

Outlines of Railway Technical Research Institute (RTRI)

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CHARMEC

Railway Technical Research Institute (RTRI)



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Japanese Railways

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Railway Technical Research Institute (RTRI)

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History of Japanese Railways

- 1872** **British railway engineers brought railway in Japan**
The first operation between Tokyo and Yokohama (29 km)



History of Railways in Japan

- 1881** Establishment of Nihon Tetsudo Kaisha, the first Japanese private railway company
- 1948** Japan National Railways (JNR) was founded by a public corporation.
- 1964** Tokaido Shinkansen (Tokyo-Osaka) was opened with a standard gauge.
- 1987** JNR was privatised into 6 JR passenger companies and 1 JR freight company.



Japan Railways Group - JR Groups

-  Hokkaido Railway Company (HJR)
-  East Japan Railway Company (EJR)
-  Central Japan Railway Company (CJR)
-  West Japan Railway Company (WJR)
-  Shikoku Railway Company (SJR)
-  Kyushu Railway Company (KJR)
-  Japan Freight Railway Company (FJR)

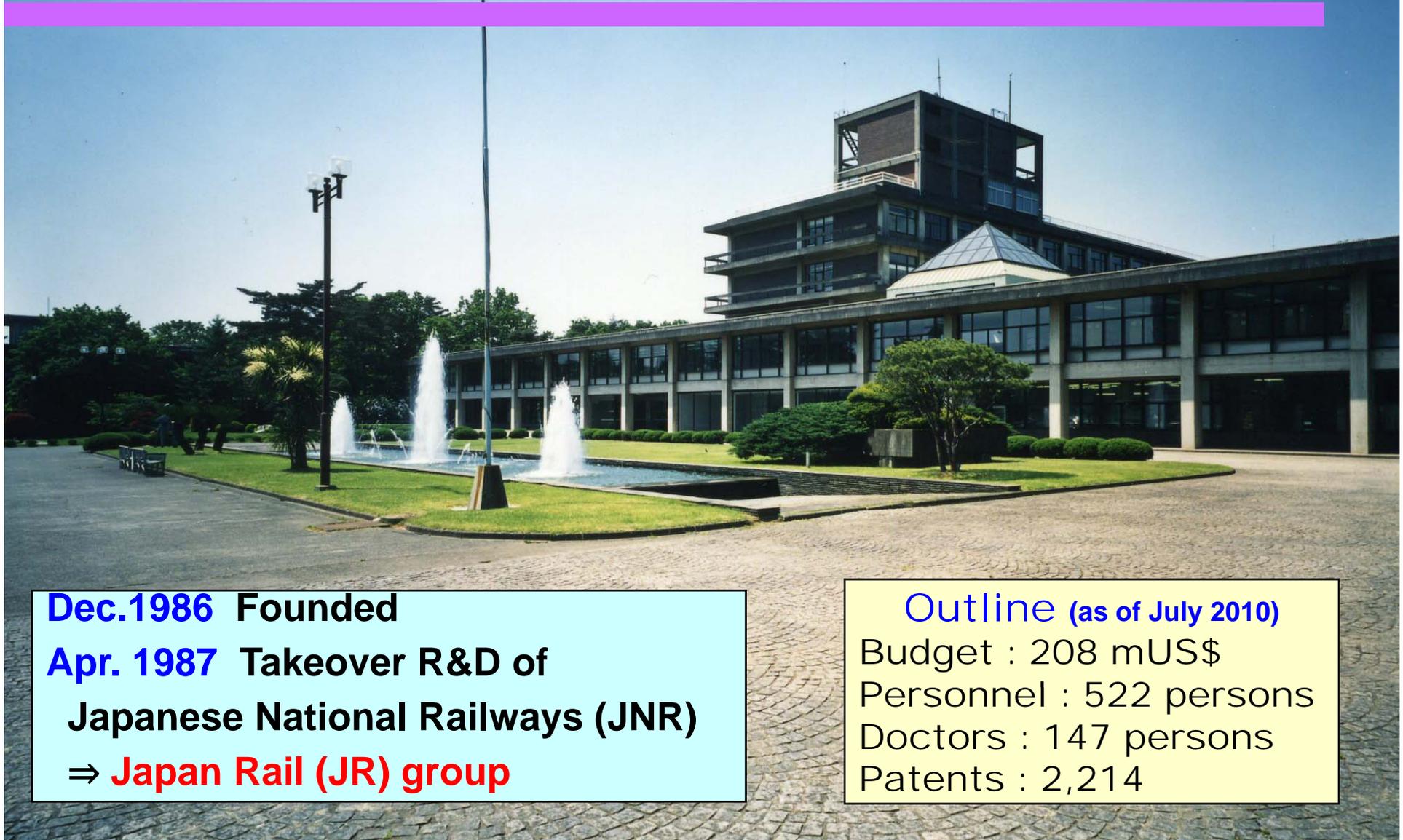
JR Information System

Japan Telecom
(Now, Soft Bank
Telecom)

Railway Technical
Research Institute
(RTRI)



Overview of Railway Technical Research Institute



Dec.1986 Founded
Apr. 1987 Takeover R&D of
Japanese National Railways (JNR)
⇒ **Japan Rail (JR) group**

Outline (as of July 2010)
Budget : 208 mUS\$
Personnel : 522 persons
Doctors : 147 persons
Patents : 2,214

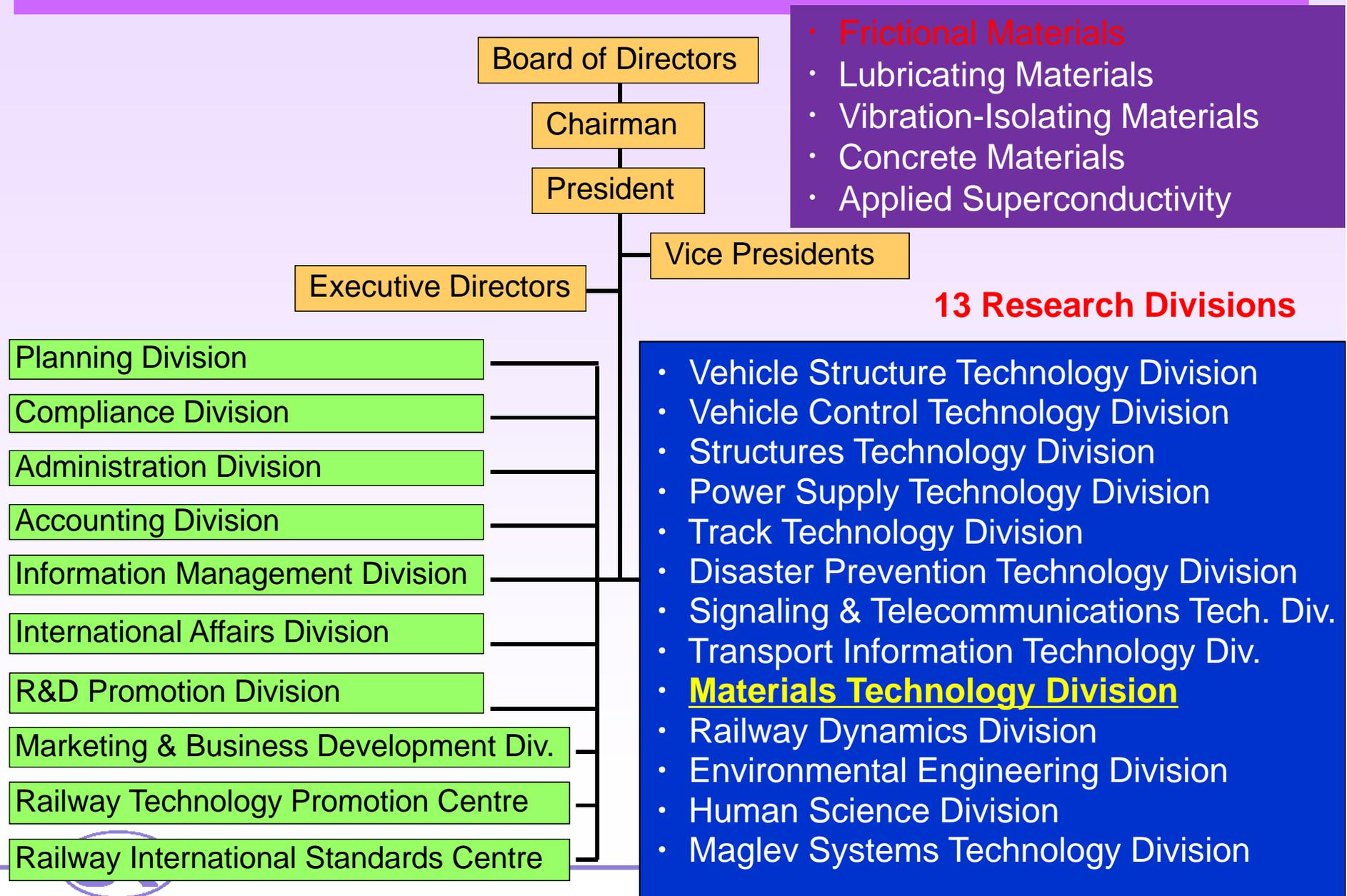


Funding

- **Contribution from JR group companies (0.35% of railway-related income)**
- **Subsidy from the government**
- **Contract revenue from private companies**



Organization of the RTRI



- **Frictional Materials**
- Lubricating Materials
- Vibration-Isolating Materials
- Concrete Materials
- Applied Superconductivity

13 Research Divisions

- Vehicle Structure Technology Division
- Vehicle Control Technology Division
- Structures Technology Division
- Power Supply Technology Division
- Track Technology Division
- Disaster Prevention Technology Division
- Signaling & Telecommunications Tech. Div.
- Transport Information Technology Div.
- **Materials Technology Division**
- Railway Dynamics Division
- Environmental Engineering Division
- Human Science Division
- Maglev Systems Technology Division

Master plan of the RTRI "RESEARCH 2010"

~ In pursuit of sustainable development for railways ~

RTRI has set out the following basic policies:

1. Creation of new technologies aimed at sustainable development of railways
2. Accurate and quick response to demand
3. Information transmission and dissemination of results from its activities
4. Inheritance of railway technologies and using foundation technologies as the basis for more advanced research
5. Demonstration of expertise in research across the whole railway engineering spectrum as a railway engineering

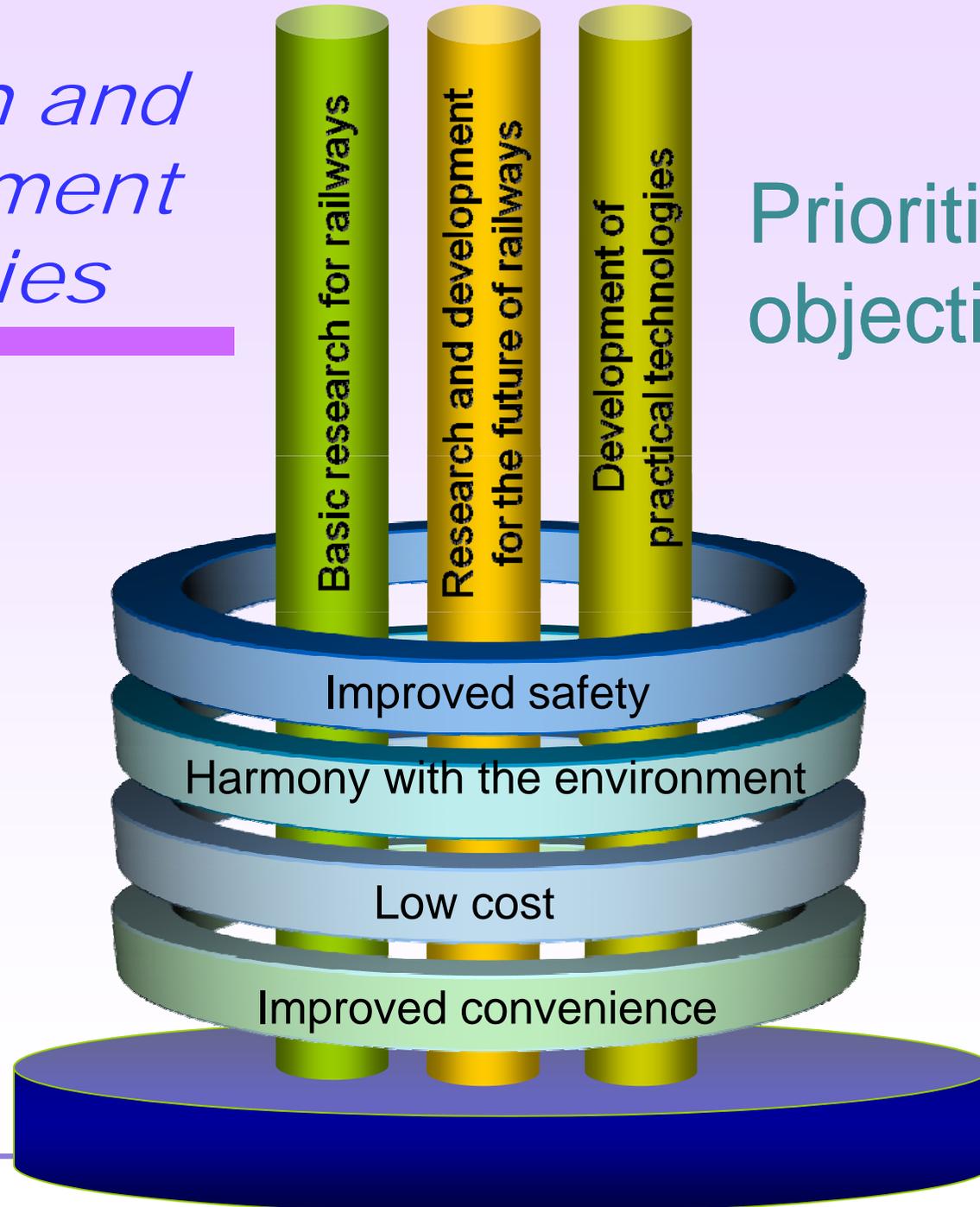
group



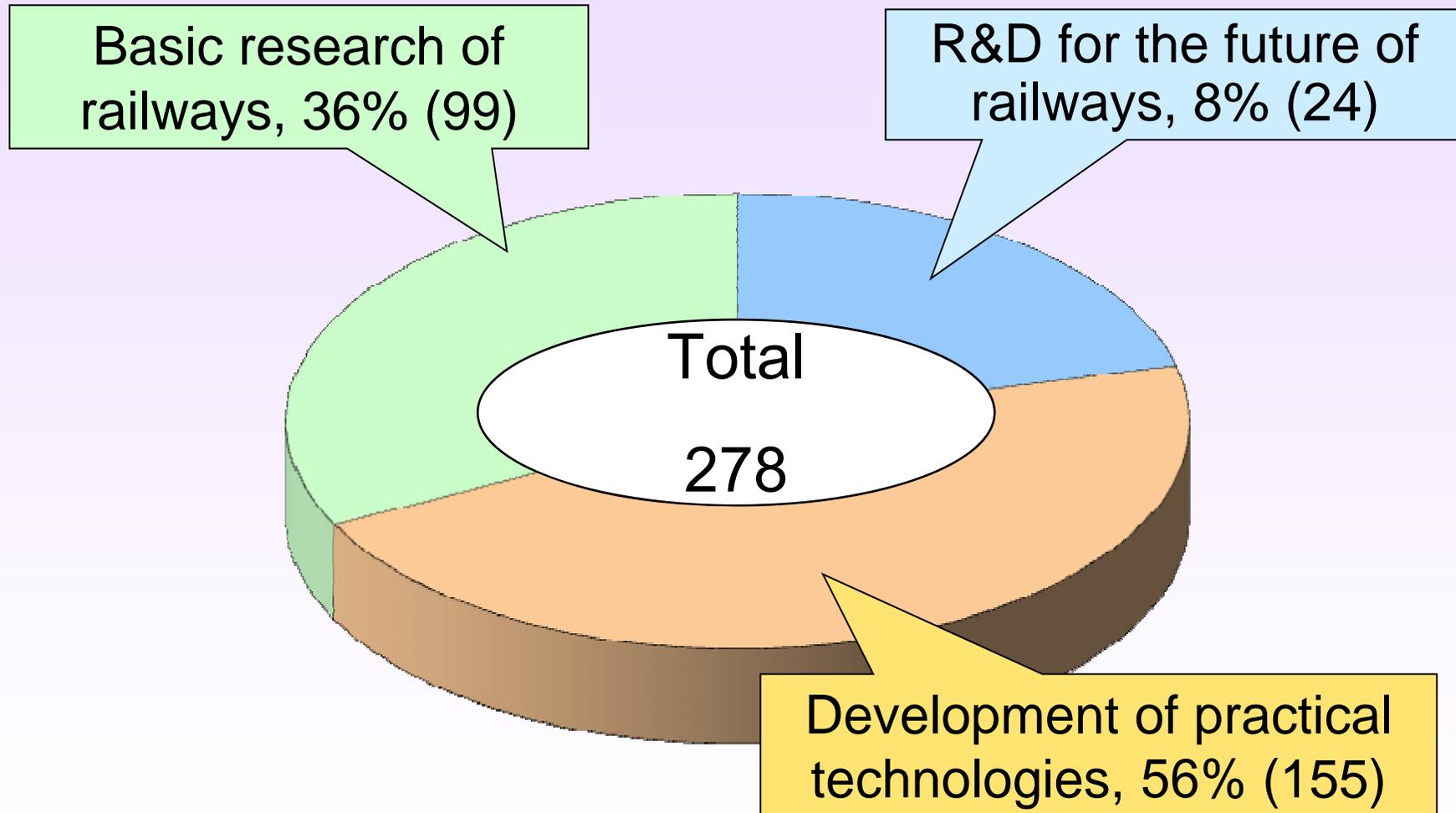
Research and development activities

Prioritized objectives

Targets



Number of R&D Projects in FY 2009



11



Rolling stock test plant

Purpose

- Test of **impossible condition** on actual lines
- Preliminary examination of newly designed trucks

Special features

- Test of **one vehicle** or one truck
- Vertical, lateral and rolling action

Maximum speed
- **500 km/h**



Rail wheel

Large-scale shaking table

Purpose

- R&D on seismic performance of rolling stock, tracks, structures

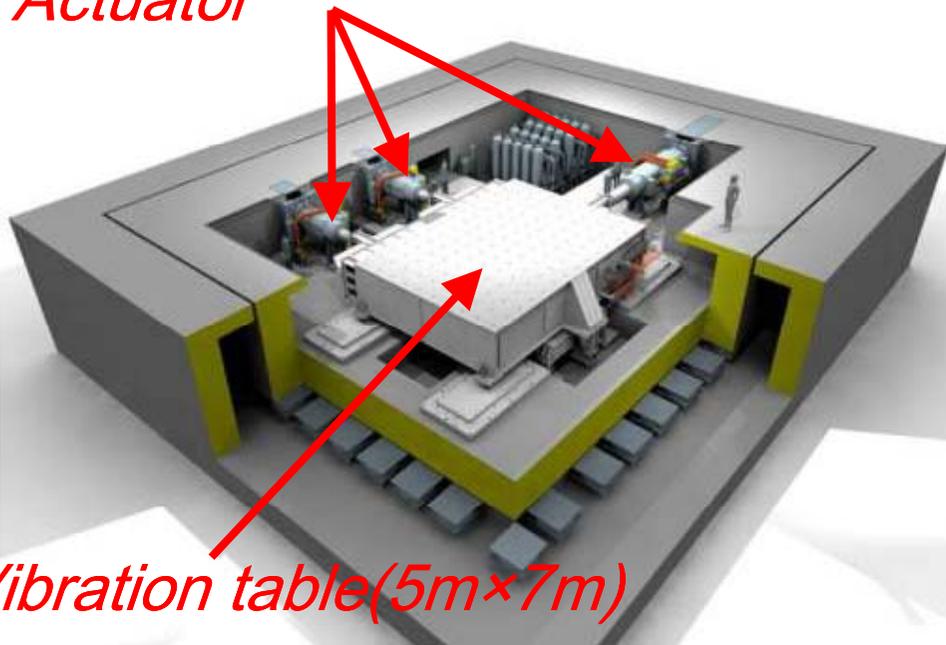
Special features

- Two-dimensional horizontal excitation (± 1 m)
- Maximum acceleration: ± 2000 gal
- Maximum surcharge weight: 500 kN

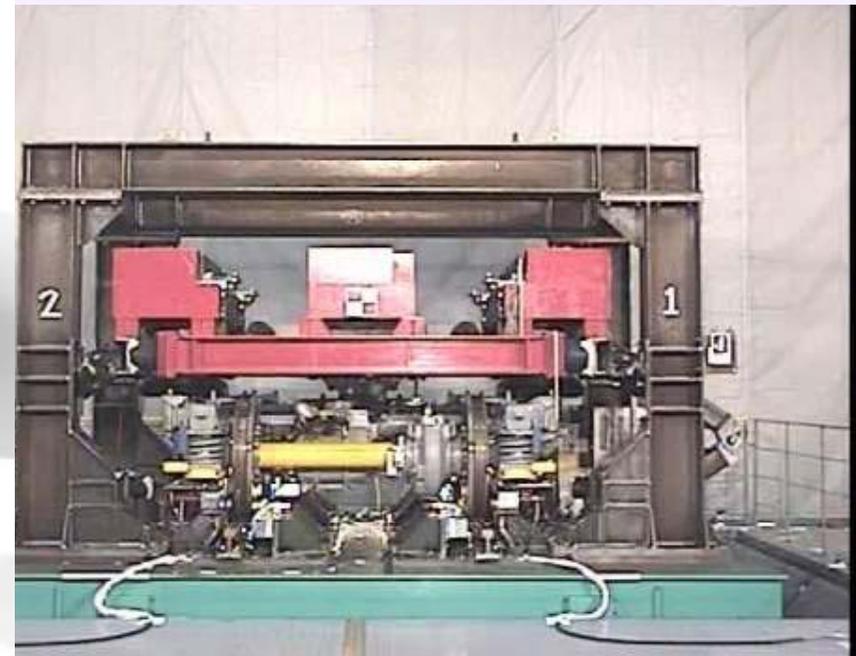
Video

13

Actuator



Vibration table (5m x 7m)



Wind tunnel technical center

- **Low-noise** performance unequaled in the world.
Background noise level: **75dB(A)**
- Highest wind velocity(**400 km/h**) for the large-scale and low-noise.
- Equipped with a high-speed(**216km/h**) moving belt ground plane.



Panoramic view of the center
(Maibara city)



Fan
(5m Diameter)



Automobile
on
moving belt



Current collection test

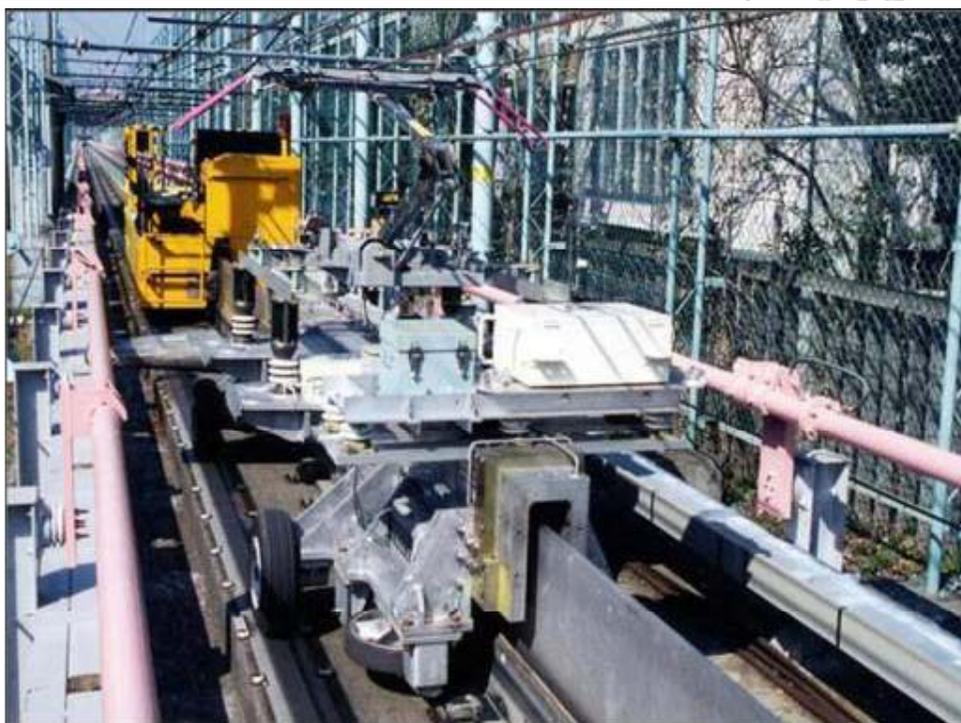
Purpose

- Test of **overhead contact line - pantograph** systems

Special features

- **500m-long** test track
- Maximum speed of **200 km/h**

Video



English Publication

RTRI : <http://www.rtri.or.jp/eng/index.html>

◆Quarterly Report of RTRI

Research Paper, Every three months

http://www.rtri.or.jp/eng/publish/qr_E.html

◆RTRI's Newsletter

(Railway Technology Avalanche)

Latest information of railway technology

Every 3 months

<https://webform.rtri.or.jp/ent/entry/index.html>

◆Annual Report

<http://www.rtri.or.jp/eng/rtri/annualreport.html>



You can download all of document by pdf files.



Railway Technical Research Institute

*Thank you very much for your kind
attention!*



Ride comfort simulator

Purpose

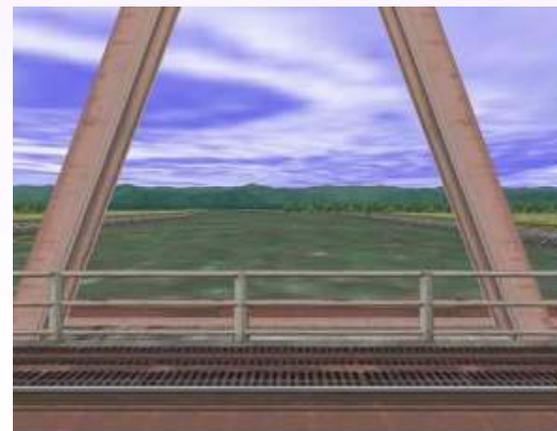
- Simulation of passenger riding quality.

Special features

- **Vibration, environmental factors** in and outside of cars.



Interior



Window view

Brake test stand

Purpose

- Test of brake performance of **brake disc**, **tread brake** and **adhesion** between rail and wheel

Special features

- Maximum speed of **500km/h** (**ø860mm wheel diameter**)
- **Snowy and wet condition**



Brake disc test unit Tread brake test unit



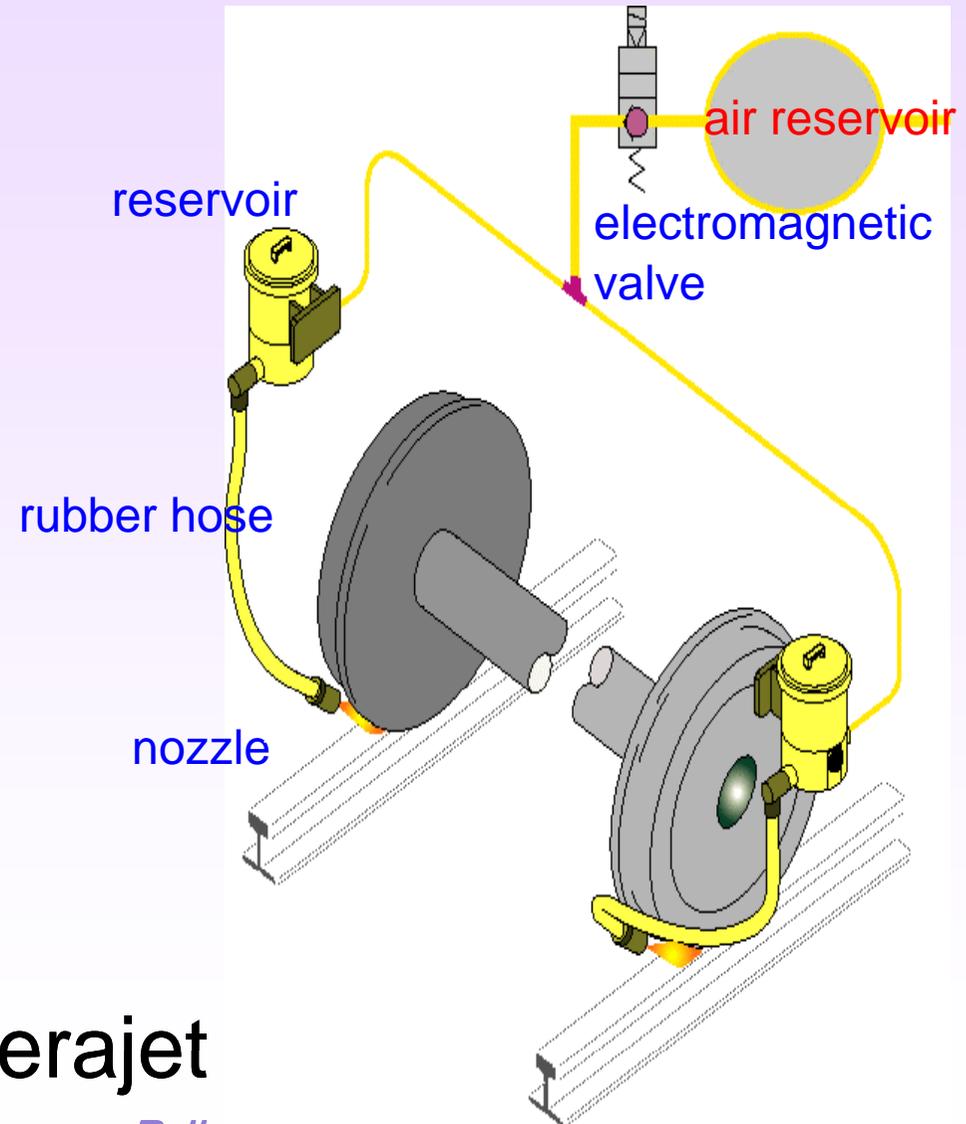
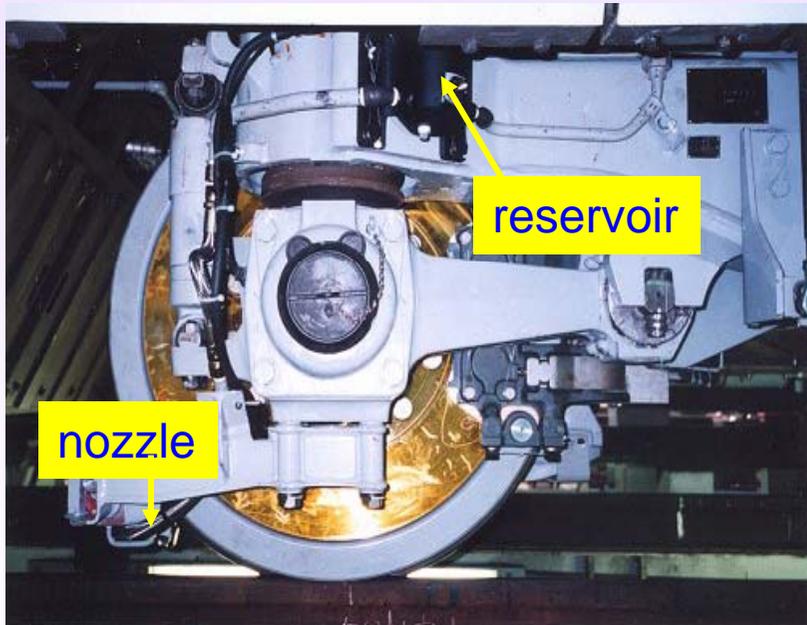
Rail wheel

Adhesion test unit



Cerajet: Improving Wheel/Rail Adhesion

preventing slip and skid



RTRI Japan

Cerajet



Railway Technical Research Institute

Frictional Materials

