization of respect for diversity through social equity based employment

KR does not discriminate among any persons based on gender, education, age, religion, disability, social status or country of origin when hiring employees and tries to achieve social equity by employing persons from various types of the vulnerable class, including disabled persons, veterans, and high school graduates, etc.

KR social equity based recruitment results (rate of social equity recruitment to entire recruitment)

Youth employment 11.8%
- Increased the frequency of new employee recruitment (once → twice)
- Increased the ability to hire the youth by increasing the on-demand recruitment quota (117 persons)
- Expanded the scale of recruitment by improving the recruitment capacity calculation method

Youth intern 5.8%
- Give merit points as stronger incentive to encourage youth participation in internship programs
- Hire more short-term inters as permanent employees (1→5)
- Build capacity by assigning interns to project divisions and providing helpful mentoring

Non-capital regions 52%
- Applicants not required to provide names of schools attended to avoid discrimination based on educational background and/or geographic origins
- Expanded the scope of customized recruitment to increase recruits from non-capital regions (1.5 persons → 6.5 persons)

The disabled 4.7% · Veterans 6.9%
- Increase the frequency of annual employment opportunities for disabled persons (once → twice)
- Created new recruitment process for veterans in collaboration with related government organizations (e.g. Daejeon Regional Office of Patriots and Veterans Affairs)

Human rights relief

KR operates a strong system and reporting channel for prevention of human rights violations. KR provided a foundation on which it will systematically help those whose human rights were violated by establishing the "Guidelines on Prevention of Harassment in the Workplace," and the "Human Rights Violation Relief Process" in 2019 to specifically define requirements and relief procedures for human rights violation. KR also strengthened its response system to human rights violations, such as sexual harassment, sexual violence, unfair work orders, abuse of authority (power abuse), and overdue payment of subcontracted wages by operating online/offline grievance counseling center and reporting channel.

Human rights violation relief process (System and reporting channel)

System and standard	• Establishment of human rights violation relief process and workplace harassment prevention directives, etc. • Application of clauses and specific handling method regarding workplace harassment in collective agreement
Operation of reporting channel	• [Off-line] Operation of sexual harassment and sexual violence grievance consultation center and quarterly joint labor-management conference • [On-line] ZERO Power Abuse Center, e-ZERO Overdue Payment, Human Rights Consultation Center, KR Shinbaram (KR新바람) (employee requests and proposals system) and opening of external power abuse reporting system (Smart Whistle)

Promotion of customized human rights improvement plan

KR is effectively responding to internal human rights issues through customized management of the vulnerable class. KR is striving to practically improve the human rights of the vulnerable class by implementing measures to improve the treatment of high school graduates, indefinite contract workers, female employees and separate job groups. In particular, KR supports education for post-retirement life and acquisition of professional licenses through the separate job group (professional job) system for employees who are about to retire.

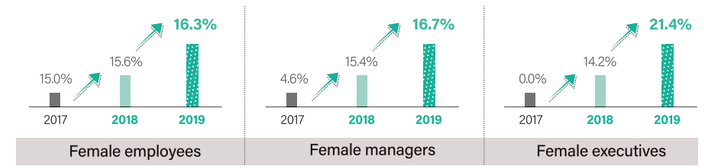
Customized human rights improvement plan and its results

	VOC and request for improvement	Customized solution	Results
High school graduates	• Removal of remuneration gap (in base pay, incentive, etc.) between job rank • Job training and consideration for adaptation	• Pay increase rate that is generous at the start and decreases over time • Reorganization of jobs and duties suitable for high school graduates in consideration of level of job difficulty	• 88% of starting salary for college graduates • Adjustment to mid-to-low level job difficulty
Indefinite contract workers	• Same allowances and incentives as those of regular employees • Improvement of deteriorated work environment	• Newly established holiday incentives and qualification allowance and increased meal subsidy and welfare points • New construction and remodeling of deteriorated facilities	• Raised the actual wage by 10.1% • Level of satisfaction on remuneration rose (45.4 points to 68.1 points)
Women	• Continuous development of female managers • Greater support for childbirth and child raising • Difficult in adapting to work after taking maternal leave	• Gave preferential treatment to women when promoting and selecting employees • Newly established a regulation that gave additional points to the employees whose careers were interrupted • Internalized gender equality into the Executive Recommendation Committee	• Rates of female employees and managers rose for 3 consecutive years • Rate of using flexible work for child raising increased by 29.9%
Professional job group (persons about to retire)	• Low morale due to absence of authority and responsibility • Worried about the post-retirement life	• Job assignment considering job expertise by organizing adequate duties • Support for retirement training (KRW 1~1.5 million)	• Acquired professional license (2 persons) • Support for the second life, such as retirement, business start-up, etc.

2019 Foreign Workers Day event

Safety Guidebook for foreign workers

Rate of female manpower at workplace



Prevention of workplace harassment

Preparation of workplace harassment prevention directives

As the Ministry of Employment and Labor revised the Labor Standards Act in 2019, KR is systematically promoting prevention of workplace harassment by preparing related guidelines and procedures. In addition, KR has formed an internal consensus by conducting the itinerant workplace harassment prevention training for all employees. KR will take the lead in eradicating power abuse and creating workplace, family and social atmosphere where human rights are guaranteed by preventing workplace harassment.

Definition of workplace harassment	The act of inflicting physical and mental pain beyond appropriate scope of work or aggravating the working environment by using the advantage of position, relationship, etc. or by collective conspiracy.
Clarification of type	Nine items, including assault and intimidation against the body and continuous or repeated slander or verbal abuse.
Operation of reporting center and consultants	Operation of on-line and off-line reporting center and separate designation of harassment consultants (2 persons)

Report handling process

KR is quickly responding to workplace harassment incidents in compliance with the incident handling process. KR has prepared a fair operation system which forms the Workplace Harassment Prevention Committee with labor union, and is conducting thorough follow-up management to prevent secondary damage after the initial action is taken.

1	2	3	4	5	6	7
A report is received (on-line / off-line)	**Consultation**	**Investigation is commenced (to be completed within 60 days)**	**Result of investigation is reported**	**The Committee is formed and reviews the case**	**Decisions of the Committee is implemented**	**Monitoring for secondary damage (at lease for 2 years)**

Reinforcement of safety for foreign workers and support for their settlement

KR produces and distributes safety education handbooks that use illustrations and different languages to help foreign workers who have difficulty communicating in Korean language and lack safety awareness better understand safety guidelines. In addition, KR holds annual Foreign Workers Day events in collaboration with related local organizations. The Foreign Workers Day events include various programs, such as free medical treatment, grievance counseling, sports events and networking opportunities, to help foreign workers stably work at the railway construction sites in a more stable manner.

2

KR Sustainable

KR Improving Safety & Eco-friendliness

- SAFE RAILWAY
- ECO-FRIENDLY RAILWAY

Safe Railway

Context

Due to the recent changes in the social environment that value safety and life, KR is also required to assure a high level of safety. Safety is the most important factor that passengers consider when choosing a means of transportation, and thorough safety management and customer confidence are essential for sustainable growth of railway transportation. To this end, it is necessary to systematically manage the accelerated deterioration of railway facilities, prevent safety accidents at railway stations and platforms and cooperate with railway facility operators to promote safety management in the railway transportation sector in all directions.

Our Approach

- Promotion of integrated safety management by working with railway operators
- Assurance of safety for railway construction site workers
- Improvement of deteriorated facilities and reinforcement of response to disaster safety
- Expansion of public safety and convenience facilities in railway stations and platforms

Related SDGs

8 Decent Work and Economic Growth
9 Industry, Innovation and Infrastructure
11 Sustainable Cities and Communities

2019 Key Performance

Government evaluation on level of safety activities

Level A
(the highest level)

Damages from natural disasters

0 case
(for 5 consecutive years)

Railway facility safety rate*

0.329
(0.331 in 2018)

Business site safety management strengthening rate**

35.6
(20.7 in 2018)

Joint operation of regular organization by railway facility manager and railway operators

11 tasks completed

* Number of railway facility accidents / total length of railway
** No of construction site safety facility improvement / total planned amount

Advancement of safety management system

Safety management promotion strategy for zero accident

KR established a mid- to long-term business strategy with the aim of 'implementing the safe railway by establishment of a safety quality-oriented management system' reflecting the public demand for safe railway, and we are pushing forward with 4 strategic directions and 11 implementation tasks to hit our mark. KR will assure the safety of passengers and railway construction workers by preventing railway accidents through systematic safety management based on the mid-to-long-term strategies.

Business goals in the area of safety

Realization of Safe Railway through Establishment of Safety Quality Focused Management System
Construction site disaster rate of 0.210

Strategic direction / **Tasks**

1 Establishment of safety management system	2 Reinforcement of safety management at project sites	3 Retention of expertise in safety management	4 Advancement of quality/environment management
Establishment of safety-first management system	Reinforcement of accident prevention system for railway construction sites	Implementation of customized safety training	Improvement of quality assurance work process focused on prevention
Establishment and operation of safety management support system	Establishment of safety environment for railway construction site workers	Smart safety management using IT technology	Reinforced quality assurance capability
Reinforcement of safety cooperation system between KR and KORAIL	Settlement of voluntary safety culture		Enhancement of quality assurance efficiency

Reinforcement of safety management promotion system

Substantial reinforcement of on-site safety management and safety validation function during early period of project

KR substantially reinforced its safety organization to execute company-wide safety management. All five Regional Offices have established Safety Innovation Divisions which will be dedicated to assurance of site-oriented safety. Safety Innovation Division is in charge of making immediate responses upon outbreak of accident in the operating line in its region and making safety inspections at construction sites. Also, Safety Verification Department in charge of verification of design safety is established to expand design safety verification to all construction works. Safety Verification Department made improvements on 197 cases which posed threat to design safety in 2019.

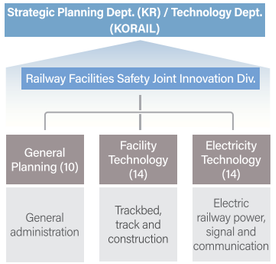
Innovative reinforcement of manpower dedicated to safety management

KR added 127 persons dedicated to safety management to its Head Office and Regional Offices in 2019. The reinforced persons were assigned to areas of: operating line, protection zone and steep slope area safety (79 persons); design verification (17 persons); and safety and health management (31 persons) to assure safety in their respective areas. The reinforcement of safety personnel this time was a groundbreaking increase, reaching 8.6% of KR's quota. KR will meet the public demand for establishment of safe railway network based on reinforced personnel.

Establishment of cooperation system on safety in partnership with railway institutions

As part of the railway safety reinforcement plan, KR is operating 'Railway Facilities Safety Joint Innovation Div.', a joint organization with Korea Railroad Corporation, the railway operator. The Innovation Division is formed by the experts from the two organizations who specialize in trackbed, track, construction, electric railway, signal and communication. The Innovation Division's major activity is to minimize the risk by adjusting the pending and controversial issues arising in each step of design, construction, handover, maintenance, etc. KR will work hard to establish a railway network that the people can use with confidence by further strengthening the cooperation system with the railway operator.

Railway Facilities Safety Joint Innovation Div.



Reinforcement of disaster safety management

Removal of safety blind spot by operation of Railway Facilities Safety Joint Innovation Division

KR is strengthening integrated safety management ranging from railway construction to operation by operating Railway Facilities Safety Joint Innovation Division (hereinafter, "Innovation Division"), a partnership with Korea Railroad Corporation, the railway operator. The Innovation Group operates a virtuous cycle system that shares and jointly analyzes railway accident and failure information in real time and reflects the results of such analysis in design and construction. It also removes the safety blind spots by conducting joint safety inspections, etc. and functions as an inter-agency liason. As small defects can cause serious social disasters such as accidents, KR will continue to remove the safety blind spots through the Innovation Division to eliminate potential safety hazards in advance.

Achievements of Railway Facilities Safety Joint Innovation Division (2019)

Took charge of maintenance handover for opened projects (11 projects)	Conducted joint inspection and discovered facilities that require priority management (Eight cases)	Discussed about who will manage safety for completed facilities (28 locations)	Applied the railway operator's opinion to basic design (14 cases)

Reinforcement of operating line accident recovery support system

KR is reinforcing its cooperation system to quickly respond to an accident in operating line. KR quickly provides manpower and equipment rquired at the recovery site by sharing the current conditions related to diaasters with the operator (KORAIL) through Railway Facilities Safety Joint Innovation Div. on real-time basis. In fact, KR identified the current conditions on real-time basis and provided support in eight cases, including support for soil erosion and restoration of train derailments, caused by landing of Typhoon Mitak (in October 2019), which minimized inconvenience to the people by resuming train operation quickly in the events of disaster.

Introduction of third party verification system to provide the best railway safety

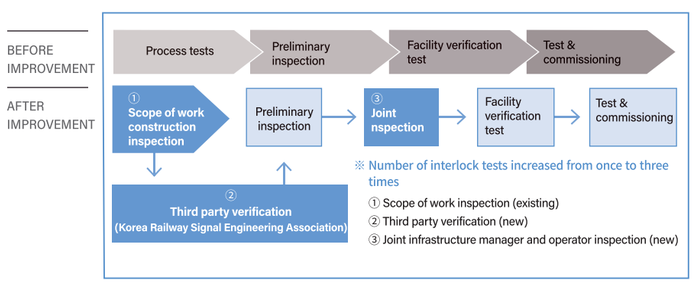
The KR introduces and operates a third party verification system for the signal facilities, the major safety facilities for railway operation, to ensure continued safety of construction-completed railway facilities. The third party verification system is a system in which specialized external institutions verify the adequacy of the results of joint inspection by KR and the operator and conduct a comprehensive functional test. KR will make greater efforts to ensure that the railway can become a safe means of transportation for the public by fully verifying safety at the people's eye-level.

Reinforcement of operating line accident recovery support system

Classification	Current
Identification of accident	• Difficult to recognize accidents on operating line
Support for restoration	• Provision of construction equipment and manpower was delayed due to a delay in understanding the on-site situation
Restoration time	• Took tens of hours to several days * Derailment of Mugunghwa Train at Yulchon Station in Jeolla Line in 2016 (about 20 hours) * KTX derailment at Gangneung Station in 2018 (about 3 days)

Classification	After improvement
Identification of accident	• Accidents are confirmed immediately upon their occurrence and information is shared with the operator.
Support for restoration	• Provided manpower and equipment in nearby construction site to the operator after quickly understanding the current situation of accident
Restoration time	• Reduced restoration time (took about 15 hours) * Derailment of Youngdong Line Bonghwa-Geochon tourist train in 2019

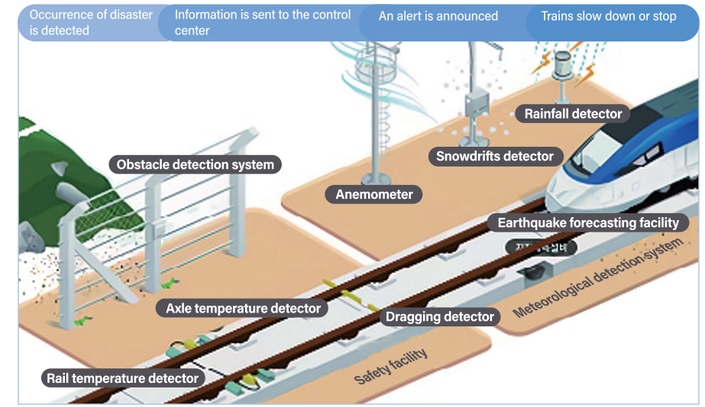
Third party verification



Expansion of IoT-based Railway Safety Facilities

KR has established a train safety system linked to the control center, which remotely monitors the conditions of disasters (heavy snow, earthquake, etc.) and the track on real-time basis. KR is preventing railway accidents caused by earthquake by applying its earthquake monitoring system to 16 locations in the general railway system in 2019, which used to be applied only to the high speed rail. As a single accident can lead to heavy casualties due to the nature of the railway, we will protect the lives of the people from massive natural disasters by adhering to thorough disaster safety management.

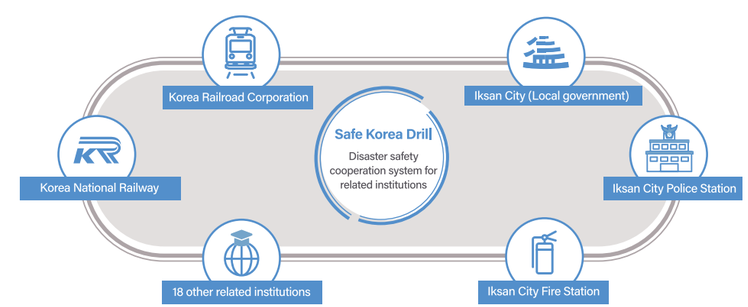
IoT based railway safety facility



Disaster Response, Safe Korea Drill

2019 Disaster Response, Safe Korea Drill

The Safe Korea Drill is a cross-national drill held by Ministry of the Interior and Safety (MOIS) that inspects disaster-response capacity. In 2019, a real-life disaster scenario which combined train derailment and fire caused by a 6.0 magnitude earthquake was created, and the drill was conducted under such scenario. KR established a joint diaster response system by forming a disaster response center consisting of 18 related agencies, including local governments, Korea Railroad Corporation, competent police stations and fire stations, as prescribed by the risk management manual. Through this Drill, we were able to enhance employees' safety awareness and strengthen our cooperative system with related institutions. We will continue to respond thoroughly to the crisis through effective training and cooperation.

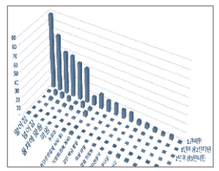


Reinforcement of industrial safety management

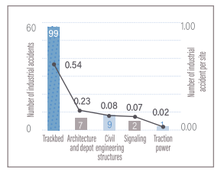
Assurance of safety in early period of project by analyzing industrial accidents → verifying designs → building strategies

KR has analyzed the trend of 452 industrial accidents over the past four years to identify the actual causes of industrial accidents at railway sites in collaboration with Korea Occupational Safety and Health Agency. As a result, we have identified areas in which industrial accidents were concentrated and based on such identification, we are establishing and implementing strategic industrial accident prevention plans. In particular, safety measures are implemented for new workers with high industrial accident risk by selecting target construction works with high risk of industrial accident for intensive management. In addition, practical safety management is implemented to reduce industrial accidents by reflecting various opinions from partner companies and experts.

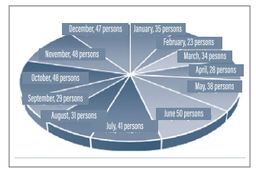
Analysis of industrial accidents in 2015~2018 and promotion of intensive management



Type of accident per period of work (Less than 1 yr.: 88%)



Situation analysis per work type (concentrated in trackbed)



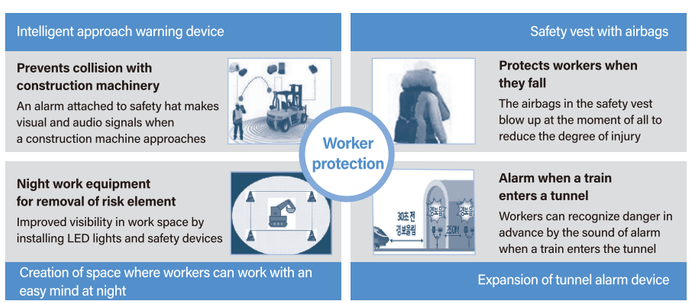
Accidents per season (similar to per month basis)

Inclination analyses result (Target)	Response
Industrial accidents were concentrated to the works of KRW 50 billion or more (about 58%), 60~90% progress and road bed work type	Selected 30 target construction works with industrial accident risk and focused management efforts
New workers with less than 1 year of experience were the cause of 88% of all accidents due to unsafe behavior (rushed descent, jumping, etc.)	Prepared the new worker management plan which includes matching with experienced workers, etc.
New workers with less than 1 year of experience were the cause of about 72% of all industrial disasters related to disease	Managed the workers' health data and applied to job assignment

Establishment of safe railway sites for protection of workers' safety and life

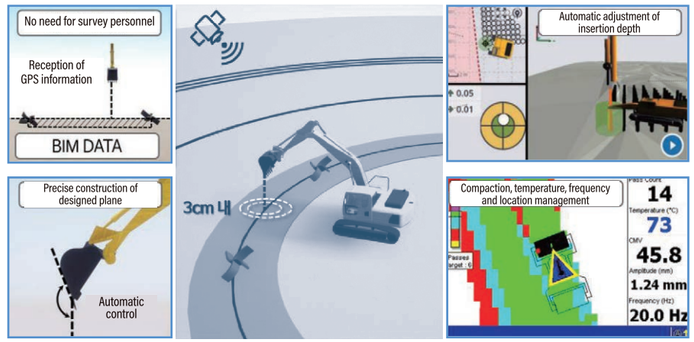
KR strives to providea a safe work environment for its railway site workers. KR has extended the hours of work on the operation line and the facility improvement to help workers perform their jobs with an easy mind. In addition, safety protection equipment for each cause of accident are introduced to create a safe working environment, including: intelligent approach warning system that incorporates IoT technology; tunnel warning system; safety vest with airbag for protection of life in case of falling accidents; and expansion of identification equipment for night work.

Major equipment for worker protection



Expansion of the BIM design technique for prevention of on-site accidents and improvement of railway quality

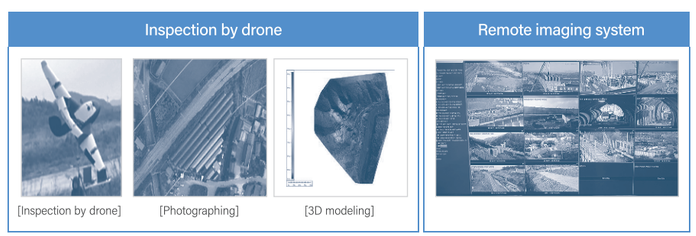
KR is applying the BIM technique to the design on a greater scale to prevent accidents caused by improper location management by and poor operation of construction equipment at the site. Building Information Modeling (BIM) is a technology that produces and manages various information, such as shapes, properties and functions of a facility, based on 3D. This technique greatly contributes to the improvement of railway quality and safety by providing a three-dimensional design for each process and helping to secure sufficient safety workspaces through simulations on the placement of workers near construction equipment. Starting in 2019, we are going to introduce BIM technique to 7 sections in 3 projects, including the Indeokwon⊠Dongtan section, and the design of Gwacheon Station, and will continue to expand the technique in the future.



Realization of safe site management using the smart technology, such as inspection by drones

KR conducts drone inspections on the slope of operating line, the railway protection zone, and the lower part of the bridge over the water, which cannot be approached by workers. In particular, by introducing drone inspections in the railway protection zone (within 30m of the railway boundary), extensive inspection of more than 10km per day became possible, and the risk of collision with train when the safety personnel personally conducts inspection was solved. In addition, 66 new remote imaging systems were installed in construction hazard areas, steep slopes and railway protection zones to strengthen accident prevention and on-site management.

Drone and remote imaging system



Introduction of virtual reality (VR) safety training

KR is continuing to improve safety awareness by developing hands-on safety training contents in five areas with high accident frequency at the site (fall, collision, dropped materials, electric shock and contact). In particular, KR introduced and operated training by VR equipment of which contents resembling the actual construction sites were presented in virtual reality. This training method provides hands-on safety and prevention training that reflects characteristics of railway to on-site workers beyond the existing methods of presentation decks and videos. In the future, we will continue to develop various safety training programs that incorporate new technologies to practically enhance workers' safety awareness.

Screens from the VR training

Explanation by a co-worker

Occurrence of an accident

Understanding the cause of accident

Reinforced public safety and convenience by improving railway facilities

Preemptive improvement of deteriorated facilities by securing a budget increased by 42% (the largest increase in history)

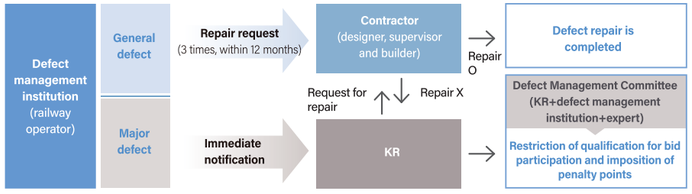
As the public became more interested in safety, KR has secured a budget of KRW 922.3 billion (increased by 42% year-on-year) for facility improvement in 2019, up by 42% year-on-year. The secured budget was used to improve deteriorated facilities (KRW 494.8 billion), expand safety facilities (KRW 216.8 billion) and improve passenger convenience facilities (KRW 210.7 billion). As a result, KR over-achieved the railway facility improvement rate for 2019 by 32% in 2019. In the future, we will do our best to create a safe and convenient railway environment by gradually increasing the amount of investment in facility improvement projects.

Over-achieved the railway facility improvement goal by 32% compared to that of KR 2025 Mid-to-long-term Management Strategy

Improvement of deteriorated facilities	Expansion of safety facility	Performance advancement	Improvement of passenger convenience facilities
5,047 actual locations compared to 3,935 targeted locations (including construction of Geumjung Substation, etc.)	636 actual locations (118%) compared to 541 targeted locations (including seismic reinforcement of Guro elevated railway bridge (upper and lower)	73 actual locations compared to 96 targeted locations (including improvement of Gyeongin Line Anchooncheon Bridge, etc.)	384 actual locations compared to 91 targeted locations (including improvement of facilities in Hankuk Univ. of Foreign Studies Station, etc.)

Establishment of concentrated management processes for major defects

KR is making efforts to minimize inconveniences of the people by completing the railway facility defect repair on time. In particular, KR started to operate 'the defect management committee,' a comprehensive decision-making organization for defect repair from 2019 to quickly and accurately establish the repair plan for major defects and long-delayed defects. KR is also encouraging the contractors to actively respond to the defect repair requests by strengthening its sanctions against poorly performing constractors, such as prohibiting them from participaing in bids and imposing penalty points. By such efforts of KR, the number of facilities subject to long-delayed defect repair decreased by 30% in 2019 in year-on-year basis. KR will provide safe and convenient railway service to the people by actively repairing defects.

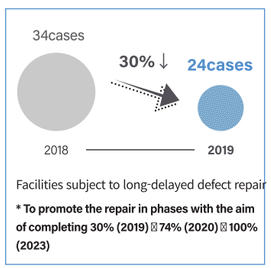


Establishment of KR RAFIS for railway facility life cycle management

KR is establishing 'KR RAFIS', a comprehensive railway facility management system, to systematically manage railway facilities and efficiently improve them. KR RAFIS (Rail Facilities Information & History System) is designed to improve and maintain facilities at the optimum time at the minimum cost by systematically managing history of facilities according to their life cycle. With 'KR RAFIS,' of which implementation will be completed in 2020, KR will manage the railway facilities more efficiently and provide a safer railway service to the people.

Railway Facility DB	• Railway Facility Data Management Using Smartphones • [Pilot project] Honam HSR Gongju Facility and Electricity Project (June) • [Expected outcomes] Management of maintenance record and current status statistics
Establishment of GIS	• [Improvement] Degree of facility deterioration expressed in coordinates • [Pilot project] HSR lines (Gyeongbu HSR and Honam HSR) and conventional lines (Gyeonggang Line and Gyeongjeon Line) • [Expected outcomes] Build spatial information DB, link with IoT technology
Facility Classifiction Standardization	• [Unified classification system] Adopt unified classification using identical hierarchical structure for all railway facilities and creation LoI (Level of Information) • [Unified work types] Unify maintenance activities into an identical system and identify and code activity units

Promotion of long-delayed defect repair

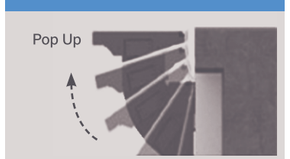


Passenger-oriented expansion of safety facilities

KR is expanding safety facilities so that people can use railways more conveniently and safely. To prevent accidents on platforms, we reinforced safety steps and safety fences to prevent unauthorized entry into tracks. To prevent collision with train in road crossings, we have expanded safety facilities at road crossings and separated railways and roads. In addition, we are improving the convenience of railway use by the transportation vulnerable by designing railway stations and improving the railway station facilities based on BF (Barrier Free, a facility that has no barrier against the transportation vulnerable) certification.

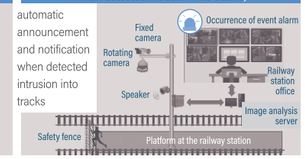
Safety facilities on the platforms

Installation of safety steps on the platforms



Improved safety fences

Improved CCTV system (automatic announcement and notification when detected intrusion into tracks)



Safety facility at road crossing

Separated crossings

- Removed the possibility of accidents at road crossings from the source by separating tracks and roads where possible
- Separation of road crossings at Gwanchok, Nundeul, Sochon and Seokwha

Driver alarm facility

Standardized alarms and electric crossing gates and improved signals at 451 locations

Driver safety facility

Expanded road crossing where separation is structurally impossible
- Increased width of road crossing and secured pedestrian path

- Detection of risk elements by improving impediment detection sensor at road crossing section
- Improved the sensors into zone detection type sensors

Improvement of railway station in consideration of the transportation vulnerables

Large scale extension and reconstruction

Extended the BF (Barrier Free) certificate for railway station by promoting large scale extension, reconstruction and improvement in every 5 years considering degree of deterioration and volume of users

Dujeong Station

Improved convenience of about 12,000 daily average users by building the North Station Building

Jeonju Station

Secured spaces for amenities and reduced the distance of transfer to bus by building the new railway station building

Cheonan Station

Secured significant amounts of amenities and rest areas by extending the railway station building by about 3,000㎡

Small scale facility improvement

- Improved amenities in selected railway stations with high volume of users
- Elevators, escalators, etc. at 127 locations
- Waiting rooms on platforms (35 stations), toilets for the disabled (2 stations) and breast-feeding rooms (2 stations)

Expanded the facilities to prevent accidents by natural disaster

Disaster

Heatwave	Earthquake	Heavy snow	Heavy rain
Risk of derailment by heat wave	Risk of large-scale damage, such as train overturn, etc.	Risks of malfunction and derailment when switch point is frozen	Tracks can be flooded by local heavy rain and falling-rock accident can occur by typhoon

Countermeasure

Waiting rooms on platforms

Increased the number of waiting rooms on platforms in metropolitan railway sections to prepare for extreme heat (17 locations in 2019)

Prevention of derailment

Stronger inspection

Inspection of execution to prepare for extreme heat

Technology development

Rail temperature monitoring system

System reinforcement

Establishment of standards on trace safety

Earthquake-proof reinforcement

- [1st and 2nd] Evaluated earthquake-proof performance at 902 locations on high-speed and general railways and completed reinforcement at 613 locations
- [3rd] Earthquake-proof performance test in progress for 200m^2 or larger facilities (1,251 locations)

Heating system

Installed heating devices (hot wire) in switch points at 128 locations

Preventative facilities

Bridge expansion	10 locations
Retaining walls installed	22 locations
Prevention curtain and fence	11 locations
Drains	27 locations

Eco-friendly Railway

Context

Recently, the concept of the Anthropocene which emphasizes humanity's responsibility for deterioration of the global environment, such as ultrafine dust and climate change, has emerged. Also, cross-national response to climate change is required to ensure the environmental rights of future generations, so that we can move toward a sustainable society. To this end, healthy economic growth in which ecological principles are respected in energy, industry, production, and consumption should be achieved through implementation of environmental policies and development of eco-friendly new technologies that will allow people to enjoy abundant environmental benefits.

Our Approach

- Respond to climate change by leading the efforts on reduction of greenhouse gas emission
- Ensure the environmental rights of workers and passengers by reducing find dust
- Develop eco-friendly technology for green growth
- Restore ecosystem by using the railway assets in eco-friendly way

Related SDGs

2019 Key Performance

Greenhouse gas emission reduction rate

33.7%
(29% in 2018)

Rate of green product purchase

87.1%
(73.3 in 2018)

Rate of achieving targeted zero-energy building class

100%

Environmental management index*

378.4
(355.6 in 2018)

The excellent organization for greenhouse gas reduction

Received the Minister's Award from MOE

* Calculated by multiplying performance result per 11 environmental management standards by individual weight according to KR's Environmental Management System

ISO 14001 Certificate

bsi.

Certificate of Registration

ENVIRONMENTAL MANAGEMENT SYSTEM - ISO 14001:2015

This is to certify that:
Korea Rail Network Authority
Wonju Headquarters
Chang-ri
Gangsan-ri
Wonju-si
Republic of Korea

Holds Certificate No:
EMS 595630

and operates an Environmental Management System which complies with the requirements of ISO 14001:2015 for the following scope:

The project management, design and construction supervision, commissioning, procurement and inspection of railway and off-network construction projects, manufacture of CRH5(Construction Related Rail) and facilities maintenance.

For and on behalf of BSI:
Steve Cheney, Head of Compliance & Risk - Asia Pacific

Original Registration Date: 2009-07-03
Latest Revision Date: 2019-05-22
Effective Date: 2019-05-24
Expiry Date: 2022-05-23
Page: 1 of 1

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Establishment of promotion system for reinforcement of environmental management

KR has established an environmental management promotion system, keeping pace with the international community's efforts to cope with climate change and the government's energy policy. This promotion system is based on ISO 14001, the international standard for environmental management, and is a system designed to build more eco-friendly railways by thorough management of railway sites, including the areas of trackbeds, tracks and construction. KR operated the environmental management promotion system with its partner companies and achieved 378.38 points (102.3% of the target) in environmental management index and 33.72% of the greenhouse gas reduction rate (120.43% of the target) in 2019.

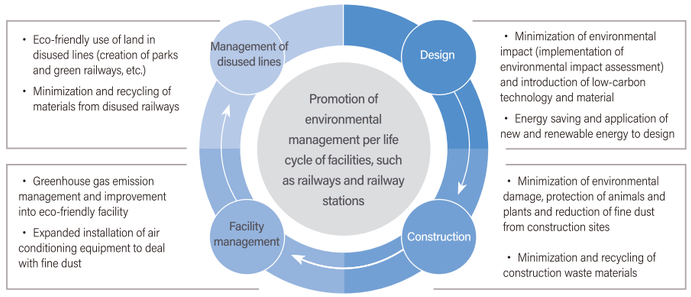
Foundation for promotion of environmental management and target of environmental management

Foundation for promotion of environmental management

Promotion organization	Management standard
Head Office (Quality Management Div.), Regional Offices, Supervision Div. prime contractors and subcontractors	Environmental laws and regulations, KR regulations, quality environment safety, management plan and environmental management plan

Target of environmental management and factors

Target of management	Factors of management
Total 408 site locations, including trackbed (105), track (29), construction (34), electricity (71), signaling (33), telecommunications (41) and upgrading (95)	11 areas, including environmental impact assessment and greenhouse gas reduction



Evaluation and feedback

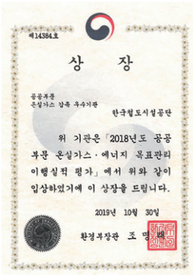
Check	Monitoring (monthly, quarterly, semi-annual and annual) and feedback
Management plan	Achievement of government recommendations, formulation and implementation of annual goals

Major achievements

Environmental management index
Achieved 378.38 points
(exceeded the target (370.0) by 2.3%)

Greenhouse gas emission reduction rate
33.72%
(exceeded the target (28%) by 20.43%)

Ministerial Award from MOE_ Excellent Institution on Greenhouse Gas Reduction



Responding to climate change

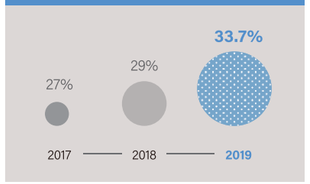
Leading the efforts on reduction of greenhouse gas emission to respond to climate change

In the wake of the new climate system, KR is establishing and implementing a greenhouse gas emission reduction plan to cope with climate change, including global warming. We are forming consensus through 'the Greenhouse Gas and Energy Conservation Promotion Committee' in which all parts of the company participate and strengthening our promotion of energy conservation by applying the greenhouse gas reduction performance to the evaluation. We are also promoting execution plans, including supply of LED lights, automatic building lights-off system and operation of PV power generation facilities in the parking lots at Head Office, that can maximize energy saving efficiency. As a result, we over achieved our greenhouse gas emission reduction goal in the public sector in 2019, was selected as an 'excellent public institution for greenhouse gas reduction' and won the Minister's Award from Ministry of Environment.

Result of greenhouse gas emission reduction efforts

	Greenhouse gas	LED light installation	Use of eco-friendly vehicles
Target (%)	28.0	90.0	70.0
Actual (%)	33.7	92.6	85.7
Achievement rate(%)	120.4	122.4	122.4

Yearly greenhouse gas emission reduction rate

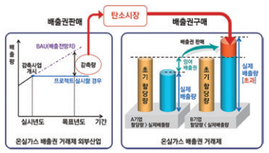


Received an approval for the Greenhouse Gas Emissions Trading System Reduction Project for the first time in transportation sector in Korea

KR registered its greenhouse gas emission calculation methodology (CDM, Clean Developent Mechanism) of the high speed rail with United Nations Framework Convention on Climate Change (UNFCCC) for the first time in the world to convert the Modal Shift* created by construction of Honam HSR into carbon emission right and secured feasibility for approval of the reduction project after continuously discussing with relevant institutions and supplementing its methodology. KR's reduction of annual greenhouse gas emission by 240,000 tons was recognized, and the Greenhouse Gas Emissions Trading System Reduction Project was approved in the area of transportation for the first time in Korea. We will make efforts to strengthen the role of railway, the eco-friendly mode of transportation, by expanding the Reduction Project to other railway construction projects.

*** Modal Shift:** Shifting the mode of transportation to railway/maritime transportation, which are eco-friendly modes of transportation that emits less carbon dioxide than the road transportation, to achieve a groundbradking reduction of greenhouse gas emission.

Emission Trading Scheme - outsourced project



Expected effects of the Greenhouse Gas Emissions Trading System Reduction Project

Reduction of greenhouse gas (annual)
240,000 tons

Expansion to other railway construction projects to drastically reduce greenhouse gas emission

Generation of maximum
KRW 72 billion
profit in the next 10 years

Execution of joint hydrogen fuel cell development agreement

Joint development of eco-friendly energy

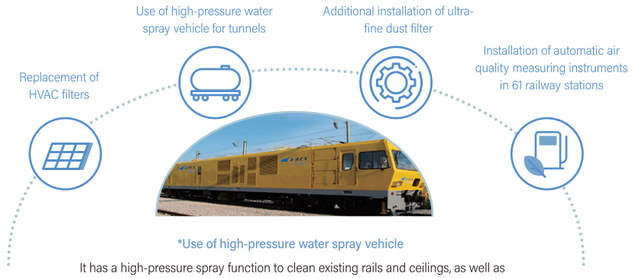
KR is actively participating in joint eco-friendly energy development projects by working with other institutions. We have signed an agreement with Korea Western Power to provide (former) Gunpo Substation (in Gyeonggi-do) site that is scheduled to be demolished as a part of the deteriorated substation improvement project, while Korea Western Power is to invest about KRW 62 billion in the project to build a 10MW hydrogen fuel cell power plant. The hydrogen fuel cell power plant will be able to supply power to about 3,300 households living near the plant from 2021, and it will also contribute to the creation of jobs for about 630 people and the revitalization of the local economy. In addition, we are promoting projects to expand PV power generation facilities by working with Korea Midland Power at four locations in Janghang Line including the roof groove of the Deokha Depot. KR will continue to expand cooperation with related institutions so that railway can contribute to revitalization of new and renewable energy business.

Improvement of people's environmental rights

Efforts on reduction of fine dust

As highly concentrated fine dust that continues every year is counted as a cause of social disaster, the government is also implementing strong policies on the issue, such as establishing a standard for ultra-fine dust concentration in 2019. In line with such trend, KR has selected 61 underground railway stations and 178 railway construction sites that are likely to generate fine dust as its main management targets and implemented measures to reduce fine dust. A total of KRW 81.6 billion will be invested by 2020 and we will strive to achieve practical fine dust reduction effect so that we can protect the health of the people who use railways and railway stations and the on-site workers.

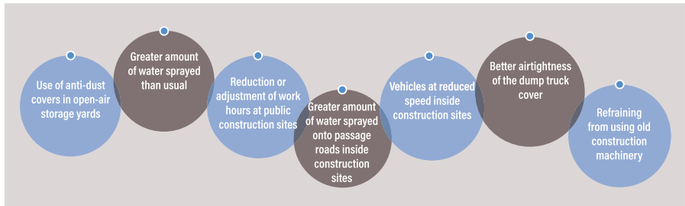
Reduction of fine dust in underground railway stations and tunnels



*Use of high-pressure water spray vehicle

It has a high-pressure spray function to clean existing rails and ceilings, as well as dust absorption function which improves air quality and effectively remove dust. With the introduction of high-pressure spray vehicle, fine dust in tunnels can be reduced up to 11.5%.

Emergency reduction of fine dust in construction sites

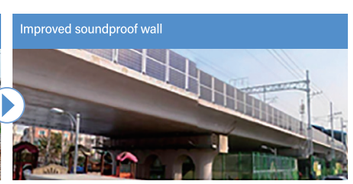


Expansion of eco-friendly facility and less noise by PV soundproof walls

KR is reducing noise from the operating lines and expanding eco-friendly facilities by installing PV soundproof walls in 32 locations, including 15 locations in the capital region, 8 locations in Yeongnam region and 9 locations in Honam and Chungcheong regions. Also, by installing eco-friendly PV soundproofing boards on the soundproof walls, we have created a new business in which a private business sells electricity to power generation company by generating renewable energy. In the future, we will install PV soundproof walls sequentially in the areas where the noise exceeds standards, to expand renewable energy and relieve noise inconvenience for residents around railways.

Ordinary and PV soundproof walls

Ordinary soundproof wall


Improved soundproof wall

Seohae Line Railway Station 106

Development of eco-friendly technology

Implementation of zero-energy railway station technology

KR is promoting the implementation of zero-energy railway station in line with the mandate on zero-energy in the public sector and the '2030 New Energy Industry Proliferation Strategy'. In 2019, KR established the standards for railway station design, selected the Seohae Line Railway Station 106 for a pilot project, and implemented the zero-energy railway station design to which a 33% new and renewable energy, such as geothermal and solar energy, supply ratio was applied. (the supply rate mandated to the public sector was 27%.) Through these efforts, KR was able to obtain the Zero Energy Certificate from the Korea Energy Agency. KR will expand the zero energy railway stations to all its projects by using Seohae Line Railway Station 106 as an excellent model.

PASSIVE	+	ACTIVE	▶	Basic direction of zero energy
Minimization of energy use for cooling and heating (reinforcement of heat insulation performance, etc.)		Generation of new and renewable energy (PV, geothermal, etc.) Zero energy building		

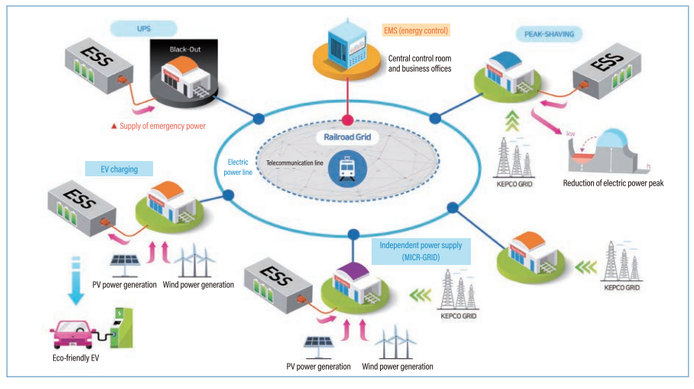
Basic direction of zero energy

Energy saving	High efficiency facility	New and renewable energy	Monitoring
High-efficiency insulation system Maximized the performance of outer cover by using top-performance insulators	**LED lights** Reduced energy consumption by using long-life and low-voltage LED lights	**Geothermal heating and cooling** eating and cooling using ground heat	**BEMS** Monitors energy consumption details
High-performance windows and doors Minimized heat loss through windows and doors	**High-efficiency facility system** Improved cooling and heating efficiencies by using high-efficiency facility system	**PV power generation** Uses solar energy to produce electricity	**Remote metering electronic meter** Measures the amount of energy consumption
Minimized heat loss through windows and doors Reduced energy consumption for cooling			

Use of Energy Storage System (ESS) technology

KR is considering the introduction of ESS to maximize the use of new and renewable energy by railway industry. ESS is a technology that allows us to store electricity generated by new and renewable energy, such as PV, to prevent black out (massive power outage) and reduce electric power peak. KR is going to introduce ESS to two railway stations in the Donghae Line for demonstration purpose and eventually install ESS in all railway stations in the future. KR will continue to introduce eco-friendly convergence technologies to create new growth engines for the railway industry and actively respond to climate change.

Concept of Energy Storage System



Efforts on preservation of environment

Protection of the ecosystem

KR is strengthening its effots to preserve environment by using the disused railwas, to respond to climate change. The disused railways created by construction, improvement or relocation generate large volume of waste materials and may turn into unpleasant facilities in their regions. Thus, KR is promoting eco-friendly projects using the existing disused railways by working with local governments. The project utilizing abandoned disused railway land for eco-friendly purposes not only reduces waste generation drastically, but also can create ecological forests and parks to restore the local natural ecosystem and create tourism projects to revitalize the local economy.

Eco-friendly projects using disused railway land

Prevention of waste materials (by use of existing railway track)	Vitalization of local area (tourism business and job creation)	Restoration of ecosystem (green railway, etc.)

Eco-friendly idle land utilization project (2019~May 2020)

(Former) Gyeongchoon Line site	
Project name	Gyeongchoon Line Forest Path (collaboration with Seoul Metropolitan Govt.)
Area	Length: 6.3km (Gwangwoon Univ. Station~Seoul Metropolitan City boundary)
Project period	2013-May 2020 (collaboration with Seoul Metropolitan Govt.) Sequential opening of sections 1~3
Project description	Section 1: Garden filled with local species of trees Section 2: Space for meeting and communication (café street) Section 3: Green railway and walking trail

(Former) Donghae Nambu Line site	
Project name	Green Railway (collaboration with Busan Metropolitan Govt.)
Area	Length: 9.8km (in Haewoondae-gu, Busan)
Project period	2012~2019 (collaboration with Busan Metropolitan Govt.)
Project description	Walking/jogging trail, observatory, rest area, green space, etc.

Seokjung Tunnel 2 (a disused tunnel on Gyeongjeon Line)	
Project name	Gwangyang Eco Park (collaboration with Gwangyang City)
Area	Length: 290m, height: 6.5m (in Gwangyang, Jeollanam-do)
Project period	2018~2019
Project description	Five experience zones, including eco media zone and fossil experience zone Local tourist destination linked to Gwangyang Wine Cave (opened in Aug. 2017 using the disused tunnel)

KR Planting Trees of Hope event

KR Planting Trees of Hope event

KR conducts tree-planting activities in conjunction with local governments and the Korea Forest Service every year. KR has been planting about 20,000 trees since it signed the 'People' Forest Agreement' with the Central Regional Office of National Forest Service in 2007. '2019 Planting Trees of Hope' event took place in Youngdong Geumganmochi Village, where KR entered into a 1 company, 1 village relationship. At this event, KR engaged in local community environment clean-up activity along with the villagers by planting 1,500 trees and removing dead trees in the driveways and forests of Dulegil. KR will continue to expand eco-friendly social contribution activities by working together with the local community.

3

KR Sustainable

KR, GROWING CONTINUOUSLY

- EXPANSION OF GLOBAL BUSINESS
- REINFORCED RAILWAY R&D
- ENHANCED RAILWAY ASSETS VALUE

Expansion of Global Business

- KR is actively entering the global railway market using its capabilities and know-hows it acquired while promoting railway construction and facility management projects in Korea. KR has won 69 railway projects in 21 countries by 2019.
In the future, KR will contribute to the development of railway industry and the vitalization of economy in Korea by working together with Korean mid-to-small and mid-sized companies for joint expansions into overseas railway markets.

RELATED SDGs

Training where KR invited representatives from multiple nations

Railway School in Egypt

Training where KR invited high-ranking public officers from India

Reinforcement of strategic overseas business

Establishment of overseas expansion strategy to strengthen competitiveness in global railway market

KR has been making steady efforts to win orders from the international railway market where competition is intensifying, as it responded quickly to the environmental changes. In particular, in 2019, we established a new business strategy by clearly analyzing our advantages and weaknesses in overseas railway projects and established a customized strategic road map for each country where we intended to win businesses from. In addition, we reorganized the business areas of the International Business Department, which had been focused on management of the businesses won, focusing on acting in local areas to win businesses. KR is striving to grow into a regional hub that drives the overseas expansion of the Korean railway industry by training regional experts and strengthening local networks. Based on these efforts, we have achieved meaningful results in various areas, including winning a large-scale project worth KRW 18.3 billion in Indonesia and entering the Latin American market for the first time in Korea.

2025 Mid-to-long-term Management Strateg_yInternational Business

International business goals

Increase the value of overseas projects awarded and participate in both government funded and PPP projects
KRW 350 billion in accumulated amount of orders won from overseas business and 2 newly won finance and PPP projects

Strategies	1 Diversify overseas projects and explore new markets	2 Create healty ecosystem for stimulated overseas projects	3 Stronger publicness through public-private cooperation
Tasks	Formulate hub & spoke based project winning strategy	Capacity building in preparing winning proposals and secure highly qualified experts	Support private companies in innovating successful bidding strategies
	Select seven key target countries and devise customized master plans	Creating finance procurement and investment environment for PPP projects	Stronger cooperation between KR and private companies
	Gain entry to new markets in Central Asia and Middle East	Prepare systematic foundation for sustainable overseas project performance	
	Participate in government funded and PPP projects in key target countries		

Stage-by-stage networking program to successfully bid for overseas projects

It is very important to establish a relationship of trust with the ordering organization, and systematic networking activities are essential as it takes a long time from the bidding announcement stage to the final contract winning stage. KR divided the contract winning activities into three stages: the project discovery stage; the project development stage; and the contract winning stage, and operates a customized networking program for each stage. We have established personal networks by promoting the Korean railway technology through training sessions which invited government officials and local railway schools. Also, we are accurately understanding the needs of ordering organizations and strengthening relationship with them through regular exchanges with high-ranking government officials and executives of ordering organizations. In addition, we further expanded our networking base through international seminars and exchange events such as the Global Infrastructure Cooperative Conference (GICC) and the East Asian Railway Community. Through these active personal exchange activities, we were able to win six overseas projects worth KRW 27.7 billion in 2019.

	Identification of new projects	Project development	Nearing project tendering
EXAMPLE	Creation of new network (focused on potential countries)	Expansion and fortification of network with governments and ordering organizations	Reinforcement of networking with high-ranking personnel
EXAMPLE	Training where KR invited representatives from multiple nations (Aug.~Sept. 2020) – 20 persons from 9 countries	Local training per country (Railway School) – Mongolia, Vietnam, Egypt, etc.	Training where KR invited high-ranking public officers – 8 employees from Indian government institutions and ordering organization (May)

Regional hub strategy

Organization of KR's manpower (Dec. 2019)
Personnel reassignment
(railway engineers → marketing experts)

▼

Build stronger local network (2020)
Assign highly capable personnel to foreign branch/project offices (engineers with good command of relevant language)

▼

Regional hubs (2021~)
Enlarge foreign branch/project offices in a country when contract is awarded

Implementation of collaborated strategic project winning activities for key target countries

KR is reinforcing its overseas railway business competitiveness by diversifying the target countries and business areas. We are engaging in systematic contract winning activities systematically by selecting target countries to focus our activities and building master plans for each country. We are actively entering the global railway market through various methods of cooperative activities such as cooperation with domestic small companies with strong technical skills, strategic alliance with local leading companies and MOU signing with the ordering organization.

Strategic project winning activities for each country

Indonesia	Expansion of South Asian market (Winning contracts for large railway project follow-up stages)	- Won the trust of ordering organizations by successfully completing existing projects - Strengthened strategic alliances through continued network with the ordering organization → Won the Jakarta LRT 2nd Phase PMC service contract
Costa Rica	Pioneered the new market for the first time (New expansion into Costa Rica)	- The team dedicated to contract winning in Latin America engaged in local activities (participation in international forums in three countries, etc.) - Conducted on-site survey in collaboration with governmental and international institutions → won contract for Costa Rica wide-area passenger railway PM consulting service
Turkey	Pioneered the new business area (First engagement in large PPP project)	- Organized Team Railway Korea considering the characteristics of public-private cooperation project - Actively participated in the project from the business model creation stage and strategically discussed with the ordering organization → Entered into the high-speed rail participation and cooperation MOU with Turkish railway authority (ordering organization)

Supported private companies in their overseas expansion

Actively carried out the role of a bridge for the private sector companies to expand into overseas markets

KR is carrying out the role of platform that promotes Korean railway businesses to globally expand. We are helping SMEs that are unable to enter overseas railway markets (which are focused on medium and large-sized projects) by themselves to easily obtain international certification for railway products; lowering the entry barrier against SMEs and helping them to secure export sales channels by actively using excellent products from SMEs at our project sites. In addition, we have formed a joint investigation team with private companies to conduct business feasibility studies and risk surveys, to become a guide for development of new markets. KR will continue to take the lead in creating an ecosystem for overseas expansion where we grow together with through joint expansion with SMEs

Efforts on winning public-private cooperation projects by forming Team Korea led by KR

KR is strengthening cooperation with private companies further in line with the increasing number of orders for large-scale public-private cooperation projects in the overseas railway market. In 2019, KR formed Team Korea to participate in the Halkali&Gebze HSR PPP project (PPP project) in Turkey, a project worth KRW 5 trillion, and we are constantly on the move to find the best business model. In 2019, the feasibility study was completed through cooperation with a government institution (KIND), and we plan to prepare reasonable business promotion plans and strategically carry out contract winning activities based on the results of the study. KR will continue to strengthen the global competitiveness of the Korean railroad industry by applying this Team Korea approach to various PPP project contract-winning activities.

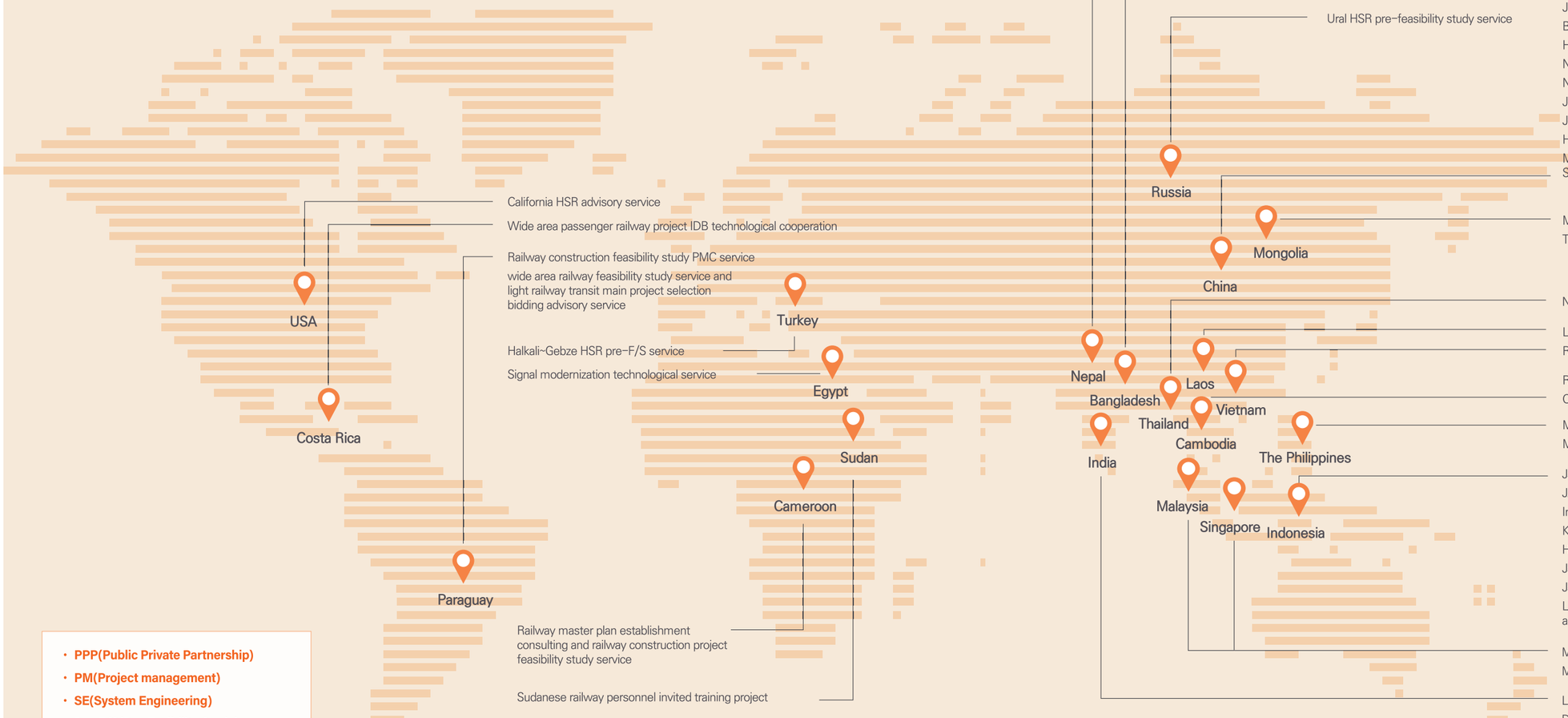
Organization of Team Korea for HSR project in Turkey

Leading Team Korea (2020)	Team Korea activity (2021)	Global Consortium (planned)
Business development stage	Before announcement of RFP	After announcement of RFP
- KR Formed project promotion group - Preliminary feasibility study (July~November) - Discussed about the best business model (Dec.)	- Kick-off meeting for Public-Private Joint Project Promotion Group (headed by the Vice Chairman of KR) - Main feasibility study was carried out	- A Turkish construction company joined - Finalized construction and financial investment - Prepared a preemptive proposal

Overseas projects awarded

Since establishment of KR **21** countries — **69** projects — **3,248** billion

KRW 100.6 billion for KR



- PPP(Public Private Partnership)
- PM(Project management)
- SE(System Engineering)
- Pre-F/S(Pre-Fesibility Study)
- F/S(Fesibility Study)
- PMC(Project Management Consulting)
- MRT(Mass Rapid Transit)
- LRT(Light Rail Transit)

Intensified Railway R&D

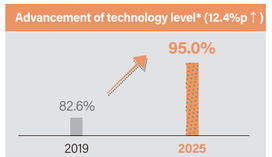
- KR is strengthening its future growth engine to gear up for the future by development leading technologies for the 4th Industrial Revolution. We are working together with small and medium sized engineering firms of Korea on new technology R&Ds that will boost the growth of railway industry for everyone. As the industry leader at the center of Korea's railway industry, KR will take the initiative to promote industries for innovative growth with aim to boosting the country's rail technology competitiveness and job creation.

RELATED SDGs

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

11 SUSTAINABLE CITIES AND COMMUNITIES

Strategic goal for technology level



* Technology level

Korea's railway technology level compared to top ranking countries (Korea Agency for Infrastructure Technology Advancement)

Countries with railway test track exceeding 200 km/h

① China ② Russia ③ Czech Republic ④ USA ⑤ Korea

- Comprehensive Railway Testing Track

Location	Osong, Chungcheongbuk-do
Length	12,990km
Construction	2012 to March 2019
Key infrastructures	9 bridges (1.5 km), 6 tunnels (4.2 km), at-grade sections (7.3 km), total track length (16.075 km), maximum speed (250 km/h)
Performance verification tests	198 items
Test types	447 types

Development of next-generation Korean-style railway technology

Futuristic railway technology development strategy

KR is strengthening its competitiveness in overseas railway markets by developing its own core technologies that will be in step with the 4th Industrial Revolution. We are formulating and implementing strategies to development Korea's own technologies for railway's core components – catenary system, signaling, telecommunications, and tracks – minimize dependence on imported technoloties. Such efforsts and technologies will help KR to bolster Korea's railway industry and serve as the basis for providing save and convenient railway to the people.

2025 mid/long-term railway technology development strategy

Safety goals: **Achieve technology advancement for safe and fast rail network in Korean peninsula** that is 83% electrified with average speed of 191 km/h, equivalent to global technology level of 95%.

Strategic direction	1 Speed enhancement	2 Advancement of five innovative technologies (HI-FIVE+)	3 Enhanced safety of railway operations	4 Equipped with engine for innovative growth
Tasks	Increase electrification rate	Expand installation of Korea railway signaling system	Install more safety facilities	Strength R&D for innovative growth
	Expand installation of high speed signaling system	Expand installation of LTE-R	Promote advancement of railway traffic control system	Ensure fairness, transparency and co-prosperity
	Expand installation of high speed track system	Wider application of Korean rail fastening system	Efficient allocation of track access rights	Human resources development in railway engineering
		Strengthen R&D of 5 innovative technologies	Modify safety design and safety related regulations	

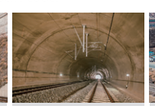
World's 5th comprehensive railway test track provides foundation for innovative growth

Railway is a complex system working through various technologies that are closely interrelated. This makes it absolutely necessary for product safety to be verified after technology development and before commercialization. Korea's railway test track, completed in March 2019, is equipped with facilities to carry out performance test of all different railway components – track, trackbed, catenary sytem, singaling, and railway telecommunications. Furthermore, having a railway test track in the country, has made not only efficient performance verification possible but supplement any problems almost immediately after its identification. In 2019, the test track undertook performance verification of 512 double-decker passenger coaches manufactured by a Korean company. The comprehensive railway test track is on the way to making significant contributions to advancement of Korea's railway technologies and their exports.

Comprehensive Railway Test Track can test:

Bridge test-bed

Ride comfort and vibration


Catenary system

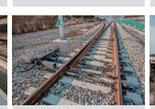
Driving stability test

Soundproof/sound aborbing wall test-bed

Gradient restart

Braking performance

Concrete slab tracks


Turnouts

Traction transformers

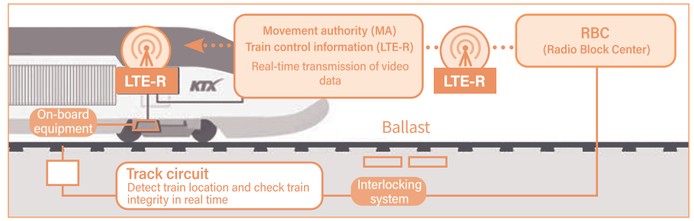
HSR speeds in other countries (2019)

China	350km/h
France	320km/h
Japan	320km/h
Korea and major European countries	**300km/h**

Introduction of Korean train control system based on 4th generation mobile communication technology

KR introduced a train control system that is based on 4th generation ultra-fast mobile communication technology by combining the Korean developed train control system (KTCS-2) and LTE-R (Long-Term Evolution, integrated wireless network) technologies. This technology transmits train control and signal data in real-time through the ultra-fast wireless communication network. By connecting the train, the traffic control center, the maintenance personnel, and the raiiway operator through the ultra-fast wireless communication network, this tecnology will significantly improve efficiency of railway operation and prompt emergency response. KTCS-2 has been installed on 180-km Iksan-Yeosu Expo section of Jeolla Line since 2019 as a pilot project befoe the technology is commercialized. When commuercialized in the future, we expect to increase rail transport capacity by 16%, save construction and maintenance costs by KRW 1.8 trillion, and have import substitution effect of KRW 1.3 trillion.

LTE-R based Korean train control system



World's first commercialization of 400km/h ultra-high speed technology

KR is focued on securing core technologies of the future, such as the world's first 400 km/h class high speed rail. KR is preparing technical criteria for 400 km/h HSR and has established the criteria for tunnel cross section, track center distance and trackbed design in 2019, and is working on the technical requirements for catenary system, signaling, communications, and tracks. We are, at present, building a cmmercial line using this technology o the second double section between Osong and Pyeongtaek. By expanding the application of the latest advanced technologies to both new and existing lines, continued efforts will be made to sharpen competitiveness of domestic rail technologies.

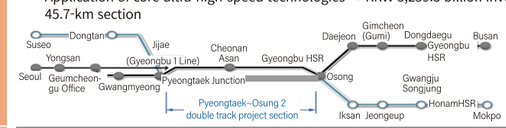
400 km/h HSR – Core technologies

Development of ultra-high speed rail technology	Development status
High-speed tunnel optimization (KRHTO)	Best tunnel cross sectional area for passage of 400 km/h trains * Tunnel cross sectional area 97.2 m2, track center distance 4.7 m (Dec. 2019)
High-speed catenary system (KRHCS)	System that supplies 25kV electricity to trains * Technology localization completed for various ranges of speeds between 200 km/h to 400 km/h
High-speed railway wireless communication network (LTE-R)	Wireless communication network specialized for railways capable of transmitting large data at high speeds * Technology development and verification completed for speeds up to 350 km/h (Sept. 2019) * Technology verification for 400 km/h underway
High-speed train control system (KTCS-2)	System that detects train location in real time and prevents collisions * Technology development and verification completed for speeds up to 350 km/h (Sept. 2019) * Technology verification for 400 km/h underway
High-speed rail fastening device (KR RFD)	Rail fastener that secures running rails to sleepers for sate train operations * Technology development completed and patents registered in Korea and other countries (2015 to 2018)

Construction of 400 km/h HSR (second double track on Osong-Pyeongtaek section)

Construction begun in 2019

- Application of core ultra-high-speed technologies → KRW 3,259.3 billion invested on the 45.7-km section



Operation to begin in 2025

[Frequency of train operation] 190 times → 380 times (more than double), [Operation time] Time from Seoul to Busan to be decreased by up to one hour.

Korea Railways & Logistics Fair 2019

Korea Railways & Logistics Fair 2019, the largest ever

KR hosted the Korea Railways & Logistics Fair, the only railway related exposition in Korea, in June 2019. As many as 165 companies from 23 countries participated in the expo to introduce the latest railway technology and discuss the future direction of the industry. In particular, 933 booths, the largest number of booths ever, introduced products and advanced technologies in various areas including the railway industry. KR introduced new railway technologies and new construction methods and provided a forum for sharing the vision of Korean railway at the Expo. We also introduced information on Korean railway products to support their export and to provide opportunities for technology exchange with foreign companies.

Vitalization of technology development for growth of SMEs

KR is expanding its projects under the condition of purchase to allow SMEs' participation in technology development. The projects under the condition of purchase are based on a policy by which we promise to purchase the developed products so that SMEs that have difficulties marketing their products and finding buyers can engage in technology development with peace of mind. KR purchased these products worth KRW 425 billion by supporting technology development.

Technologies developed by SMEs under condition to purchase contracts

Projects	Purchase amount
① Smart electricity quality improvement device development	KRW 5.4 billion
② High-strength lattice girder develomnt	KRW 1.5 billion
③ IP-based electronic interlocking system	KRW 400 billion
④ Control relay kit development	KRW 1.2 billion
⑤ AT functional phase separable and reduced insulation main transformer	KRW 15 billion
⑥ Compact wall mountable load break switch	KRW 1.9 billion

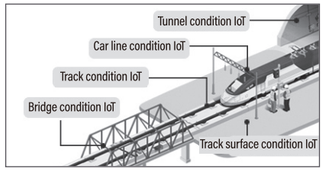
Introduction of technology to improve customer service

Advanced smart IoT technology to enhance safety

KR is continuously expanding the national railway facilities and responding to deterioration of facilities by introducing the IoT system ⊠ a monitoring system that automatically measures and manages the condition of railway facilities remotely. Displacement and stress (force to protect the original shape) of structures such as bridges and tunnels are frequently checked, and the temperature of rails in summer is measured, and relayed to the control center for the control of train operation. Also, it is highly utilized throughout railway services, such as remotely improving air quality by measuring fine-dust levels in railway stations. By 2022, the Gyeonggang Line IoT system is being operated on a trial basis on the 11km Seowonju⊠Hoengseong section, and will be expanded to nationwide railway lines in the future.

Use of IoT technology in railway facilities management

- Integration of railway facility DB and GIS DB
- System specialized for railways by adopting advanced technologies, such as IoT
- Data analysis and forecasting abnormal conditions using sensors installed in the facilities



Integrated Railway Facility Information Management System (KR RAFIS) for enhanced public safety

KR is establishing 'KR RAFIS (Rail Facilities Information & History System)' to systematically manage some 2.64 million railway facilities throughout the country. 'RAFIS' is a system that supports decision-making by analyzing comprehensive information such as history, repair and improvement of railway facilities with big data. Preemptive prevention measures will also be possible by analyzing patterns and trends derived through 'the data mining' by 'RAFIS.' KR will provide safe railway services to the public by thorough management of railway facilities per lifecycle using 'RAFIS,' of which implementation will be completed in 2021.

Stations merged with 4th Industrial Revolution technologies for service close to people's lives

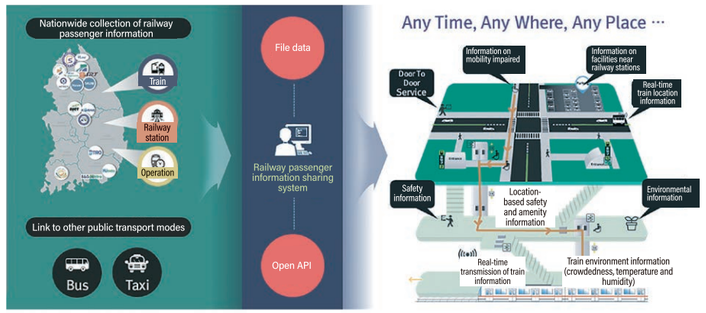
KR is promoting the establishment of future smart railway stations to improve convenience, stability, eco-friendliness and efficiency for passengers inside the railway stations by combining information telecommunication technologies. As part of such effort, we are promoting the introductin of 'the fine dust SMART management system for underground railway stations' and 'the mobile, real-time information service' using the big data and the IoT technologies. Currently, those systes are being tested in the underground GTX stations (6 stations) and in the Seohae Line double tracking project and will be applied to all projects of KR in the future.

Improvement of railway station services	SMART fine-dust management system Management of air quality in railway stations using AI Maintenance of air quality standard PM10, PM 5 standard value or below [Automatic control of indoor air quality]	Provision of mobile real-time information Emergency evacuation information / Direction service [Prompt emergency response] [Improvement of passenger crowdedness]
Stations with the new services	• Six underground GTX stations, Indeogwon Station and Dongtan Station	• ICT smart demonstration station * [Demonstration railway station] Seohae Line double-track electrification project

Technology using public data to improve rail transport mobility for people with mobility impairement.

KR established the Rail Portal, a railway information system, by working with 15 related institutions. The Rail Portal provides public data (amenities, moving lines for the transportation vulnerable, etc.) related to 1,013 metropolitan railway stations nationwide. In particular, the Portal provides data through the Open API* method so that the private sector can easily use the data to develop applications and services. The Rail Portal was selected as the best example in the 2019 Government Innovation Fair hosted by the Ministry of the Interior and Safety. Generation of new business is expected, as a service utilizing a private company called "Kakao Map" is to be launched in 2020.

* **Open API (Application Programming Interface):** An application program development environment opened to the public use.



Enhancement of Railway Asset Value

KR is efficiently managing its railway assets, while pursuing diverse revenue projects. Revenues from asset management are being reinvested to enhance public character, such as strengthening railway safety. As a public railway facility manager, KR, as the manager of national railway facilities, will always strive to operate and manage railway assets for recovery and growth of community.

Related SDGs: 9 Industry, Innovation and Infrastructure

Railway asset management system for sustainable growth

Establishment of asset utilization system through improvement of systems, such as amendment of laws

KR is strengthening the virtuous cycle of 'recovery of investment in railway construction-reinvestment to strengthen public character' by generating profit through asset utilization. Through the amendment of relevant laws, KR achieved KRW 193.4 billion income from asset utilization in 2019 by providing the basis for development of about 32 million square meters of abandoned lines and railway stations and unconstructed lines. We are also laying the foundation for the utilization of assets that will allow us to jointly grow with private businesses by improving the system to remove the lease barriers of private capital stations that belong to the state.

Improvement of railway asset development incentive system

Amended laws	Purpose of amendment	Before amendment	After amendment
Korea National Railway Act	Expansion of project funds	Limited to the fees for use of state-owned properties	Added the occupation and use fee
	Expansion of project scope	Limited to acquisition and management of real estate	Expanded to supply of real estate
Railway Construction Act	Expanded the subject of occupation and use	Occupation and use of only the railway facilities was approved	Entire nationally owned railway property (including idle land, such as discarded lines and railway stations)
Railway Service Act	Removal of lease barriers regarding private capital stations that belong to the state	Short lease period (maximum 10 years) compared to the previous occupation and use approval (30 years) and prohibition of sublease	Longer lease period (maximum 20 years) and sublease allowed
Expected results	Increased the project funds and additionally acquired the development site subject to occupation and use (about 31,500,000㎡ of idle land)		
	Generation of KRW 40 billion additional income through private capital station occupation and use approval		

Advancement of national asset management system

KR strives to enhance property management and improve civil service through the introduction of advanced new technologies. The Integrated National Property Management System, which KR plans to establish by 2020 will provide relevant information based on the GIS. The system enables users to check the state of operation of national property in real time and to process civil service services, such as application for permission of use, on a one-stop basis. The System is expected to reduce the annual civil service processing time by about 6,500 hours. Also, KR is actively using drones to efficiently manage the national property. In 2019, KR additionally secured 8,382 lots of land through real-time drone photographing.

	Individual systems (~2019)	System design (Aug. ~Dec.)	System integration (2020~)
Property management system	• Data scattered in individual systems • Lack of GIS information link • Employee-oriented internal networks • Public information focused on lists	• Data integration and linkage • Real-time provision of GIS information • User-oriented website • Drawings, photographs and videos available	• Less labor hours (6,500 hr/yr less) spent handing civil complaints • Public platform for railway properties

Drone utilization project	Drone photography	Photographed 212.3km of Donghae Line (unconstructed segment from Pohang to Gosung) using drones and created drawings
	Cadastral survey	Completed per zone survey (1,654 land lots) in Gangneung-si segment (245 land lots)
	System	Establishment of a property program that realized images, drawings and land registration map
	Promotion result	Can check the registered land boundaries and current use using the latest images on a real-time basis

Used PPP stations reverted to sate as models

Station built using private capital

-> Private given 30-year concession period

Station leased to new lessees upon termination of concession period

-> Maximum 20-year lease (used to be 10-year lease)
-> Job security guaranteed for small businesses (2 years)

Full scale development of Suseo Station area

Commencement of (former) Donghae Nambu Line construction

Commencement of Nonhyun Station (Incheon) construction

Multilateral asset development activity through balance between public character and efficiency

Preparation of method and system for rational use of private capital stations belonging to the state (former Seoul Station and Youngdeungpo Station)

KR implemented a plan to normalize the private capital stations of which occupation and use is expired (former Seoul Station and Youngdeungpo Station) after they were returned to the state in consideration of protection of small business owners and the increase of profits. During this normalization process, we guaranteed the employment of small business owners for two years and extended the use approval period to up to 20 years to secure a stable profit base for the businesses and KR.

2018	2019	2020 and onwards
• Return of PPP station to the state (Dec. 2017) • Job security guaranteed to small businesses for 2 years	• Improved the fair competition system (April) • Selected the new contractor(June)	• Secure a long-term, stable source of profit • Share PPP station best practice

Asset development projects for co-prosperity with local communities

KR strives to harmonize public character and efficiency by gathering diverse opinions from local governments and local residents in the process of promoting projects for developing railway station areas. Development of Suseo Station area is being promoted in earnest through active cooperation with government agencies, local governments, local residents and other public it is expected to contribute to revitalization of the local economy by creating 15,317 jobs. KR is promoting Nonhyeon Station (Incheon) and former Donghae Nambu Line development projects also by reflecting various opinions of the local community.

Asset development projects for co-prosperity with local communities

Full scale development of Suseo Station district	• Construct 2,545 units of public housing and increae capacity of park & ride by 1,000 for increaed convenience • Completed early compensation by sharing development profits gain with pre-development residents/occupants • Project efficiency enhanced through equity participation by relevant public corporations (LH and SH) • Vitalize local economy by creating new 15,317 jobs
Start of (former) Donghae Nambu Line construction	Accepted the request of local community for preservation of Songjung Station in its original shape
Start of Nonhyun Station (Incheon) construction	Reduced the size of sales facilities to achieve win-win relationship with local small businesses

Enlargement of railway asset value through participation by and cooperation with the people

KR operates various types of participation channels to promote development projects that the people want. In order to promote public participation, we are holding a public contest for ideas and expanding the selection of projects reflecting residents' suggestions. We are also expanding cooperation with other institutions and local governments to promote projects more effectively and provide high-quality services. We will continue to make efforts to utilize railway assets in the direction that the people want by collecting various opinions when promoting the development projects.

Respect people's wishes in use of railway assets

Public idea contest	Selection of private sector proposal	Project in cooperation with local governments and other institutions
Creation of living and culture platform using discarded Gyeongchoon Line land	Expanded the parking lot at Osong Station Applied the proposal of private sector to Donghae Nambu Line (Gyeongju Station ~ Bulkooksa Station) development project	Promoted 67 cooperative projects, including Wolwha Street in Gangneung and Eco Park in Gwangyang

4

KR Sustainable

COMMUNICATION AND PARTICIPATION BRINGING IN NEW BREEZE KR

- VIBRANT CORPORATE CULTURE
- HUMAN RESOURCES DEVELOPMENT
- COMMUNICATION AND PARTICIPATION

Vibrant Corporate Culture

- KR operates a work-family compatibility welfare system that meets the employees' expectations by gathering various opinions based on horizontal communication across the company. In addition, various labor-management partnership promotion activities are being carried out to establish trust and harmony between labor and management, and all members are making a happy KR through joint efforts for realization of a good workplace.

Related SDGs

Family-friendliness Certificate

가족친화인증서

기 관 명 : 한국철도시설공단
소 재 지 : 세종광역시 동구 충무로 340 (수정동)
유효기간 : 2018.12.01~2020.11.30

위 기관은 "가족친화 사회환경의 조성 촉진에 관한 법률", 제15조 제1항에 따라 우수한 가족친화경영 운영체계를 구축하고 가족친화제도를 운영함으로써 근로자의 일 · 생활 균형을 지원하고 국가경쟁력 향상에 기여하였기에 가족친화기관으로 인증합니다.

2018년 12월 18일

여성가족부장관

Happy, human-centric workplace

Establishment of system for creation of work-family compatible organizational culture

KR operates a work-family compatibility welfare system that meets the employees' expectations by gathering various opinions based on horizontal communication across the company. In addition, various labor-management partnership promotion activities are being carried out to establish trust and harmony between labor and management, and all members are making a happy KR through joint efforts for realization of a good workplace.

Goal

Smaller work hours, greater quality of life
Happy and exciting family life, KR

Direction of implementation and recommended tasks

Elimination of culture that emphasizes long work hours	Flexibility of working methods	Support for pregnancy, childbirth and childcare
• Innovation of work style • Improvement of system to assure 'life with break' for the employees	• Vitalization of flexible work demonstrated by the executives and high-level managers themselves • Recommendation of using work hour selection system	• Creation of 'mom-friendly KR' • Vitalization of paternity leave • Child-raising support for each life cycle segment

Performance index

Number of leave days taken per person	Rate of using flexible work	Family-friendliness certification

Received a certification for being a family-friendly institution by establishing a system that provides child-raising support for each life cycle segment

KR is creating a workplace where work and family can coexist by establishing a childcare support system tailored to the employee's lifecycle. We are strengthening the essential institutional support for each period lifecycle periods of our employees, such as marriage, pregnancy and child care. In addition, we are creating a family-friendly organizational culture by securing 100 percent replacement workforce for vacancies created by the workers on child-raising leave in 2019 and achieving more than 40% of child-raising leave taken by male employees by creating an environment for male employees to participate in childcare. KR will continue to discover and promote systems that enhance understanding and bonds within families.

Marriage	Pregnancy and childbirth	Child-raising	Results
Encouragement of marriage • Encouragement of use of long honeymoon leave Support for infertility treatment • Infertility treatment leave (3 days)	Pregnancy • Guarantee of wage level when reducing work hours Childbirth • Expansion of childbirth encouragement allowance (third children ⇒ second children)	Nursery • Creation of safe nursery by installing CCTV cameras, etc. Family invitation events • Increase the frequency of workplace experience day event for the families (once ⇒ twice)	• Family friendly institution certificate awarded by the Ministry of Gender Equality and Family for five consecutiv years (2015~2019) • Rate of those who used child-raising leave immediately after childbirth reached 100% for two consecutive years

Vitalization of flexible work demonstrated by the managers themselves

KR is encouraging its managers to actively participate in flexible working methods by taking the initiative in flexible working, so that the employees who need flexible working systems, such as flexible work and flextime work, can freely use them. In 2019, the number of managers using the flexible work system increased significantly from 83 in the previous year to 168. As a result, the number of entire employees using flexible work and flextime work reached 1,187, a sharp increase from that of the previous year (618), resulting in a great achievement in creating a free working environment in the workplace.

Classification	Before improvement	Improvement	Result
Flexible work system	- Low participation by managers (83 persons) - Flexible work application was manually filled out	- Managers took the lead and participated in the system (168 persons) ⇒ Encouraged all employees to participate - Application method was improved to on-line application	618 persons → 1,187 persons (2018 – 2019)
Flextime work system	- Not enough motivation, including incentive - Reduction of work hour based salary level for those who participated in flextime work	- Gave additional points to the organization of which members participated in flextime work when evaluated by the organization - Maintained the salary level of those who took flextime work for pregnancy or child raising	22 persons → 68 persons (2018 – 2019)

Support for "life with break"

KR operates a "life with break" support system, which includes establishment of hour-based leave days, guarantee of substitute day off for weekend duty, improvement of PC-OFF (twice a week), etc., by collecting opinions from employees through communication channels such as labor-management council, collective bargaining agreement and gender equality committee. As a result, we achieved 11.8 days of vacation per person (increased by 1.8 days from the previous year), 2,125 persons who used the alternative leave days (increased by 928 persons from the previous year), and 114 hours of overtime work per person per year (reduced by 6 hours from the previous year) in 2019.

Activities carried out	Results		
	Use of vacation was recommended	Guarantee of right to relax	Increased scope of PC-OFF
Gathering of needs and VOC • Request or flexible vacation system • Need to guarantee the right to relax for work and family compatibility	• Long vacation was vitalized • Hour-based annual leave was newly created	• Guaranteed break time for night time work • Alternative leave for weekend duty	• Once per week, PC-OFF at 19:00 ⇒ twice per week PC-OFF at 18:30
Operation of management-labor communication channel • Management-Labor Representative Group Management Meeting and Management-Labor Joint Committee • Gender Equality Committee	Number of leave days per person increased 10.0 days → 11.8 days (2018 – 2019)	Employees who took the alternative leave increased 1,197 persons → 2,125 persons (2018 – 2019)	Overtime work per person decreased 120 hrs. → 114 hrs. (2018 – 2019)

Gifts and cards

Letter from the Chairman & CEO

Presentation of gifts to the employees

Promotion of 'Mom-friendly KR' system for the pregnant employees

KR operates the 'Mom-friendly KR' program to care for pregnant employees in order to spread the organizational culture for work-family compatibility. "Mom-friendly KR" is an organizational culture program in which the Chairman & CEO of KR presents cream exclusively for pregnant women together with a congratulatory card to pregnant employees and their families and sends letters to the organizations to which the pregnant employees belong asking for consideration for pregnant employees. Other aspects of the maternity protection program KR provides include paid maternity leave before and after childbirth, infertility treatment leave, maternity protection time of two hours per day, and monthly medical check leave. Through the introduction and spread of these maternal protection programs, the female employee's organizational confidence index rose by 18% (50 to 59 points) year-on-year. We will continue to make efforts to create an organizational culture in which pregnant employees can work with peace of mind.

KR Family Invitation Event

KR Family Invitation Event

KR Family Invitation Event is a typical family-friendly event that has been held for nine years, where the families of employees can understand KR better. In 2019, about 50 persons from the families of employees participated in KR Family Invitation Event. The members of employees' families enjoyed various experience-type activities, as they watched a large LED touchscreen introducing the vision of the national railway, experienced the tunnel construction process with virtual reality (VR). KR will continue to offer various family-friendly programs, so that the employees will feel proud of KR and be satisfied as the internal customers.

Operation of a reasonable welfare system that reflects the management environment and the employees' needs

KR operates a welfare benefit system to efficiently utilize the limited resources with the aim of 'operating a consumer-centered welfare system and managing reasonable welfare benefit cost through self-inspection.' The main directions of this scheme are improvement of the system, improvement of the working environment and expansion of non-monetary welfare. KR has selected and is implementing six tasks related to these directions. In addition, we are committed to creating a stable working environment by operating a separate stress-relief program and regional mental health welfare centers to manage the job stress of our employees.

Goals and tasks of promoting welfare benefits

Goals	Operation of a customer-oriented welfare benefit system and reasonable management of welfare benefit costs through self-inspection		
Direction and tasks of promotion	System improvement	Improvement of working environment	Expansion of non-monetary welfare
	• Improvement of recreation facilities and standards on their use • Improvement of housing management plan	• Improvement of office environment for the hands-on workers • Expansion of physical training gym	• Guarantee of relaxation at affiliated locations, such as hotels, etc. • Expansion of health-related coupons at affiliated hospitals
Major achievements	• Maintenance of Mangsang Training Center • Introduction of housing management by external advisors	• Improvement of the working conditions of major facility protection (working-level) staff • Significant improvement of physical exercise gym	• Stronger management of job stress • Strengthened benefits from affiliated hospitals, hotels and financial institutions

Welfare benefits provided to full-time employees

Classification	Summary	Description
Selective welfare	Provision of welfare point	Assigned to 2,027 persons
Physical training gym	Physical training gym in the Head Office (316m2)	Twelve different types of equipment, including treadmill, used by about 80 persons per day
Health examination	Free health examination for employees	One free health examination for an employee per year
Operation of a mutual aid society	Provides help for the employees' congratulatory and condolence events	KRW 10,000 monthly fee (deducted from the payroll)
Training center and relaxation facility	Support for vacation and leisure activity	Training centers (3 locations), condominium membership (10 accounts), Summer vacation facility (yearly contract)
Nursery	Childcare service for employees	Two nurseries for 114 children and 32 teachers
Employee housing	Housing support for the employees from different regions	Operated by the in-house welfare fund
elective welfare	Operated by consignment in the Head Office	Provides three meals per day for KRW 3,000 to 4,000
elective welfare	Guarantee of retirement benefit to employees	General retirement allowance, defined benefit (DB) and defined contribution (DC) are provided
elective welfare	Provision of college registration fee for employees' children	Semi-annually. Interest-free loan
elective welfare	Support for leisure activity	KRW 63 million provided to 49 groups where 1,023 employees are members

Management-labor cooperation indexindex development and innovative industry de

83.5 (2018) → 86.1 points (2019)

Level of satisfaction on communication

77.4 (2018) → 81.9 points (2019)

Number of persons who completed labor training

1,165 (2018) → 1,414 persons (2019)

2019 Management-Labor Harmony Festival

Execution of wage agreement and collective bargaining agreement for 2019

Improvement of management-labor relations

Launch of a new executive branch of the labor union, and establishment of a body for management-labor conference for realization of common values

In 2019, KR established 'KR management and labor, companions who create social value and future' as a strategic goal and is creating a culture of co-existance by the management and the labor centered around cooperation. To realize the management-labor relationship of participation and cooperation, KR has expanded the Management-Labor Conference at the Head Office into the Management-Labor Representative Group Management Conference. The representatives of KR's management and labor union held four management conferences in 2019 and agreed on 35 items, including greater compensation for injuries suffered by the accidents occurring in the course of work.

Goals	KR Management and Labor - companions who create social value and a future		
Direction	Vitalization of management-labor council by reinforcing participation and cooperation	Improvement of management-labor partnership by reinforcing communication and capacity	Practical improvement of working conditions and realization of respect for labor
Strategic tasks	• Increased participation by the members and establishment of a sound management-labor relationship • Reinforcement of safety, human rights and social responsibility	• Vitalization of communication between members of management and labor • Reinforcement of capacity to manage the management-labor relationship	• Execution of wage and collective bargaining agreements for win-win relations between management and labor • Improvement of working conditions through human-oriented management-labor negotiation
Performance indices	• Management-labor cooperation index • Level of awareness on respect for human rights	• Level of satisfaction on communication • Level of satisfaction on management-labor relationship	• Rate of agreement for negotiations for wage and collective bargaining • Level of satisfaction among employees

The first festival of management-Labor harmony and communication in KR's history

For the first time in its history, KR held the 'KR Management-Labor Harmony and Communication Festival' under the theme of 'Fifteen years gone by, 100 years ahead, and the future of working together,' where all members of KR gathered without dividing management and labor. At the event, all employees from Head Office and Regional Offices gathered together to pledge management-labor harmony for the next 100 years' railway era and spent time of communication and harmony through various games, such as group rope jumping, volleyball, etc. KR will continue to expand such opportunities for communication, so that its management and labor can cooperate on the basis of one mind and one will.

Execution of wage and collective bargaining agreements without any disputes

Based on a management-labor relationship of mutual trust, KR executed wage and collective bargaining agreements for 2019 without any disputes. The management and the labor made full preliminary negotiation and working-level review using management-labor consultative groups, such as the Management-Labor Joint Committee and the Management-Labor Representative Group Management Meeting, and achieved agreement by 95.2% of the employees on 35 provisions of the agreements and wage and collective bargaining agreements without dispute. Major contents of the collective bargaining agreement include: Prevention of sexual harassment; reinforcement of workplace harassment prevention directives; operation of programs that will manage diseases and work-related stress of the employees; programs to encourage the use of yearly leave; and so forth. Major contents of the wage agreement include: compliance with the government guidelines on wage increase (1.8%); practical improvement of treatment for the employees who had been converted to regular employees.

Major amendments (38 provisions) to the collective bargaining agreement

Improvement of working conditions	Creation of safe workplaces	Realization of respect for labor
• Securing an adequate number of manpower for both management and labor • Application of actual night time work • Improvement of nursing facility and recreation center operation	• Establishment of disease and duty stress prevention program • Greater support for work-related accidents	• Expansion of statutory work hour exemption 11,000 hours in 2019 ⇒ 12,000 ours in 2020 • Introduction of hour-based yearly leave system

Human Resources Development

- KR established an expectation for desirable talent to achieve its mid- to long-term management strategy, management goals and vision, and operates a systematic human resource development program. In particular, with the recent retirements of many baby boomers and the increase in new employees, the organization's workforce composition is rapidly changing. We are focusing on passing and sharing the working-level knowledge, keeping pace with such changes in the internal environment.

Related SDGs

Talent-oriented management

Establishment of direction and reinforcement of foundation for talent development

KR established a direction for development of talents specializing in railways to which management goals and environmental change are applied. We are not only operating various capacity-building programs, such as reinforcement of job capability and expertise and internalization of basic qualities appropriate for the three main qualities of talents KR expects ('creator,' 'expert' and 'sociable person') but also reinforcing the foundation of their promotion through reorganization and training-system improvement.

Set directions for railway professional training

Vision

Realization of rail network that expands into the world beyond the Korean Peninsula

Management goals for 2025

Establishment of integrated railway network on the Korean Peninsula	Reinforcement of safe railway system	Preparation of future growth engine	Creation of social value
Promotion of inter-Korean railway link project (total length: 5,020km)	Reduction of railway facility accidents by 30%	KRW 1 trillion profit from projects	Create 73,000 jobs

KR's concept of railway professional

Creator	Expert	Socially responsible
Pursuit of creativity while continuing to challenge	Pursuit of world's best railway technology and global capacity	Cultivation of lucid sense of ethics and spirit of social contribution

Directions for railway professional training

Establishment of HR foundation (2013~2014)	Establishment of expert foundation (2015~2019)	Global No.1 (2020~)
• Establishment of system and infrastructure • Preparation of contents for capacity reinforcement	• Establishment of talent development strategy system • Establishment of capacity reinforcement roadmap	• Development of creative management leader • Development of global expert

Directions for talent development

Internalization of basic knowledge	Development of future leader	Reinforcement of expertise	Procurement of global capacity
Internalization of integrity, ethics and safety	Future management leader and change management expert	Professional technology training and response to environmental change	International business skills and language education

Improvement of system for reinforcement of talent development base

Reinforcement of organization

Before improvement
- Decline of executive ability due to dispersion of training function
  - [Planning] HR Development Div., [operation] Human Resources Development Institute

After improvement
- Training function is unified and reinforced
  - Creation of Human Resources Development Division and promotion to Division

Expansion of infrastructure

- Advancement of training by development of mobile application
  - Attendance management by QR code, survey, etc.
- Increased budget (KRW 1.5 billion → KRW 2.1 billion)
  - Expansion of training programs (365 → 399)Division and promotion to Division

System improvement

Improvement of training quality	Reinforcement of compensation	Motivation
• Systematization of Training Operation Committee - Quality management, such as selection of instructors	• Training history is applied to promotion review (10%) • Language skills are given additional points (0.3 points)	• 10% of training cost to be paid by the trainees

Improvement of technological capacity per area by operating expert development programs

KR has opened and operated various specialized certification courses to flexibly respond to rapidly changing environments and provide the best railway infrastructure for the people. KR operates four courses, including railway engineer certification courses, and construction safety engineer certification courses and railway operation safety manager courses. KR also provides training for obtaining drone licenses to boost the competitiveness of railway using 4th Industrial Revolution Technology. KR will develop and operate substantial education programs to improve technological capacity dedicated for railway.w

Railway professional training programs

Courses	Curriculum	Results
Obtain professional licenses Railway operation safety manager Drone	• [Technology] Professional Engineer course (3 courses) • [Clerical] Licensed Real Estate Agent course • Commissioned safety manager training • Drone license course	• The largest number of employees who acquired Professional Engineer licenses in a year since establishment of KR (12 persons) • Three employees passed the 1st test of Licensed Real Estate Agent test

Reinforced job capability by improving essential job training courses

KR has improved and operated the essential job training courses to strengthen the employees' capacity for sustainable development of KR. In order to operate the consumer-centered curriculum, we set goals appropriate for each position and shortened the training period from 10 days to 8 days to ensure that work and training are appropriately carried out in parallel. In addition, we integrated the curriculum from 5 to 3 levels and conducted customized field trips for each job series. We will continue to establish and implement customized training courses tailored to the needs of our employees, thereby laying the foundation for developing railway professionals.

Improving and providing essential job training courses

Before improvement	Before improvement
• One-time 2-week course per job series and job grade (10 days) • 5 levels (entry, basic, in-depth 1, in-depth 2 and professional) • Uniform training by site visit	• Divided to two sessions (3 days for common course + 5 days for professional course) to reduce the burden • Simplified to 3 levels (entry, in-depth and professional) • Implemented customized site visit training per job series

Training course and trainees		Description	Number of trainees completing training
Entry	Staff	• Railway theory and development of basic capacity	207
In-depth	Manager and Junior Manager	• Expert with professional knowledge and problem-solving capacity	183
Professional	General Manager and Senior Manager	• Manager with integrated knowledge, leadership and future capacity	231

Strengthened work-efficiency by sharing working-level know-how

KR has recently been facing drastic changes in the organization's workforce composition. The retirements of the baby boomers have increased the proportion of new employees, thus increasing the need for transfer and sharing of working knowledge within the organization. In order to systematically transfer business know-how, we have reorganized 36 manuals for each business and provide lecture capacity-improvement training for each job expert. Based on this, we provide more than eight hours of job manual training annually to have the experts with working-level knowledge and know-how on their jobs pass on their expertise to the new employees.

Operation of job manual training

1	2	3
Job manual organization	Implementation of instructor training	Regularization of job manual training
• Total of 36 job manuals and updated 2 manuals	• Implemented the job manual instructor instruction skill training course (48 trainees completed the course)	• Autonomous training for 8 or more hours per year • Passed down the expertise of senior employees

Greater Customer Involvement

- KR encouraging the people and partner companies to participate in the entire process of policy development and implementation to establish a railway policy centered on social values. We also strive to satisfy the rights of the people to know and provide public railway services that meet customers' expectations through transparent, customer-centered information disclosure.

Related SDGs

Vitalization of communication with and participation by the customers

Vitalization of railway policy development through the people's participation

KR has launched the 'National Participation Railway Policy Development Plan' and is promoting public participation in the entire process of idea contest and development and implementation of policies. We have completed five immediate implementation tasks out of nine ideas selected from the public contest in 2019, and are separately carrying out the tasks that had been identified by a thesis contest and research service after classifying them into mid- to long-term tasks. We will provide public railway services for the people through various channels of participation in railway policy.

National participatory railway policy development process

Public contest for ideas	Theses by undergraduate and graduate students	Research service
Theme selection (KR National Mentor Group survey) Start of idea contest	Theses contest for college students based on their ideas	Request for research of mid- to long-term tasks by professional institutions
Five immediate tasks (completed) (Suggestion for installation of LED signposts outside railway stations, etc.)	Three contest announcements for theses (to be carried out) (Improvement of local transportation by establishing direct transfer to buses)	Eight research tasks (to be carried out) (Establishment of circular railway that detours the capital region cargo trains)

Public railway service created together with the people

KR provides a railway service created by KR and the people together through open participation and communication. We abolished the existing customary way of holding an open contest for designs, and implemented an international design contest for a railway station (Jeonju Station). Also, we established a promotion plan applying the people suggested, the installation of women's safety facilities (such as CCTV cameras in washrooms, etc.) to prevent crimes in railway stations, as a solution for safe use of railway stations. The trial implementation was completed after conducting on-site surveys with the people.

Public railway service created together with the people

<Extension of Jeonju Station>

Presentation of contest-winning plan for Jeonju Station to residents	Three-dimensional drawing of contest-winning design for Jeonju Station extension project

<Installation of facilities for women's safety>

Women's safety facility installation plan		Joint on-site inspection with the people	
Access monitoring for washrooms, etc.	Installation of warning message board	On-site inspection	Collection of opinion

Results of 'What can I help you with?' campaign

Improvement of fair economy tasks	60 cases
Level of customer satisfaction	S Level (the highest level)
CS index	93.06 points (target: 91.9 points)

2019 SNS Reporter Group launching ceremony

Information disclosure per area

Registration of information in advance
138 cases (58 cases more than the target)

Rate of original information disclosure
62.1% (increased by 9.3% year-on-year)

Number of days to respond to claims for information disclosure
3.62 days in average (handled 851 cases)

Civil petition processing status
Achieved 'the most excellent (rank 1)' clevel (evaluated by MOLIT)

'What can I help you with?' campaign for customer satisfaction

Through the 'What can I help you with?' campaign, KR is building a customer-centered organizational culture of helping customers with anything when carrying out the work with the customers. As a part of the 'What can I help you with?' campaign, we are developing related CI to carry out various promotional activities and promoting activities that will improve difficulties through meetings with partner companies. We have discovered and improved 60 fair economy tasks in 2019 by promoting customer communication and participation through the 'What can I help you with?' campaign and achieved a customer satisfaction level S and a CS index of 93.06 points.

Operation of SNS Reporter Group for direct participation by the people

KR has the SNS Reporter Group that consists of 40 high school, undergraduate and graduate students and power bloggers who are the railway customers and dream of becoming a railway person in the future. In 2019, the SNS Reporter Group carried out monthly mission activities, such as 'Walking on the Discarded Line of Gyeongchoon Line' and 'Visiting the Gimpo Metro Garage,' produced the contents of those activities as SNS contents and posted them on blogs, etc. Through this process, we were able to interpret the major issues of KR from the perspective of the people and publicize them by producing creative contents. We will continue to actively support the SNS Reporter Group's activities so that the people will understand and sympathize better with KR.

Transparent information disclosure and improvement of railway information service

For transparent operation, KR is promoting the disclosure of information to the public by dividing it into four major areas. We also provide information services tailored to the needs of the people through 'Rail Portal,' a portal that provides information on amenities at railway stations, and 'Alio Plus,' a public data platform, while enhancing the quality of existing information services.

Provision of information service customized to the needs of customers

Classification	Description	Results
New Rail Portal	Provides amenities at 1,013 railway stations, such as train operation status, moving lines for the transportation vulnerable, etc.	Promoted the use of people-centered public data - Selected as an excellent case by MOIS at the Government Innovation Exposition
New Alio Plus	Provides 303 pieces of information on the facilities and projects of KR, policy proposal, etc.	Greater sharing of public data (railway business, etc.) with the people
Expansion Land Compensation System	Provides real-time information on entire compensation process using a GIS based system	Improved the public service by practicing transparent administration - Received the Minister's Award for Excellent Working Method Innovation Case by MOIS
Expansion Environmental Information Disclosure	Discloses environmental information and environmental management promotion system (10 items)	Environmental Management Index rose by 6.39% year-on-year
Expansion Unit Price Review System	Discloses the road bed unit price calculation information	Improved efficiency by providing construction managers and builders data from other projects
Expansion Idle Land Status Disclosure	Discloses the status of announcements through public data portal, SNS publicity, etc.	Promotion of online and offline information disclosure centered on the customers

KR Sustainable

Sustainability Management System of KR

- GOVERNANCE
- ETHICAL MANAGEMENT
- RISK MANAGEMENT
- STAKEHOLDER INVOLVEMENT
- MATERIALITY ASSESSMENT

Governance

KR operates the Board of Directors, the highest decision making organization that determines major policies of KR. The Board of Directors consists of six executive directors and seven non-executive directors to enhancemutual independence and management transparency. Various professional committees and subcommittees (planning and management, construction and facilities) are operated to ensure that the expertise of the Board of Directors leads to creation of innovative management performance. We also strived to enhance the female representation of the governance structure by appointing three female directors out of 13 directors.

Composition of BOD

Composition of Current BOD

Executive Directors

Name	Current position
Kim Sang-gyun	Chairman & CEO
Jeon Mankyung	Vice Chairman
Lee Jongdo	Head of Administration Services Dept.
Jeon Heekwang	Head of Railway Construction Dept.
Park Minjoo	Head of Railway Systems Engineering Dept.
Kim Youngha	Head of Railway Facilities Management Dept.

Non-executive Directors

Name	Gender	Major experience
Song Gwangseok	Male	Chief Editor, The Daejeon Ilbo (Current) Representative Director of Goodmoning Choongcheong
Son Nanju	Female	(Current) Law Office of Dasan (Attorney) (Current) Auditor, Suwon City Sustainable City Foundation
Jang Jongsik	Male	Control and Telecommunication Planning Officer, Ministry of Construction and Transportation Aviation Policy Officer, Aviation Policy Division, Ministry of Land, Infrastructure and Transport
Seo Youngjin	Male	Councilman, Seoul City Council (Chairman of Transport Committee) (Current) Member of Urban Planning Committee, Mapo-gu
Eom Eunsook	Female	Partner, Audit Dept., Sejung Accounting Company Partner, Audit Dept. Jungdong Accounting Company
Kim Youngdong	Male	Managing Director, KODIT Auditor, Samsung Futures
Shin Yekyung	Female	Researcher, The Seoul Institute (Current) Professor, Construction Engineering Dept., Namseoul University

Person with appointive powers

Position	Person with appointive powers
Chairman & CEO	The President
Auditor	The President
Executive Director	Chairman & CEO
Non-executive Director	Minister of Infrastructure, Land and Transportation

Employee Acceptability Evaluation: Two persons were selected (by the votew of all employees) from a total of four persons, two selected from the pool of 27 private committee members recommended through a meeting of representatives by rank, and two recommended by the labor union, and the Board of Directors appointed the final one person.

Director appointment process

The KR operates the Executive Recommendation Committee to ensure the expertise of management and objectivity in the selection process. Candidates are selected through open executive recruitment, and document screening and in-depth interviews are conducted on the basis of evaluation items set by the Executive Recommendation Committee. Through this process, the person with appointive powers elects the best candidate among the final candidates as an executive. Especially to ensure fairness in selecting directors, participation in the Executive Recommendation Committee by non-executive directors had been expanded from three to seven, and the acceptability test* by all employees is conducted when appointing one civilian member.

Vitalization of BOD operation

KR holds a regular board meeting every month to discuss the management issues and how to resolve them, and swiftly responds to urgent issues by holding an emergency board meeting. We hold a non-executive BOD meeting seven days before the BOD meeting to discuss and gather opinions on the agenda in advance. By explaining all agendas of the BOD meeting during the Chairman & CEO briefing, we enhanced understanding of the agendas and strengthened prior deliberation. Through this, we strive to realize the internalization of the BOD operation and the improvement of the level of completeness of management.

BOD meeting procedure

Non-executive BOD meeting	Application of results	Feedback	BOD meeting
Held 1 week before the BOD meeting - Freely discusses opinions and make in-depth reviews ▶ 100% preliminary review rate	Preliminary review result is applied - Opinions and suggestions are applied and supplemented ▶ Substantialization of supplementation function	Shared with the members of BOD - Understanding on the agenda and quick decision making ▶ Stronger acceptability	Submission after supplementation through preliminary review of agenda - Completeness of agenda is improved ▶ Optimum decision making

Reinforcement of non-executive directors' participation in management

KR appointed management experts from various areas as non-executive directors, so that we can apply their suggestions related to improvement of policies and businesses to management innovation and business efficiency enhancement When various committee meetings are held, non-executive directors are actively utilized, and the independence of the term of office, the right to request audits and the right to request information is guaranteed to promote effective and transparent participation in management. We encourage non-executive directors to make autonomous and reasonable decisions by having the Chairman check the opinions of the non-executive directors at least twice at the time of the BOD meeting and activating sharing and feedback on the results of the non-executive directors meeting.

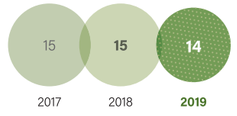
Committee operation status in 2020

Committee	Operation status	Division/Office
Executive Recommendation Committee	Transparent formation and operation of Executive Recommendation Committee	HRM & Welfare Div.
Financial Risk Management Committee	Evaluation of fiancial risk to assure financial soundness	Financial Strategy Div
Audit Advisory Committee	Reinforcement of expertise and fairness of KR's own audit activity, mid-to-long-term audit strategy and audit disposition result appropriateness review	Auditor's Office
Budget Execution Review Committee	Management advisory on major budget related work, such as budget compilation, settlement, early execution of budget, etc.	Planning & Budget Div.
Budget Incentive Review	Review for transparent payment of budget incentive	Planning & Budget Div.
Facilities Subcommittee	Development of railway asset and review of appropriateness for overseas construction project, establishment of local entity, etc.	Facilities Planning Div.
Planning and Management Subcommittee	Reviews mid-term strategic goals, business plan and budget change (proposal)	Planning & Budget Div.
Construction Subcommittee	Reviews railway construction promotion status, on-site quality, safety and related issues	Construction Planning Div.
Accounting Auditor Appointment Committee	Transparently and objectively selects accounting audit institution to check the management of KR	Auditor's Office

BOD operations in 2019

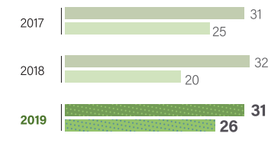
BOD meetings held

unit: time



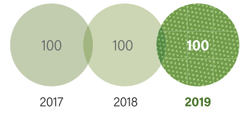
Resolutions and reports

unit: each



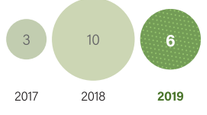
Pre-review ratio

unit: each



Resolutions of modified agendas

unit: each



Participation rate of non-executive directors

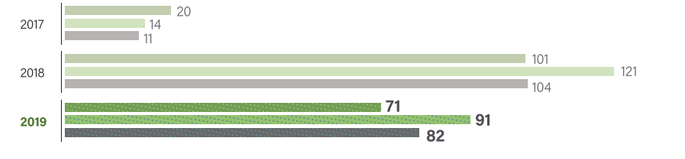
unit: %

Remarks by non-executive directors

unit: %

* Including regular, ad-hoc, and non-executive BOD meetings
* Remarks of non-executive directors out of all directors

Management proposals by non-executive directors



Ethical Management

As the manager of large-scale railway infrastructure projects that require a huge budget, KR is engaged in strong anti-corruption activities to ensure clean and fair business operations. We are operating a strong ethics management promotion system based on the Chairman & CEO and strengthening corruption risk management through active communication with stakeholders. We will continue to work together to realize the world's highest level of ethical management as a global organization dedicated to railway.

Ethical management promotion organization

- **High-ranking offcers' consultative group**
  - Decisions on integrity policy
  - Chairman & CEO
  - **Anti-corruption Ethical Management Committee** (Executive director and heads of organizations)
- **Ethical Management Div.**
- **Integrity Group (14 persons)**
  - **Integrity Ombudsman Head Office**: Five external experts
  - Regional Offices: Two persons each at Youngnam and Choongcheong
- Executive Auditor
- Officer in charge of solicitation prevention Officer in charge of Code of Conduct (Head of Audit Office)
- **Integrity Audit Div.**
- **Ethics Practice Group**
  - Orgnized in each Depatment level
  - Ethics Practice Leader
  - Integrity Protector
  - Members of the organization

Ethical management promotion system

Ethical management strategy and execution organization

With 'realization of integral KR that is clearer, more impartial and more attentional' as the vision, KR is actively practicing ethical management in all railway construction sites. As the organizations that will execute ethical management, KR has appointed an Anti-corruption Ethical Management Committee headed by the Chairman & CEO, dedicated organization in charge of ethical management, the Integrity Protectors for each organization and the Integrity Group. In addition, we have expanded the integrity ombudsman system to all Regional Offices to strengthen the advisory and monitoring functions of experts and stakeholders.

Ethical management promotion strategy

Realization of integral KR that is clearer, more impartial and more focused
CIA (Clear, Impartial, Focused) **KR**

Strategic goal for ethical management: Achievement of level 1 in degree of integrity, level 1 in anti-corruption policy evaluation and zero corruption

Tasks

- **Spread and internalization of integrity culture**
  - Reinforcement of ethical management leadership
  - Customized and communication-type integrity training
- **Preemptive corruption prevention activity**
  - Reinforcement of regulations for prevention of corruption
  - Improvement of systems in the areas prone to corruption
- **Cooperation system of sympathy and communication**
  - Strengthening of stakeholder communication
  - Strengthening of information disclosure and transparency of work

Major achievements in 2019

- **Excellent integrity institution**
  - Achieved the highest score (8.79 points) and excellent class of degree of integrity (class 2)
- **Excellent result from corruption prevention policy evaluation**
  - Received excellent class (class 2) evaluation from corruption prevention policy evaluation for 5 consecutive years
- **ZERO corruption**
  - Zero cases of corruption identified by outsiders
  - No cases of having experienced corruption

Evaluation and monitoring

KR systematically manages corruption risks through an international level anti-corruption management system (ISO 37001). In addition, we are securing the driving force for promotion of ethical management throughout the company by operating anti-corruption policy evaluation and integrity self-survey system for each organization in connection with the evaluation system. All organizations including the five Regional Offices annually conduct anti-corruption planning-implementation-evaluation and proactively respond to corruption risks through their own integrity diagnosis. Through these efforts, we have achieved the highest score ever in the comprehensive integrity evaluation of public institutions in 2019 and achieved the best class for five consecutive years as a result of the anti-corruption policy evaluation.

Number of corruptions identified	Zero cases of corruption identified by outsiders and no cases of having experienced corruption
Result of comprehensive integrity evaluation	Class 2 (excellent class and the highest result ever)
Result of anti-corruption policy evaluation	Class 2 (excellent class for five consecutive years)
Compliance to ISO 37001	Passed the 2019 post-event evaluation and discovered and improved corruption risks (145 cases)

International Anti-Corruption Academy

Report handling process

4. Payment of compensation or reward according to regulations
3. Action and notification of result of action
   Report on illegal subcontracting is notified to related institution and requested for action
2. Investigation of factual relationship and confirmation of legal violation
1. Report and reception of report

Spread of ethical management culture and system improvement

KR ethical management training program

Integrity training focused on strengthening anti-corruption capability and sympathy

KR provides various ethical management training programs to employees and partner companies. We are enhancing the employees' degrees of interest and participation by providing training programs customized to the lifecycle of employees and combine culture and experience activities. Also, we provide an opportunity to improve the related professional capacity through International Anti-Corruption Academy(IACA).

Ethical management training for partner companies

KR is giving efforts to provide anti-corruption training to partner companies. KR provides integrity training by visiting railway construction sites in various parts of the country, to prevent corrupt practices that can occur in the private sector and encourage the partner companies to participate KR's ethical management policies. In 2019, we provided 2,260 field employees with on-site integrity education.

Ethical management training program and its promotion result (2019)

Per life cycle	Development of expertise	Healing training	Areas prone to corruption
Integrity training for the promoted and the newly hired employees (122 persons)	Special anti-corruption training by Anti-Corruption & Civil Rights Commission (all employees)	Integrity musical training (1,609 persons)	On-site training at construction sites (22,560 persons from partner companies)
Integrity training per job grade and duty (634 persons)	IACA training (5 persons)	New Integral Employee experience for the third-year employees (26 persons)	Regional Office Integrity Communication Day (491 persons)

Ethical management activity focused on communication and cooperation

Activities to spread the ethical management culture

Due to the nature of the railway construction project involving many partner companies, it is essential to form a consensus on ethical management through organic communication and cooperation. KR's 'ZERO Corruption' campaign is a communication-oriented ethical management program aimed at employees, partner companies and policy customers. We share our commitment to ethical management in and outside the company and encourage participation in ethical management by promoting continuous promotional activities, rewards for best practices and integrity events throughout the year.

Improvement of anticorruption system centered around communication

KR is trying to preemptively respond to corruption risks in the process of operating the institution and carrying out the project. We are actively improving the system according to the situation of each department, and various opinions gathered through communication activities, such as integrity ombudsman, reverse integrity mentoring system and partner FGI, are applied to improvement of the anti-corruption system. As a result, we have completed a total of 58 improvements in 2019.

Voluntary improvement of systems in the areas prone to corruption (2019)

Total	Amendment of bylaws and procedures	Work transparency	Culture of integrity	Reinforcement of training	Prevention of power abuse	Others
58	24	11	5	6	1	11

Reporting channel and reporter protection system

KR receves and handles reports through the corruption and public interest reporting center and the illegal subcontract reporting center. The reporter is guaranteed personal safety and anonymity, and KR has a rule that prohibits any disadvantageous treatment, so that the reporter will not be subjected to any personal or economic disadvantages due to reporting, etc.. In addition, we strive to create a culture of voluntary reporting by reducing the penalty against the reporter and operating a compensation system for reporters.

Risk Management

KR is making all-out efforts to ensure that the public can use railway, the national infrastructure, more safely and conveniently through the advancement of risk management across management and business.

Establishment of risk management system

Operation of company-wide risk management system

KR has established and is operating an integrated management system based on the integrated (safety, quality and environment) management policy of the Chairman & CEO to meet diverse customer requirements and respond to rapidly changing business environment. The integrated management system is a risk management system for overall railway construction and facility management based on ISO 9001, 14001, 45001*. Through this, we evaluate the requirements of the stakeholders for the entire project process and implement system improvement to advance risk management.

*ISO 9001: A quality management system

ISO 14001: An environment management system

ISO 45001: A safety and health management system

Items of integrated management system and their mutual relation

Risk management process

KR applies the PDCA risk-management method on a series of interconnected works, such as 'railway construction project management, design and construction supervision, commissioning, procurement and inspection, continuous welded rail production and facility management' through the integrated management system. We identify internal and external issues and stakeholders' requirements through the integrated management system every year and establish and implement a response plan through identification and evaluation of risks and opportunities identified from them. In addition, we are fully committed to implementing follow-up measures by identifying the effects of response to risk through company-wide monitoring.

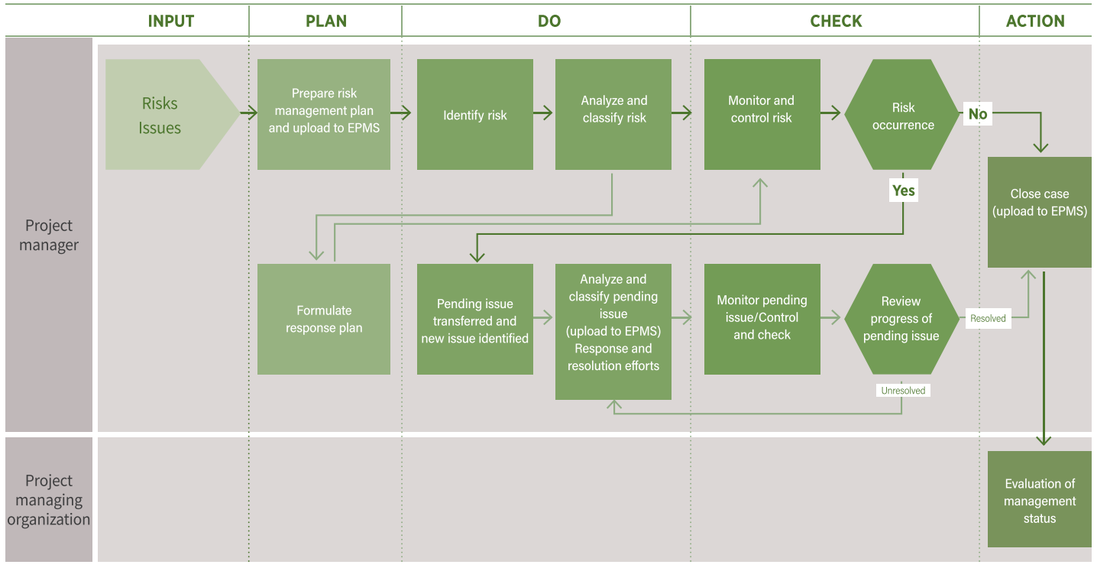
Risk management process

Management of project risk

System for management of risks and issues related to railway construction projects

KR is systematically managing risks and issues in each project and area to build a top-quality railway network at the right time. We register plans to manage the risks of construction projects and register and manage the issues and vulnerable points using company-wide risk management system. Especially for those risks and issues discovered within six months from the start of a project, we are immediately registering them after classifying them into different levels depending on their impact and urgency, so that we can monitor and control them at all times.

Risk and issue management process



Risk and issue management checklist

Risk management	Are risks related to projects discovered and managed? Need to monitor and control the risk by establishing a response plan according to the risk management plan for the discovered risk before it is materialized
Issue management	Are occurred issues managed by using the issue management cards? Classified into 3 stages by the PM according to urgency and degree of difficulty, then systemize the actions taken to resolve the issue for efficient management and reporting

Financial risk management

Profits earned for three consecutive years through effective financial risk management and strengthened profitability

Preemptive response to core causes of financial risks

Items	Risk management indicator	Net income
Market risk	Interest rate fluctuation	Establishment of bond-issuing strategy by acquiring expert advice and analyzing the spread Dispersed issue of bonds depending on the condition of financial market, such as demand for investment and interest rate trend
Liquidity risk	Liquidity holding ratio	Maintain the liquidity holding ratio of 100% or above according to monthly financing plan
Credit risk	Credit rating of financial institution	Trading with financial institutions with mid- to short-term excellent credit rating
	Deposit limit of financial institution	Differentiated application of deposit limit according to the financial institution's size of assets
Operation risk	Self diagnosis of risk control	Periodic inspection of control activity appropriateness in the areas of finance, accounting and tax
	Implementation of new system	Preparation of grounds for electronic registration of bonds issued by amendment of articles of incorporation according to enactment of Act on Electronic Registration of Stocks, Bonds, Etc.

KR is making a company-wide effort to achieve its mid-to-short-term financial goals*. We are responding to financial risks by monitoring key financial risk factors (interest rate, investment and earnings) on a monthly basis and trying to increase profitability through self-rescue efforts. In 2019, we achieved a net profit of KRW 171.7 billion and a surplus for three consecutive years by proactively managing financial risks and strengthening profitability through diversification of asset development projects. We will continue to reduce public debt occurred by railway construction and secure reinvestment funds to strengthen the public nature of railways through effective financial management.

Financial achievements of KR (2019)

Items	Debt	Interest cost	Net income	Interest coverage ratio
Goal	Within KRW 20.48	Within KRW 630.4 billion	KRW 132.6 billion or more	1.19 times or more
jActual	KRW 20.33 trillion	KRW 599 billion	KRW 171.7 billion	1.22 times
Achievement rate	100.7%	105.2%	129.5%	102.5%

Minimization of carried-forward or unused-budget by multilateral budget execution management

KR strives to provide railway services in a timely manner by improving the budget execution rate and minimizing the used and unused budgets. In particular, we actively promoted the 'ZERO Carry Forward' campaign by the leadership of Chairman & CEO, which includes intensive inspection of special management targets, adjustment of project costs between projects and contest of ideas from partner companies and employees. As a result, we were able to reduce the carry-forward amount to KRW 0.3 trillion in 2019, achieving a substantial 'ZERO Carry Forward'. In the future, we will expand research on budget management and continue to discover creative ideas to improve the execution rate and revitalize the economy through establishment of the railway network.

Minimization of carried-forward budget through multilateral and company-wide budget execution management

Achievement of ZERO carry forward

2017 KRW 2.8 trillion

2018 KRW 1.3 trillion

2019 KRW 0.3 trillion

Achievement of early execution beyond the target

59.5%

↓

63.0%

* Financial goals for 2023

Stable financing:

KRW 43.4 trillion

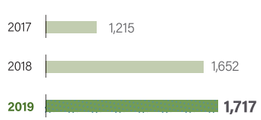
Total debt:

within KRW 21.6 trillion

Interest coverage ratio:

1.35 or above

Net income (in KRW 100 million)



Reinforcement of information security management

Reinforcement of information security management system to realize safe railway infrastructure

KR is proactively responding to intellectualized cyber threats by reorganizing its security-management system with the goal of "implementing a top-level information security-management system in public institutions." Based on such response, we are strengthening our ability to respond to security crises by establishing a smart integrated security-management system based on artificial intelligence for real-time crisis recognition and rapid decision making.

Information security management system

Goal	Implementing a top-level information security management system in public institutions		
Strategic Assignments	Reinforcement of private information safety	Establishment of information security management system	Preemptive prevention of cyber threat
Tasks	Organization of policies and systems Raised awareness and daily practice of rules Assurance of safety in each step	Application of the 4th Industrial Revolution technology Execution of national information security policies Security training customized to each work	Diagnosis of information system vulnerability Security inspection at all sites Simulated training resembling the actual situation
Core Achievement Indicators	Private information management level diagnosis	Information security management status evaluation	Number of cyber violations

Achievement of ZERO leakage by strengthening the level of private information management system

KR is strengthening safety measures for each lifecycle of personal information - collection, utilization, storage and destruction - based on its efforts to organize personal information management policies and enhance awareness on personal information management. The personal information protection guidelines and manuals were revised to clarify the standards for managing access records and to improve the tracking and management of infringement incidents. We are also enhancing our expertise on personal information management by providing customized training for each role of employees, personal information handlers and service providers.

Reinforcement of safety in each step of private information lifecycle

1 Report and reception of report	2 Use	3 Storage	4 Destruction
Integrity training for the promoted and the newly hired employees (122 persons) Integrity training per job grade and duty (634 persons)	Introduction of private information access record management system - Automatic tracing of access history - Warning for abnormal approach	Private information handling system safety inspection (once a month) Supervision and inspection of private information handler (semi-annually)	Destruction of information of which purpose has been fulfilled (8,798 cases) Self-inspection and destruction of private information in PC

Stakeholder Communication & Participation

KR provides railway service that the people can feel by strengthening the customized communication channels which considered core needs and issues of each stakeholder and applying the result of stakeholder communication to the management acitivities.

Identify stakeholder goups and communication channels

Classification of stakeholder and implementation of customized communication strategy based on 'social value'

KR classified stakeholders into value-impact group, value-creation group, and value- sharing group with the aim of "expanding the foundation of stakeholder participation for creation of social values." In order to encourage stakeholders to voluntarily participate, we are striving to establish communication directions by identifying core needs of each group, and to activate organic cooperation with stakeholders by operating communication channels at each stage of new, expanded and continued stages.

Stakeholders and their impacts

KR is making sure that the impacts of each stakeholder will become the driving force of sustainable management. The 'value-impact group' includes the government and the media, which has a great influence on railway policies and sharing of issues, and we are creating a consensus on expanding the railway network and improving the project promotion capability. The 'value creation group' inlcudes the employees and the cooperating institutions of KR who are directly responsible for the management and business promotion, thus we are focusing on internal and external win-win cooperation and joint efforts for high-quality railway construction. The 'value-sharing group' consists of the customers who receive the railway service and we are providing the services that people can feel by collecting opinions through various fields of communication. KR will continue to expand the public-centered railway service by watching out for unfair relationship and communicating with stakeholders through transparent procedures.

Stakeholder communication strategy

Greater stakeholder participation for social value creation

Goal of communication	Stakeholder	Core needs	Direction of communication	Major communication channels: New	Major communication channels: Expanded	Major communication channels: Continued	Activities carried out		Results
Value-impact group	Government Media Local community	• Balance development • Pleasant environment and safe society	• Appeal by visualizing and systematizing KR's efforts on social value creation	• East Asia Railway Community • KR Fair Economy Vitalization Promotion Div.	• Inter-Korean Railway Conference • Preliminary Feasibility Study System Improvement TF • Preliminary Feasibility Study System Improvement TF	• Korea Railway Association • Reporter Group Meeting • Land Acquisition Plan Committee	Government	• Study of strategy for establishment of East Asia Railway Community - Establishment of the forum (June) and hosting of seminar (4 times)	• Creation of execution strategy for each stage of East Asia Railway Community (November) • Business discovery (34 businesses)
							Media	• Meeting with national and local media (as necessary)	• Number of negative articles down by 57.8% year-on-year (64 in 2018 → 27 in 2019)
							Local community	• Win-win idle land utilization consulting (as necessary) • Land Acquisition Plan Committee (14 times)	• Utilization of idle land in collaboration with local governments (2 cases, KRW 11.7 billion) • Strengthened the level of satisfaction by providing compensation for land through residents' participation
Value-creation group	Employees of KR / labor union, partner companies, related institutions, etc.	• A public institution that provides a service • Establish fair economy and win-win culture	• Achievement of win-win cooperation culture for a better KR	• Railway Facilities Safety Joint Innovation Div. • Railway Technology R&D Consultative Group	• Railway Technology Talk Talk / Railway Agora • Innovation Community	• Technology Development Trustee Company Conference • Young Board of Directors / Management-Labor Council • Win-Win Talk-Talk Conference	Employees	• Operation of management-labor council (4 times) and greater participation by the management - Reviewed various systems and issues, such as HR, welfare, etc.	• Level of satisfaction on performance evaluation: 78.2 points (increased by 7.3% year-on-year) • Level of satisfaction on HR management: 74.2 points (increased by 7.5% year-on-year)
							Partner	• Hosting of Win-Win Talk Talk Conference (20 companies) • KR Technology Development Conference (18 companies)	• Discovery and improvement of on-site VOC in 5 Regional Offices • Discovery of new tasks for technology development under the condition of future purchase (2 cases)
							Related institutions	• Railway Facilities Safety Joint Innovation Div. (KR-KORAIL) - Establishment of management system for cooperation on safety and reorganization of roles • Railway R& consultative group (12 companies)	• Removal of railway facility safety risk factors - Discovered and implemented 3 strategic directions and 10 strategic tasks • Received the 10 Major Railway Technology Award in 2019 (2 cases)
Value-sharing group	Railway passengers, the people, etc.	• People participated cooperation • Improvement of people's quality of life	• Diversification of participatory programs for innovation with the people	• Youth Participation Group • Budget Abuse Report Center	• KR Citizen's Innovation Group • KR Public Mentor Group	• Public-participation railway policy proposal • SNS Citizen Reporter Group • Integrity Ombudsman	Passengers	• KR Citizen's Innovation Group (19 persons, 4 meetings, etc.) • KR Public Mentor Group (100 persons, as necessary) • Public-participation railway policy proposal (as necessary)	• Supplementation of innovation plan and monitoring of 25 innovation tasks • Selection of important tasks and sustainability management materiality assessment • Application of the public suggestions (252 ideas in total)
							People	• Operation of Youth Participation Group (the public participation communication project) (28 persons) • Sharing of policy on use of SNS, newsletter and company magazine • Integrity Ombudsman (16 persons, 4 regular meetings, etc.)	• Discovery and implementation of 7 social value action tasks • 1,290 pieces of SNS contents were posted (14% more year-on-year) • Comprehensive level of integrity rose for 4 consecutive years (from Level 5 to Level 2)

Classification of stakeholder and communication channel

Global Competitiveness Reinforcement Forum

Gang Juhyun, Representative

KR plays a pivotal role in development of the national economy through establishment of national infrastructure and leads the transportation revolution in Korea by localizing core technologies for the 4th Industrial Revolution and expanding into overseas markets. KR also creates shared value based on human rights, integrity, safety, labor-management cooperation and shared growth by communicating with various stakeholders. Especially, establishing a human rights management system; conducting human rights impact assessment; achieving a level higher integrity from the yearly public institution integrity assessment; achieving the first place in civil service handling by MOLIT; creating a mutual growth cooperation fund for mid-to-small companies suffering from COVID-19; and global social contribution activities to promote the excellence of Korean railway technology through overseas railway schools are exemplary examples of sustainable management focused on stakeholders for other institutions.

Safety Engineering Department, Dongkuk University

Professor Kim Dongchoon

KR has been the driving force for development of the national economy since the opening of the first high-speed rail in 2004, and the Korean railway is now internationally recognized for its excellence. For the sustainable development of the railway industry, the most important value of 'safety' should always be the top priority. Railway has many advantages as a future means of transportation, as it has many advantages in terms of eco-friendliness, regularity and mass transportation. I hope that KR will lead sustainable growth of Korean railway by securing railway safety and expanding investment in improvement and maintenance of deteriorated railway facilities.

Korea Venture Business Women's Association

Kim Hakseop, General Manager

KR is responsible for the future of Korea's railway industry and for KR to continue to grow, the foundation for win-win cooperation should be expanded. Recently, KR signed the voluntary win-win cooperation company agreement with Ministry of SMEs and Startups and established startup support facilities. Also, KR is operating daycare centers in railway stations. These are good examples of win-win cooperation and social value creation. On the other hand, it is important to work with SMEs to develop new technologies and products and to secure growth engines. The various demands from in and outside, including safety, speed, environment and customer satisfaction, and the need for technological advancement following the 4th Industrial Revolution can be satisfied by cooperating with excellent SMEs. I hope that KR will further enhance the value of shared growth by leading cooperation with SMEs in the future.

Samcheok-si

Sim Haeyoung, Officer

Samcheok-si in Gangwon Province and KR have created Samcheok Jangho National Leisure Campground worth KRW 4 billion as a pilot project for regional win-win cooperation using idle railway sites. It was opened with facilities such as caravans, auto camping sites and camping grounds, and has become a luxury facility that tourists visit throughout the four seasons. The project to utilize idle land of KR through cooperation with local governments greatly contributes to the revitalization of the local economy by creating new jobs in the region and generating profits from local commercial districts. In the future, it is important to continue to present utilization methods of using idle railway sites customized to local conditions with national and local governments, and to support the establishment and implementation of plans suitable for regional conditions of use. By expanding the use of idle land, KR will be able to play an important role in balanced national development by improving the living environment of local residents and creating jobs.

Daejeon Citizen's Solidarity for Participation and Autonomy

Kim Youngjin, Representative

KR, as an organization that builds national infrastructure, plays an important role in future issues such as global network and North Korea projects and strives to create sustainable models within the railway industry. In particular, the importance of a de-carbonized society has been emphasized recently, and the government's Green New Deal policy has also called for the promotion of projects considering sustainability, including environment, health and safety. As a result, if KR secures eco-friendly technologies for building eco-friendly railways, green remodeling of railway stations and improving energy efficiency, it will be able to improve its corporate value internationally. In addition, KR will be able to born again as a trusted public institution through construction of railway considering health and safety of the people and thorough management of workers' safety and health issues and by actively responding to COVID-19 issues.

Management-Labor Joint Committee, KR

Lee Wonhee, a member

I think KR respects labor union as a management partner and builds cooperative labor-management relations in line with the government's pledge to "realize a society of respect for labor". The mutual trust between labor and management creates positive synergy in the working environment of employees, and the typical examples are the establishment of a system for protecting union members from work accidents, increasing welfare budgets, building the KR Training Center and regularizing meetings of labor-management delegations. A good organizational culture is a direct factor to KR's performance and corporate value, and I hope that KR will continue to recognize the importance of labor-management relations and make efforts to improve working conditions and maintain sustainable management through the establishment of win-win labor-management relations.

Materiality Assessment

KR is trying to achieve sustainable development by applying economic, social and environmental issues to all areas of management. We have selected important issues according to the materiality assessment method recommended by ISO 26000 and GRI Standards to focus our management efforts onto the issues important to our employees and stakeholders.

Materiality Assessment process

KR analyzed internal and external environments and conducted materiality assessment based on the context of sustainability, importance, completeness principle and stakeholder participation suggested by GRI to select important sustainability management issues.

STEP 1 IDENTIFICATION Internal and external environment analysis

- Benchmarking: Analysis of the sustainability management report published by Korean and foreign companies in similar business category and the companies recognized for excellent sustainability
- Media analysis: analysis of sustainability management issues exposed through the media for recent three years

STEP 2 PRIORITIZATION Materiality Assessment

- Relevance evaluation: Evaluation of relevance of the issue identified by internal and external environment analysis
- Significance evaluation: Selection of important issues by asking opinions of internal employees and external stakeholders

STEP 3 VALIDATION Effectiveness verification

- Confirmation of appropriateness of scope, boundary and period: Review of effectiveness of selected important issues and decision on level of report on scope, boundary and period

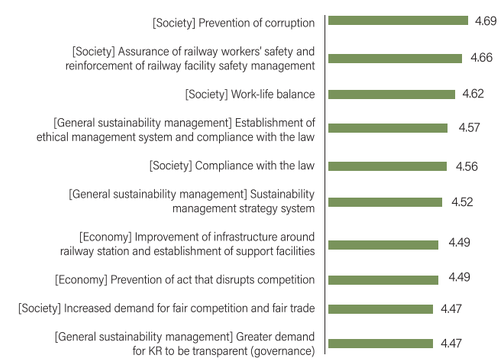
STEP 4 REVIEW Internal and external review

Employee and stakeholder survey
: Reviewed the adequacy of scope, boundary, period, activity, contents, etc. through meetings with internally responsible persons based on the result of analysis.

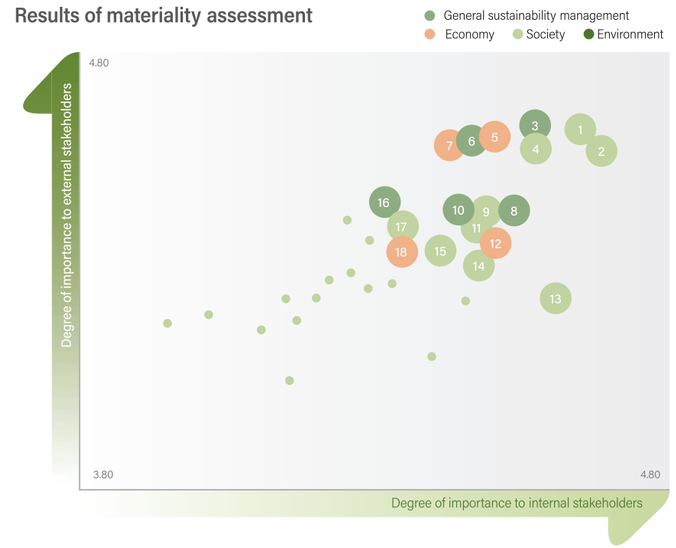
Verification by a third party
: Asked a third-party verification institution to review the appropriateness of the report writing process and the effectiveness of data.

Top-10 issues important to external stakeholders

Top 10 issues important to internal stakeholders



Results of materiality assessment



Selection of issues important to KR

Rank	Important issue	GRI TOPIC	Reporting boundary		Previous year's rank
			Internal	external	
1	Assurance of railway workers' safety and reinforcement of railway facility safety management	GRI 403: Occupational Health and Safety	●		1
2	Prevention of corruption	GRI 205: Anti-corruption	●		2
3	Establishment of ethical management system and compliance with the law	GRI 205: Anti-corruption	●		4
4	Compliance with the law	GRI 419: Non-compliance with laws and regulations in the social and economic area		●	3
5	Prevention of act that disrupts competition	GRI 206: Legal actions for anti-competitive behavior, anti-trust, and monopoly practices		●	6
6	Greater demand for KR to be transparent (governance)	-		●	5
7	Reinforcement of railway related technology R&D	-	●		6
8	Sustainability management strategy system	-	●		12
9	Increased demand for fair competition and fair trade	GRI 206: Legal actions for anti-competitive behavior, anti-trust, and monopoly practices		●	10
10	Management of economic, social and environmental risks	-	●		14
11	Increased demand for safety of service and product	GRI 416: Customer Health and Safety		●	9
12	Improvement of infrastructure around railway station and establishment of support facilities	GRI 203: Indirect Economic Impacts		●	13
13	Work-life balance	-	●		8
14	Greater importance of securing talents	-	●		11
15	Spreading socially responsible management, such as environmental and safety management, to the supply network (partner companies, etc.)	-		●	22
16	Stakeholder participation (expansion of communication channel and response to concerns)	GRI 201-40 ~ GRI 201-43		●	19
17	Support for and promotion of shared growth with partner companies and mid-to-small companies	-		●	28
18	Environmental damage (air, water and soil pollution)	GRI 306: Waste, GRI 305: Emissions		●	17

KR Sustainable

APPENDIX

- Sustainability Management Performance
  - Economic, Social and Environmental Performance Indices
- GRI/ISO 26000 Index
- Independent Assurance Report
- UN-SDGs & UNGC
- Awards and Association Memberships

Sustainability Management Performance

Economic Performance

Summarized Financial Position

Classification		Unit	2017	2018	2019
Assets	Current assets	KRW 100 million	6,079	4,144	5,062
	Non-current assets	KRW 100 million	176,584	178,499	182,997
	Total assets	KRW 100 million	182,663	182,643	188,059
Liabilities	Current liabilities	KRW 100 million	36,334	32,156	35,494
	Non-current liabilities	KRW 100 million	164,901	167,470	167,809
	Total liabilities	KRW 100 million	201,235	199,626	203,303
Equity	Basic properties	KRW 100 million	-	-	-
	Deficit	KRW 100 million	**(18,410)**	**(16,758)**	**(15,041)**
	Other equity components	KRW 100 million	**(162)**	**(225)**	**(203)**
	Total equity	KRW 100 million	**(18,572)**	**(16,983)**	**(15,244)**

Summarized Income Statement

Classification	Unit	2017	2018	2019
Sales	KRW 100 million	14,530	16,516	16,256
Cost of sales	KRW 100 million	7,283	9,124	8,952
Gross profit	KRW 100 million	7,247	7,392	7,304
Operating profit	KRW 100 million	7,247	7,392	7,304
Non-operating income	KRW 100 million	7 71	637	623
Non-operating expense	KRW 100 million	6,803	6,377	6,210
Net profit	KRW 100 million	1,215	1,652	1,717

Government Contribution

Classification	Unit	2017	2018	2019
Government contribution	KRW 100 million	57,528	36,596	41,121

Distribution of Economic Value

Classification		Unit	2017	2018	2019
Creation of economic value	Sales, government contribution, bond issuance, etc.	KRW 100 million	119,453	105,371	95,895
Distribution of economic value	Partner Companies (investment project orders)	KRW 100 million	20,195	18,035	23,459
	Financial expense (principle and interest, etc.	KRW 100 million	28,195	29,640	27,923
	Employees (labor cost)	KRW 100 million	1,255	1,377	1,462
	Government (tax and due)	KRW 100 million	142	101	227
	Operation expense of KR (current cost, etc.)	KRW 100 million	354	461	522

Social Performance

Employment

Classification		Unit	2017	2018	2019
Executives and employees (actual)	Total	Person	1,417	1,828	1,940
Executives and employees (actual)	Regular position	Person	1,417	1,488	1,636
	Contract workers	Person	12	340	304
	Non-regular position	Person	22	22	13
Age	20~29 years old	Person	161	242	343
	30~39 years old	Person	225	309	377
	40~49 years old	Person	497	554	503
	50~59 years old	Person	523	717	711
	Over 60 years old	Person	11	6	6
Minority	Female employees	Person (%)	219(15.4)	240(13.1)	288 (14.8)
	Female employees serving as department head and higher positions	Person (%)	3(0.2)	3(0.2)	6(0.3)
	Female employees serving as senior manager and higher positions	Person (%)	32(2.2)	40(2.1)	43(2.2)
	Employees with disabilities	Person (%)	49(3.4)	57(3.1)	77(3.9)
New employment	Total	Person	51	108	244
	Employees with disabilities	Person	0	8	27
	Female employees	Person	12	21	36
	High school graduates	Person	8	5	17
	Vocational high school graduates	Person	5	4	11
	Science and engineering graduates	Person	45	70	182
	Local talents	Person	22	41	123
Turnover	Turnover rate	%	0.7	0.4	1.2%
	Regular retirement	Person	9	30	48
	Voluntary retirement	Person	21	31	53
Average years of service		Years	17.9	18.2	13.4

Employees by job functions

Job function	Employees	2017	2018	2019
Administrative	Person	403	472	507
Civil engineer	Person	457	474	582
Architect	Person	78	81	105
Electrical engineer	Person	216	227	258
Communication engineer	Person	61	60	75
Mechanical engineer	Person	80	77	89

Labor Union

Name of labor union	Date of establishment	No. of union members	No. of employees eligible for labor union	No. of dedicated members
Korea National Railway Labor Union	2005.6.9	1,650	1,729	6
Korea Railway Corporation Labor Union	2017.11.30	10	1,739	0

Sustainability Management Performance

Social Performance

Job Creation

Classification	Unit	2017	2018	2019
Activation of rail business	Person	67,443	67,634	72,369
Partnership with the private sector	Person	3,869	6,018	4,861
Underprivileged class	Person	180	179	175
Youth interns	Person	179	80	92

Support for SMEs

Classification	Unit	2017	2018	2019
Rate of purchasing SME products	%	35.5	36.6	39.9
Supports for joint R&D projects/No. of participating companies	Case/companies	10 cases / 12 companies	5 cases / 13 companie	8 cases / 10 companie

Training Hours and Investment

Classification	Unit	2017	2018	2019
Time spent on training per employee	Hour	137	109	111
No. of trainees	Person	1,424	1,430	1,586
Investment in training per employee	in KRW thousand	1,180	960	1,312

Welfare Benefit and Safety

Classification	Unit	2017	2018	2019
Employee satisfaction	Point	78.0	77.6	81.9
Employees who used childcare leave	Person	29.0	25.0	37.0
Rate of return to work after childcare leave	%	100.0	100.0	100.0
12-month service after return to work	%	100.0	94.0	100.0
Safety and security accidents	Case	0	0	0

Flexible Work System

Classification	Unit	2017	2018	2019
Flextime work system	Person	14	18	68
Flexible work system	Person	246	245	305

Customer Satisfaction

Classification	Unit	2017	2018	2019
Satisfaction on complaints treatment through the e-People system	Point	59.8	59.2	63.6
Partner Company satisfaction	Point	85.5	94.7	95.8
Public Customer Satisfaction Index (PCSI)	Point	90.8	91.0	90.7

Industrial Safety

Classification	Unit	2017	2018	2019
Accident rate	%	0.4	0.4	0.7
Average accident rate in the construction industry	%	0.8	0.9	1.1
Accident index	Person	100	117	167

Ethical Management and Violation of Laws

Classification	Unit	2017	2018	2019
Comprehensive integrity index of the Anti-Corruption & Civil Rights Commission	Point	7.98	8.46	8.79
Anti-corruption practice evaluation of the Anti-Corruption & Civil Rights Commission	Rating	2	2	2
Violation of laws	Case	없음	없음	없음

Social Contribution

Classification	Unit	2017	2018	2019
Time spent on social contribution per employee	Hour	12.3	10.5	8.3
Donation	KRW 100 million	3.1	2.9	3.3

Sustainability Management Performance

Environmental Performance

KR (Head Office and Regional Offices)

Energy Consumption

(in TJ)

Classification	Unit	2017	2018	2019
Building	TJ	70.5	75.16	69.75
Vehicle	TJ	8.76	8.70	9.26

Water Consumption – Water Supply

Classification	Unit	2017	2018	2019
Water consumption	ton	44,340.0	46,961.0	43,297.0

GHG Emissions – Building, Vehicle

Classification	Unit	2017	2018	2019
Building (Direct)	tCO_2 eq	687.7	725.8	522.5
Building (Indirect)	tCO_2 eq	2960.7	2962.0	2893.3
Vehicle	tCO_2 eq	613.5	607.3	648.5

Designated Waste Emission

Classification	Unit	2017	2018	2019
General waste (including recycling)	ton	158.8	158.5	152.4
Designated waste (including recycling)	ton	20.0	18.0	26.0
Construction waste (including recycling)	ton	41.8	0.0	0.0
Recycled amount	ton	94.2	62.5	57.6

Major Environmental Indicators

Indicator	단Unit	2017	2018	2019
Environmental management index	Point	347.2	355.6	378.4
Rate of GHG emission	%	25.1	30.0	33.7
Violation of environmental regulation	Case	3.0	3.0	0.0
Rate of Construction waste recycling	%	95.7	98.8	94.7

Railway Construction Site (Partner Companies)

Energy Consumption

Classification	Unit	2017	2018	2019
Building	TJ	384.4	260.4	390.7
Vehicle	TJ	235.4	161.2	195.1

Raw Material Consumption

Component		Unit	2017	2018	2019
Rebar		ton	370,641.0	284,496.0	258,519.2
Rail	New materials	ton	38,601.0	23,467.0	35,581.0
	Recycling	ton	156.0	236.0	649.0
PC sleeper	New materials	pieces	590,476.0	219,303.0	353,855.0
	Recycling	pieces	22,114.0	6,967.0	15,783.0
Wooden sleeper	New materials	pieces	520.0	4,861.0	28.0
	Recycling	pieces	480.0	1,900.0	0.0
Aggregate	General	ton	2,837,743.0	1,282,596.0	1,917,252.3
	Rotate	ton	31,366.0	18,966.0	54,914.5
Formwork	Wood	m^3	1,379,619.0	1,257,546.0	1,806,756.7
	Alternative material	m^3	1,703,017.0	1,038,674.0	2,271,886.5

Water Consumption

Classification	Unit	2017	2018	2019
Total	ton	2,456,071.8	2,514,179.9	1,606,550.3
Recycled water	ton	47,697.0	8,212.0	955.0

GHG Emission

Classification		Unit	2017	2018	2019
Building	Indirect	tCO_2 eq	18674.0	12197.1	11208.6
	Direct	tCO_2 eq	1598.2	1559.3	8347.2
Vehicle	Direct	tCO_2 eq	13347.9	11204.5	13531.3

Waste Emission

Classification		Unit	2017	2018	2019
Construction waste	Emissions	ton	754975.6	694382.3	593341.1
	Recycled	ton	722504.4	686141.3	561625.2
Worksite waste	Emissions	ton	292597.0	230783.0	190359.9
	Recycled	ton	178843.3	208391.0	136053.3
Designated waste	Emissions	ton	17272.0	15709.0	5201.3
	Recycled	ton	5633.0	105.0	54.9

Water Pollutants Emission

Classification	Unit	2017	2018	2019
Annual wastewater emission	ton	11,959,154	8,653,491	9,354,627
Operation of wastewater emission facilities	location	189	144	122

GRI Standard Index

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Independent Assurance Report

TO THE MANAGEMENT OF KOREA NATIONAL RAILWAY

The Institute for Industrial Policy Studies (hereinafter "Auditor"), hereby presents the following statement of assurance, upon the request for auditing the 2019 Sustainability Report (hereinafter "Report") of the Korea National Railway (hereinafter "KR") as a licensed sustainability assurance provider.

Responsibility & Objective

KR is responsible for economic, environmental, and social dimensions of performance measures and all statements contained in this report. The objective of the assurance is to offer professional counsel for improving the quality of the report by; checking whether there were any errors or bias present in the Report; by assessing whether the data collection system is in appropriate working order; and by examining the process of identifying issues of material importance to sustainability management.

Assurance Type & Level

The Auditor referred to AA1000AP (2018)1, ISAE30002 , and GRI Standards3 for the assurance of the Report.

Assurance Scope	Economic, environmental and social dimensions of the report's performance measures and objectives
Assurance Type & Level	Type II - Moderate level
Assurance Criteria	· "IPS Assurance Manual" to verify compliance against the four core principles of AA1000AP (2008) · "IPS Performance Indicators Assurance Criteria" to assess the reliability of performance indicators based on ISAE3000 · GRI Standards: The compliance of the "Core Option" criteria

Assurance Process and Activities

The Auditor confirmed ① the inclusivity, materiality, responsiveness, and impact of the reported content; ② the reliability of the reported performance data; and ③ the GRI Standards "In accordance" criteria.

- Review of KR's identification process of material issues and following results
- Review of the stakeholder engagement process
- Review of data samples, other than financial statements, used as sources for economic, social and environmental quantitative performance measures
- Review of reference materials underlying economic, social and environmental qualitative performance measures
- Review of the Report's compliance with GRI Standards

The Auditor conducted written correspondence and in-person interviews with the reporting management and staff within KR, in the process of assurance measures, and the reporting management and staff within KR appropriately accepted the Auditor's requests for correction and opinions.

Assurance Findings

The Auditor discussed about the Report's editing with KR though written correspondence and in-person interviews and reviewed the final draft of the Report to confirm whether our requests and recommendations for revision were reflected. As a result, the Auditor could not find any contents violating the following assurance principles, or any evidence showing major errors or bias in the performance information or claims stated within the assurance scope.

[Inclusivity] Were KR's stakeholder engagement plans and processes appropriate?

It is the Auditor's view that KR has put in place a process for stakeholder engagement to better reflect stakeholder views in its actual management activities, in recognition of the importance of communication and cooperation with stakeholders for pursuing sustainability management. It has been confirmed that the Public Participation Innovation Corps and the People Mentor Group, as well as 'Railway Facility Safety Joint Innovation Group' newly established to strengthen railway facility safety management, are particularly representative processes for listening to the opinions of KR's core stakeholders. The Auditor has not found any important stakeholders left out from this process.

[Materiality] Does the Report offer substantive information of material importance to KR's economic, environmental and social stakeholders?

The Auditor confirmed that KR is identifying material issues affecting both stakeholders and management activities of the Authority and is appropriately disclosing the management status of those issues. In particular, the identification of sustainability issues through materiality analysis and the facilitation of methods to prioritize material issues through stakeholder survey results appear to be KR's core "materiality assessment process." No omissions were discovered by the Auditor, in terms of sustainability management information important to stakeholders.

1 AA1000 – Accountability Principles 2018: One of the sustainability report assurance standard series established by the non-profit organization AccountAbility based in the UK, in order to audit corporate social responsibility and sustainability development, thus explaining a set of auditing principles. It was revised with the addition of the "Impact" principle to the existing AA1000APS (2008) in 2018.

2 International Standard on Assurance Engagements 3000: "Assurance Engagement Principle other than Audits or Reviews of Historical Financial Information" established by the International Federation of Accountants (IFAC)

3 The Global Reporting Initiative (GRI) is a non-profit organization established in 1997, by the Coalition for Environmentally Responsible Economies (CERES) and the United Nations Environment Programme (UNEP), releasing a sustainability reporting framework in 2000 for multinational enterprises. Following the revised G4 version focused on supply chain, governance, ethics & integrity, anti-corruption, GHG emissions & energy disclosures, the GRI released the GRI Standards in 2016, a new guideline with modular structure to ensure more systematic reporting process

[Responsiveness] Does the Report provide an adequate response to stakeholder demands and interests?

The Auditor confirmed that KR is operating diverse engagement channels appropriate for each key stakeholder and is identifying material reporting issues through those opinions collected in the process. The introduced themes of "Securing the Safety of Rail Workers and Enhancing the Safety Management of Rail Facilities" were found to be areas of high stakeholder interest. It has been found in this process

[Impact] Does KR identify and measure economic, social, and environmental impacts on stakeholders and disclose the results through the Report?

It is the Auditor's opinion that KR is appropriately disclosing economic, environmental, and social impacts through analysis of ripple effects on local economies, inspection of effects on rail facilities, and evaluation of effects on climate change through the Report. Moreover, the Auditor confirmed that KR conducts fact-findings on its employees and partner companies related to human rights issues in the process of human rights management and analyzes their social and environmental impacts on stakeholders in the aspect of business operation and major projects.

[Criteria for compliance with GRI Standards]

The Auditor has recognized that the Report is in accordance with the "Core Option" criteria of the GRI Standards. ('In accordance with the GRI Standards: Core option')

[Reliability of Performance Indicators]

The Auditor confirmed that the performance indicators presented in the Report are free from bias or error that would affect stakeholders' judgement of KR. Followings are the key performance indicators the Auditor has recognized.

Category	Issue	Performance Indicators
Special Report #1	Ensure safety of railway workers and strengthen railway facility safety management	Level A from the public institution safety activity level evaluation (the highest level) (New) operation of Railway Facilities Safety Joint Innovation Div.: improved 11 systems
Shared growth	Support partner companies/SMEs and promote shared growth	· Reinforcement of financial support: Increased the size of shared growth fund from KRW 10 billion to KRW 20 billion · Broadened the opportunity to participate in biddings: Increased the private contract limit
Eco-friendly railway	Environmental damages (air, water and soil pollution)	KR's greenhouse gas reduction rate: 33.7%
Strengthening railway R&D	Strengthen R&D of technologies related to railways	Level of Korean technology: 85.5% of the technology level of advanced country per railway technology item
Vitalization of organizational culture	Work-life balance	Rate of male employees on child raising leave: 40% (the rate of male employees out of all workers who took the child raising leave)
Ethical management	Prevention of corruption	Achievements of promoting ethical management: Carried out KR's own integrity inspection Level 2 from comprehensive integrity inspection (the highest level ever)

* Reviewed the qualitative (16) and quantitative (31) achievement indicators on 18 issues and only a portion of achievement indicators were stated in the verification opinion.

Recommendations

The Auditor highly values the Report's endeavor to ① establish material issues closely associated with KR's four core values; ② appropriately reflect the key interests of every stakeholder through the Public Participation Innovation Corps, People Mentor Group, stakeholder interview, and surveys; ③ transparently and objectively state the past achievements of KR in terms of balance; and ¨ê transparently disclose the Authority's economic, environmental, and social performance improvement based on internal and external sustainability agendas including social value realization, human rights management, the UN SDGs, and the Ten Principles of UNGC. Recommended in future reports with better quality are the followings:

Clarity: Explaining technical terminologies and English abbreviations used in the railway industry, adding the basis and formula for calculating ripple effects

Accuracy: Securing a system to manage basic data including the number of employees which are subject to change due to source, gathering criteria, and disclosure condition

Comparability: Providing comparable benchmark data of public corporations under the Ministry of Land, Infrastructure, and Transport or peers when presenting performance indicators

Independence of the Auditor

The Auditor does not have any for-profit or commercial affiliation with KR and did not involve in any of the preparations of the Report, with the exception of this third party assurance statement.

Qualifications of the Auditor

The Institute for Industrial Policy Studies is a "Third Party Assurance Provider" engaging in sustainability report assurance for corporations and public organizations nationwide. The auditing team participating in the assurance of this report consists of experts specialized in disciplines of business administration, economics, and accounting, and also with many years of accumulated experience and professional training in the fields of ethical management, human rights management, CSR, and sustainability.

AA1000
Licensed Assurance Provider
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IPS

August 2020
Chairman of the Institute for Industrial Policy Studies
Tae Hyun Kim

Implementaton of UN SDGs

SUSTAINABLE DEVELOPMENT GOALS

The UN's Sustainable Development Goals (UN SDGs), suggested in September 2015, are composed of 17 goals and 169 targets that the international community should achieve during the next 15 years (2016-2030), and these goals contain the concept of development that meets the needs of future generations as well as the needs of today. KR positively supports the UN SDGs, which have been established to change our world into a better place, and also wants to contribute to the achievement of the SDGs through understanding the chances for future business in response to the challenges involved in sustainable development, and through strengthening the value of sustainability.

UN SDGs Goal	KR's Major Activities
Goal 1 No poverty	Reinforcement of support for vitalization of social economy Creation of customized job opportunities for the socially vulnerable class, mid-to-small companies, etc. Achieved ZERO overdue payment in all railway sites through a company-wide overdue payment prevention campaign
Goal 5 Gender equality	-Received the family-friendly institution certificate from Ministry of Gender Equality and Family for 5 consecutive years (2015~2019) Implemented 'Mom-friendly KR' system to be considerate to pregnant employees
Goal 7 Affordable and clean energy	Acquired 'Zero-energy Certificate' from Korea Energy Management Corporation by applying new and renewable energy to railway station design Introduced ESS to maximize the use of new and renewable energy
Goal 8 Decent work and economic growth	Created jobs to reinforce safety management (127 jobs, 8.6% of total quota) Created about 73,000 jobs in the private sector through railway construction and facility improvement projects
Goal 9 Industry, innovation and infrastructure	Increased the number of railway lines to achieve balanced regional growth (total 9 lines, total length of 658.3km and total project cost of KRW 17 trillion 170.7 billion) Promoted the capital region wide-area express railway, GTX, to remove traffic congestion in large metropolitan regions (total 9 lines, total length of 292.49km and total project cost of KRW 20 trillion 998.5 billion)
Goal 10 Reduced inequalities	Sought to expand social equity employment, such as reinforcement of blind hiring, expansion of high school graduate hiring, etc. Ministry of SMEs and Startups appointed KR as an "Attentive Institution" for the first time among public institutions for KR's efforts on shared growth with mid-to-small companies Reinforced support for vitalization of social economy, such as hosting of flea market at Daejeon Station
Goal 11 Sustainable cities and communities	Carried out social contribution activities by establishing 'Publico Daejeon', a social contribution association by public institutions in Daejeon area Established business start-up platform using idle railway land, such the piece of land under railway bridge (Station-G and Station-A in Ansan, Food Start-up Center in Seoul Station, etc.) Implemented find dust reduction plans at 61 underground railway stations and railway construction sites that may generate fine dust
Goal 13 Climate action	KR was selected as 'an excellent public institution in reducing greenhouse gas' by exceeding the greenhouse gas management and reduction target Received an approval for the Greenhouse Gas Emissions Trading System Reduction Project for the first time in transportation sector in Korea
Goal 15 Life on land	Restored ecosystems by turning discarded Gyeongchoon Line and Donghae Nambu Line lands into parks Planted 1,500 trees in Geumgangmochi Village in Youngdong area at the '2019 Planting Trees of Hope' event

Joined UN Global Compact (UNGC)

UN GLOBAL COMPACT
COMMUNICATION ON PROGRESS

KR joined the UN Global Compact in 2007 and has been complying with the 10 principles in the 4 areas of human rights, labor, environment, and anti-corruption.

	Principle
Human Rights	Principle 1 Companies shall support and respect protection of internationally proclaimed human rights.
	Principle 2 Companies shall make sure that they are not complicit in human rights abuses.
Labor	Principle 3 Companies shall uphold the freedom of association and the effective recognition of the right to collective bargaining.
	Principle 4 Companies shall uphold the elimination of all forms of forced and compulsory labor.
	Principle 5 Companies shall uphold the effective abolition of child labor.
	Principle 6 Companies shall uphold the elimination of discrimination in employment and occupation.
Environment	Principle 7 Companies shall support a precautionary approach to environmental challenges.
	Principle 8 Companies shall undertake initiatives to promote environmental responsibility.
	Principle 9 Companies shall encourage development and diffusion of environmental-friendly technologies.
Anticorruption	Principle 10 Companies shall work against corruption in all its forms, including extortion and bribery.

Awards and Association Memberships

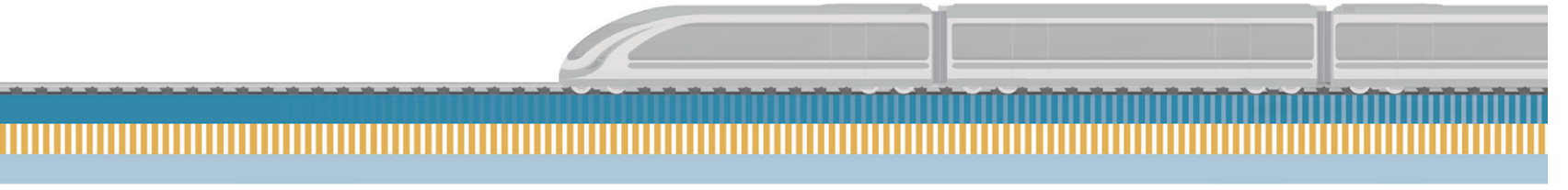
Awards/Commendations received in 2019

Achievement	Hosted by	Significance
Presidential Prize at the National Quality Control Circles for 10 consecutive years	Korea Standards Association Korean Agency for Technology and Standards	Improved land taking process enhanced efficiency and was selected as a beast practice (Aug. 2019)
Minister's Award from MOIS for excellent public service innovation in 2019	Ministry of the Interior and Safety	Opened daycare center at station for the first time to provide childcare for working parents (Nov. 2019)
Minister's Award from MOE for excellent greenhouse gas reduction achievement in 2019	Ministry of Environment	Greenhouse gas reduction effect of railways officially recognized and outsourced Emissions Trading Scheme Project approved (Oct. 2019)
Top 10 Railway Technology Award in 2019	Korea Association for Railway	Recognition given for smart electricity quality improvement devices and localization of HSR turnout technologyrecognized (Sept. 2019)
Received an achievement award with regard to Jakarta LRT Phase 1 Project in 2019	JakPro	Prepared foundation for the government's New Southern Policy by expanding projects in ASEAN countries (Jun. 2019)
Minister's Award from MPM for the 4th Active Administration Excellent Case in 2019	Ministry of Personnel Management	Recognition given for creating social value for using spces under elevated railways to set up start-up platformsrecognized (Oct. 2019)
Minister's Award from MOTIE for commercialization of innovative railway technology in 2019	Ministry of Trade, Industry and Energy	Became leader of innovative future technology by localizing the LTE-R based train control technology (Jun. 2019)
Received Grand Award in Super-large Tunnel Projects from KTA Tunneling Awards in 2019	Korean Tunneling and Underground Space Association	Noted for excellence of new tunneling method used in Yulhyun Tunnel on Suseo HSR (Apr. 2019)

Association Memberships

Memberships	Association
International Union of Railways (UIC)	Power Breakfast of KSA Daejeon
East Asia Railway Community Forum	Korea Project Management Association
Korea Association for Railway	Korea Planning Association
UN Global Compact Korea	Urban Design Institute of Korea
International Project Management Association Korea (IPMAK)	Korea Industrial Safety Association
Business Ethics and Sustainability Management Forum	Korean Association for Audit
The Korean Society of Safety	Korean Society of Transportation
Korea Project Management Association	Asosiasi Kontraktor Indonesia (AKI)
Architectural Institute of Korea	Korea Emergency Planning Officer Council
Korea Railway Association	International Contractors Association of Korea
Korea Industrial Technology Promotion Association	Korea Institute of Electrical Engineers
Korea Institute of Construction Safety	Daejeon Chungcheong Audit Conference
Korea Electric Engineers Association	Korea Standards Association
Korea Public Auditor Conference	Korea Management Association
Korea Public Institution Audit Conference	Korean Tunneling and Underground Space Association
International Contractors Association of Korea	The Association of Korean Contractors In Indonesia (AKCI)
Korea Fire Safety Institute	Korea Fire Safety Institute

KOREA NATIONAL RAILWAY



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