Development of The Gauge Change Train System in Japan

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1. The present state of Japanese railway

Railway Network in Japan

The present state of the passengers

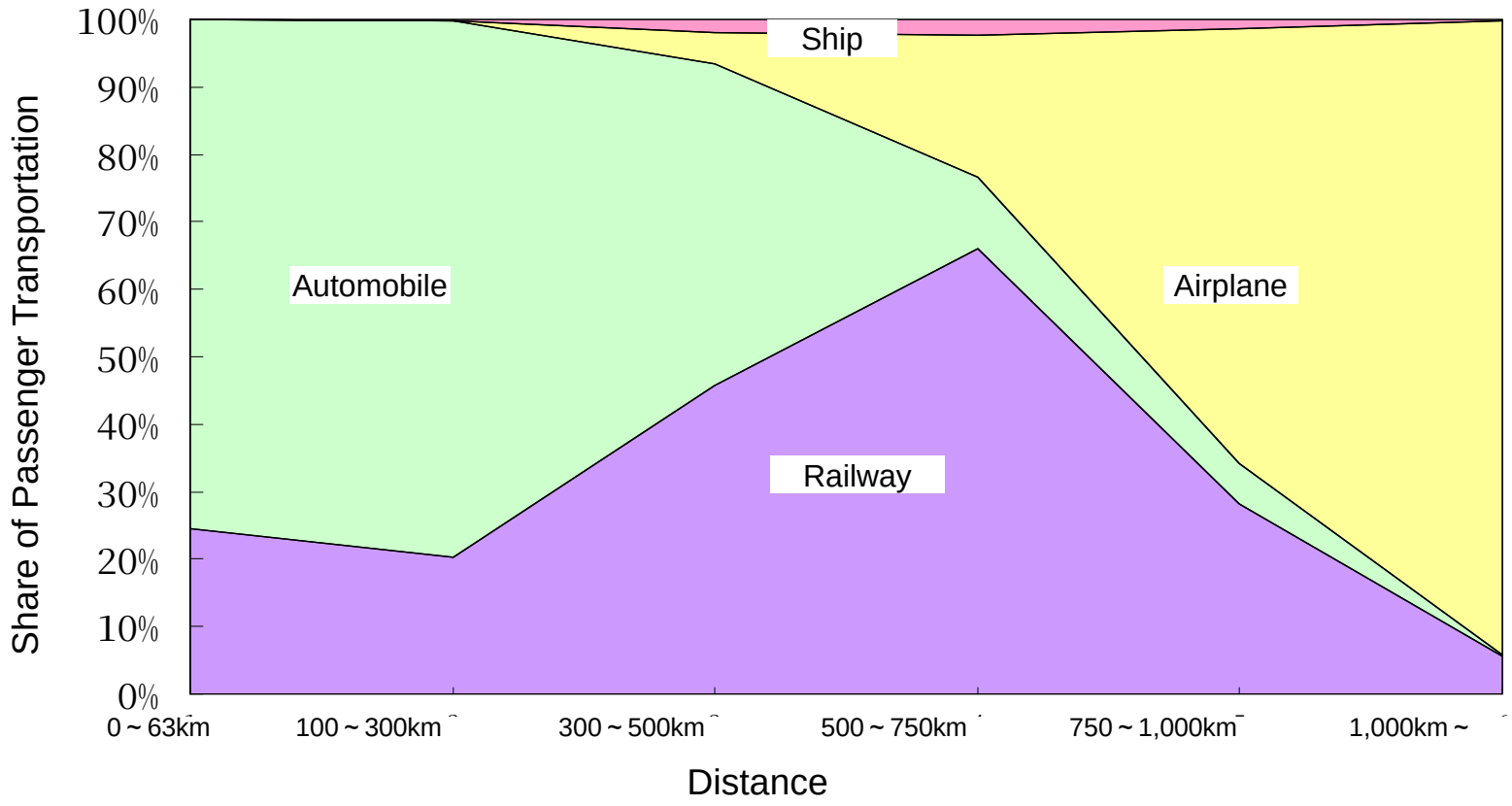
Number of Passengers and Passenger kilometer (2005)

	JR Conventional Lines	Shinkansen Lines
Number of Passengers	about 8,400 (Millions of People)	about 300 (Millions of People)
Passenger kilometer	about 170 (Billions of Passenger kilometer)	about 80 (Billions of Passenger kilometer)

(Fiscal year)

(Source: Ministry of Land Infrastructure, Transport and Tourism)

The Share of Passenger Transportation Modes According to Distances



(Source: Ministry of Land Infrastructure, Transport and Tourism)

2. The plan of Shinkansen network

Birth of the Shinkansen

Background

Economy

- High economic growth in 1950s
→Increased movement of people and goods
- Decision to hold Tokyo Olympics in 1964

Railway

- Transportation demand increase Tokaido Line b/w Tokyo and Osaka
- Necessity of High speed mass transportation

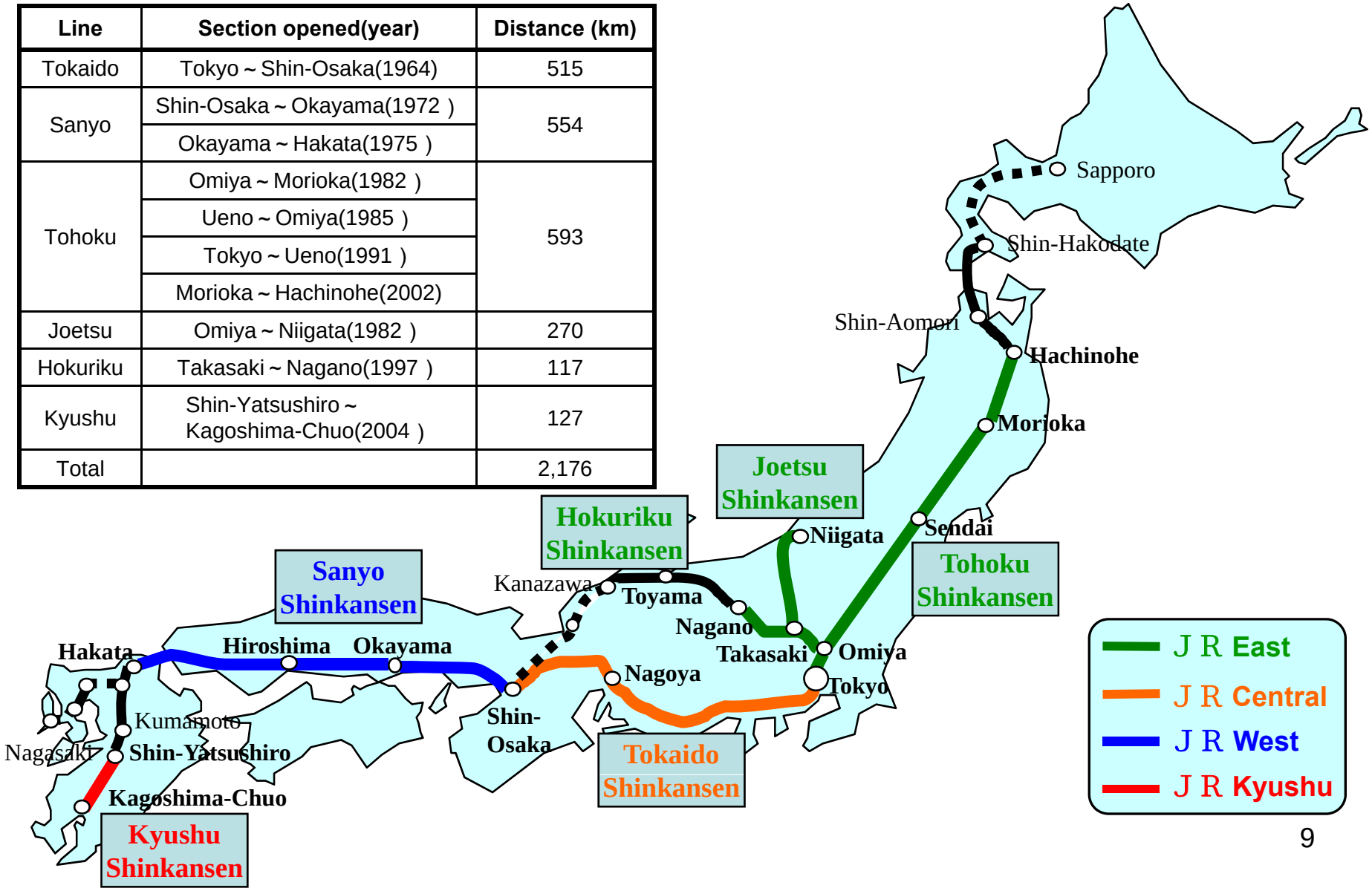
Process

1958 Decision to construct Tokaido Shinkansen

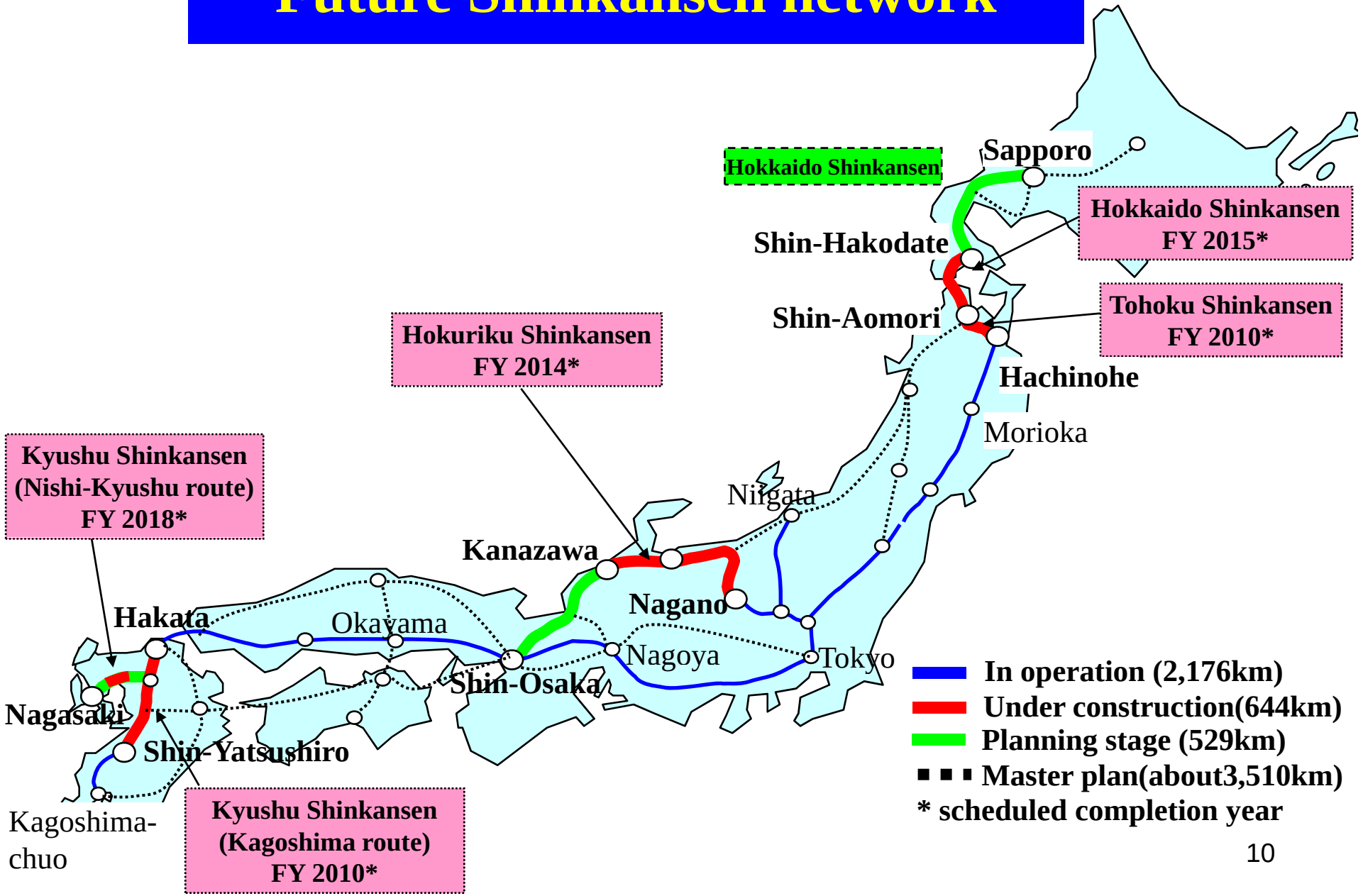
1964 Opening of Tokaido Shinkansen

Shinkansen Network

Line	Section opened(year)	Distance (km)
Tokaido	Tokyo ~ Shin-Osaka(1964)	515
Sanyo	Shin-Osaka ~ Okayama(1972)	554
	Okayama ~ Hakata(1975)	
Tohoku	Omiya ~ Morioka(1982)	593
	Ueno ~ Omiya(1985)	
	Tokyo ~ Ueno(1991)	
	Morioka ~ Hachinohe(2002)	
Joetsu	Omiya ~ Niigata(1982)	270
Hokuriku	Takasaki ~ Nagano(1997)	117
Kyushu	Shin-Yatsushiro ~ Kagoshima-Chuo(2004)	127
Total		2,176



Future Shinkansen network



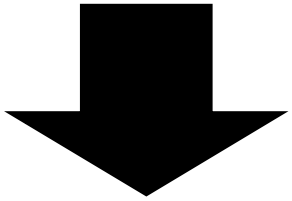
3. The concept of the Gauge Change Train in Japan

A 1994 report by the Council for Transport Technology

"What technology development in railways should be with the 21st century in perspective"

It is important to develop a gauge change train that can accommodate both standard and narrow gauge tracks.This would eliminate the need for passengers to change trains between the two types of gauge and improve the convenience of railway network

: Success21Plan

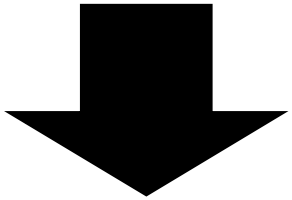


Starts a basic research
(Railway Technical Research Institute)

December, 1996 Government and the ruling parties agreement

- About the handling of bullet train projects -

“Technological development etc. of a gauge changing train to benefit the effect of speed-up of the Shinkansen railway to other regions” is promoted.



The subsidy from the national government has been summed up since 1997 fiscal year.

Development scheme in gauge change train

JRTT is promoting this project under the direction of the MLIT.
Technology Research Association of Gauge Change Train is in charge of the development of technology

MLIT

•MLIT:The Ministry of Land, Infrastructure, Transport and Tourism Government of Japan

direction

JRTT

*JRTT: The Japan Railway Construction, Transport and Technology Agency

consignment

Technology Research Association of Gauge Changing Train

○ member

・Kawasaki Heavy Industries , Ltd
・Kyushu Railway Company
・Shikoku Railway Company
・Sumitomo Metal Industries , Ltd.
・Tetsudo Kiki Kaisha, Ltd
・Railway Technical Research Institute
・Toshiba corporation
・Totetsu Kogyo co.Ltd
・Nabtesco Corporation
・West Japan Railway Company
・Nippon syaryo ,Ltd
・Hitachi .Ltd

4. The development of the Gauge Change Train System in Japan

Technical development of Gauge Change Train

Development and test run of The 1st trial EMU train

October,1998 : the 1st trial EMU train is completed.
April,1999 - January, 2001 : Test run etc. at high speed are executed in the United States Pueblo railway examination line.
October, 2001 : Test run etc. are executed in domestic narrow gauge.
Between August and October, 2004 : Test run is executed with domestic standard gauge.

Test run in Pueblo

Test run in domestic narrow gauge truck.

Test run in domestic standard gauge truck

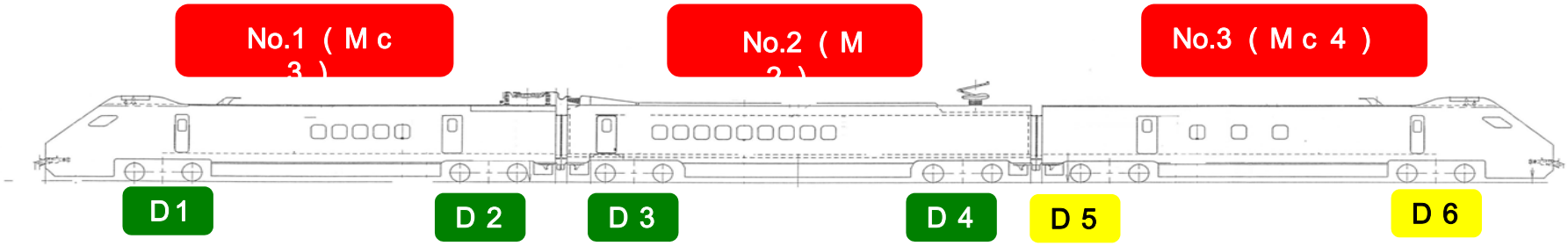
The driving performance at 130 km/h is confirmed in the narrow gauge trucks.
The driving performance at about 200 km/h is confirmed in the standard gauge trucks.

Development and test run of new model

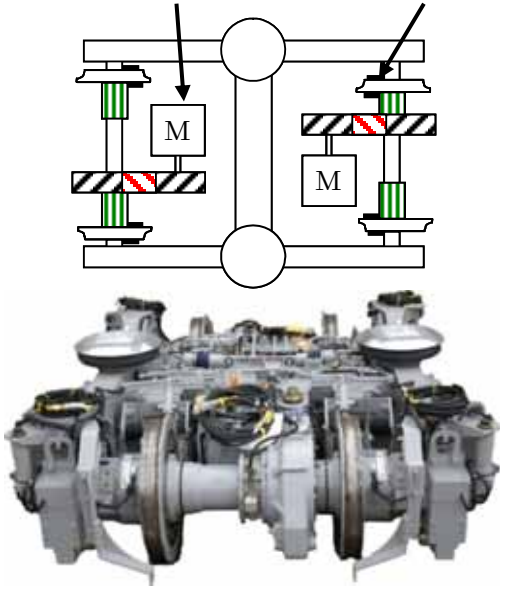
2005 fiscal year : The train production of The 2nd trial EMU train
March,2007 : New completion of the train and test run in the factory, etc. are executed
December,2007 : Test run in domestic narrow gauge truck is begun.
Between June and December, 2008 : The execution of the improvement of the new train set.
January, 2009 : Test run in domestic narrow gauge is begun.

New train in test run

The 2nd Trial Gauge Change Train Set

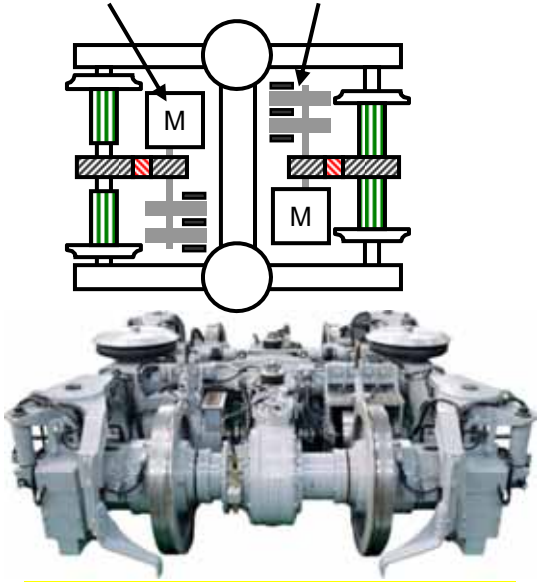


Traction motor
Wheel-mount disk break



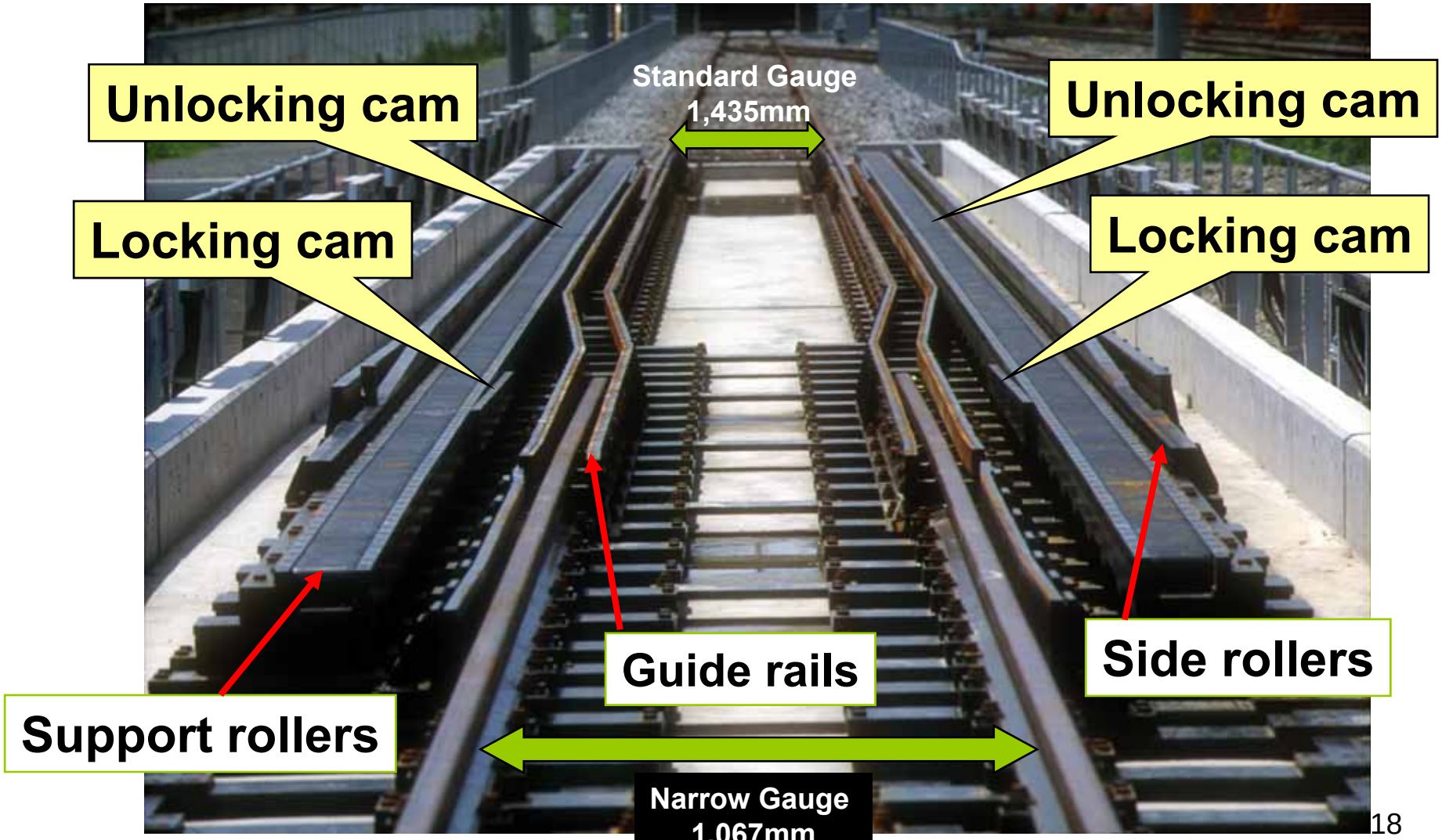
Offset gear style : GDT1
Wheel-mount Disc Brake

Traction motor
Bogie mount break

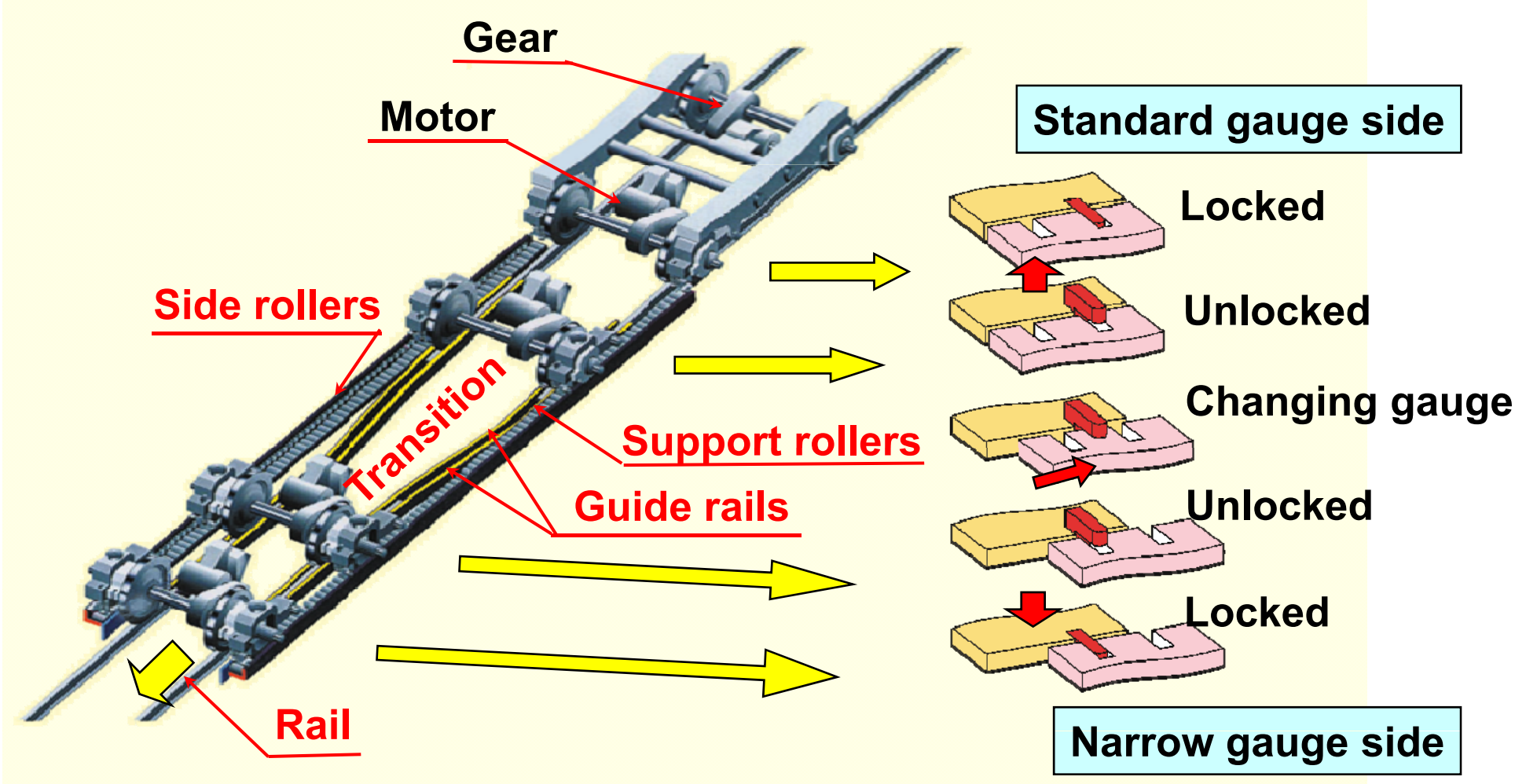


Center gear style : GDT2
Bogie-mount Brake

Gauge Change Equipment



Gauge Change Mechanism



The 2nd Trial Gauge Change Train is under Test Running

Gauge Changing Test in Shin Shimonoseki
(May 2009)

<Next Schedule>
High-speed Running Test on Kyushu-Shinkansen Line
(July-December 2009)


Thank you for your attention