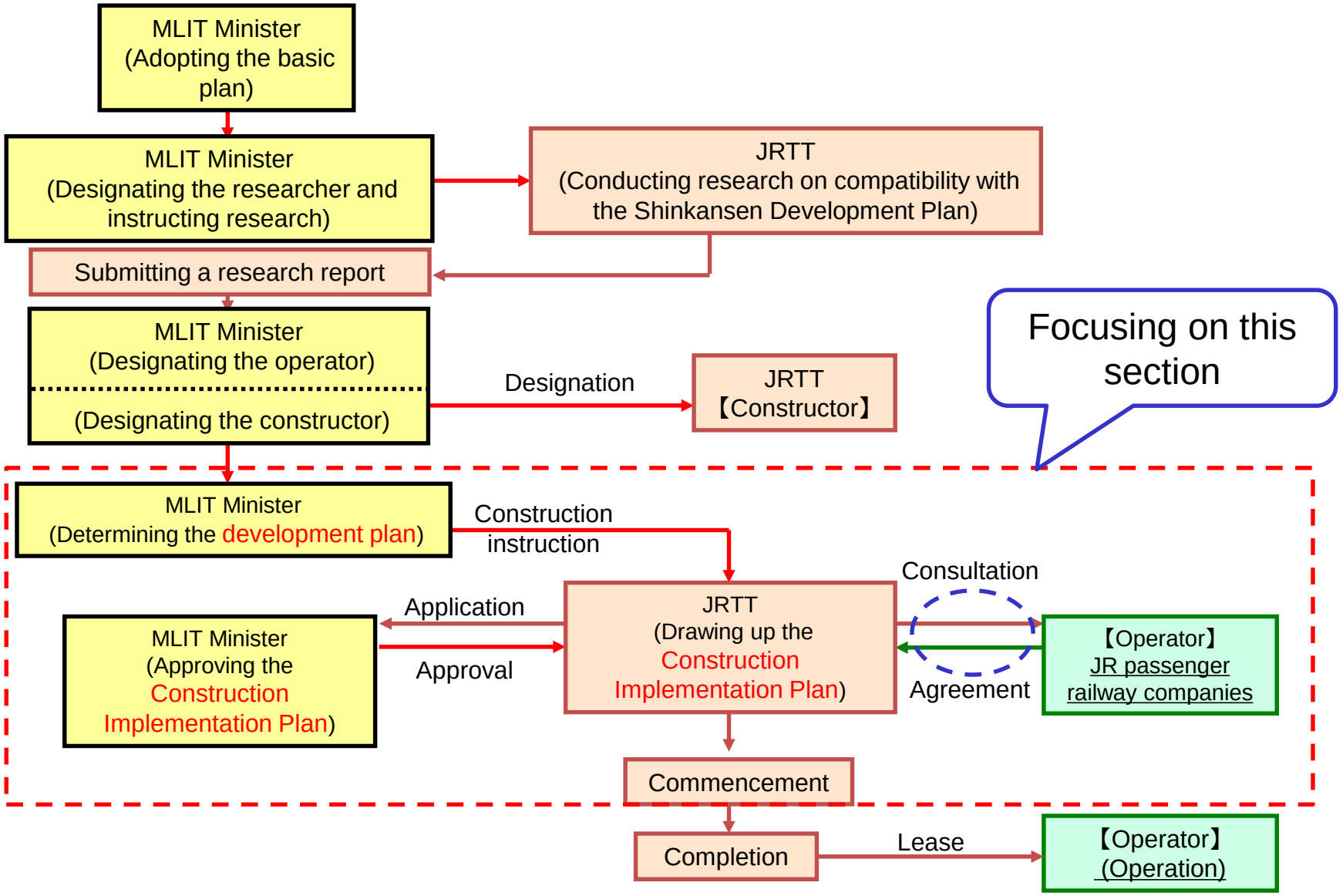
Projected Shinkansen Workflow from Planning to Service Launch

*These slides were created and provided to IHRA by
Japan Railway Construction, Transport and Technology Agency (JRTT)

Projected Shinkansen workflow from planning to construction



Consulting with the operator from the stage of drawing up the Construction Implementation Plan to construction completion in view of future railway operations and maintenance

Projected Shinkansen construction planning

Shinkansen Development Plan

MLIT Minister determining a development plan and instructing construction to JRTT

1. Construction line
2. Section
3. Operation method
4. Maximum design speed
5. Approximate cost
6. Others (main en-route locations)

Construction Implementation Plan

Drawn up by JRTT and submitted to the MLIT Minister for approval

1. Route name
2. Construction section
3. Track locations
4. Total track length
5. Station locations
6. Locations of depots and inspection / repair facilities
7. Construction method
   a. Minimum curve radius
   b. Steepest gradient
   c. Center-to-center track spacing
   ...
8. Construction budget
9. Scheduled construction commencement and completion

JRTT consults the operator in drawing up the Construction Implementation Plan

Coordination between JRTT and operator

- From the planning stage to construction, JRTT and JR, which is the future operator, set up an “implementation council” to continuously consult each other on the matters listed below.
- Backtracking on the construction stage can be avoided by compiling the Construction Implementation Plan in consultation with the operator in view of future operation and maintenance.

Timing	Examples of matters for consultation
Before construction commencement	• Route name • Construction section • Detailed track locations • Total track length • Detailed station locations
After construction commencement	• Vertical and plane alignment • Types of structures (if requiring changes) • Positions of maintenance facilities such as maintenance staircases • Use of special structures • Height of noise barriers based on surrounding environment • Countermeasures for snow damage

Structure of the Implementation Council and its sub groups

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Shinkansen Railway Liaison Council

High-level deliberations on the basic construction policy

Shinkansen Railway Construction Implementation Council

Detailed deliberations on the following based on the basic policy

- **Civil Engineering Facilities Sub-Group**
  Station Facilities Sub-Group
  - Construction Implementation Plan, etc.
- **Snow-Damage Countermeasures Sub-Group**
  - Snow removal method, snow-damage control facilities, turnout malfunction countermeasures, snow removal on rolling stock depots, wiring at rolling stock depots, etc.
- **Track Facilities Sub-Group**
  - Construction Implementation Plan, track facilities, development of necessary technologies, etc.
- **Electrical Facilities Sub-Group**
  - Electrical facilities, design approach, development of necessary technologies, etc.

Specific consultation example

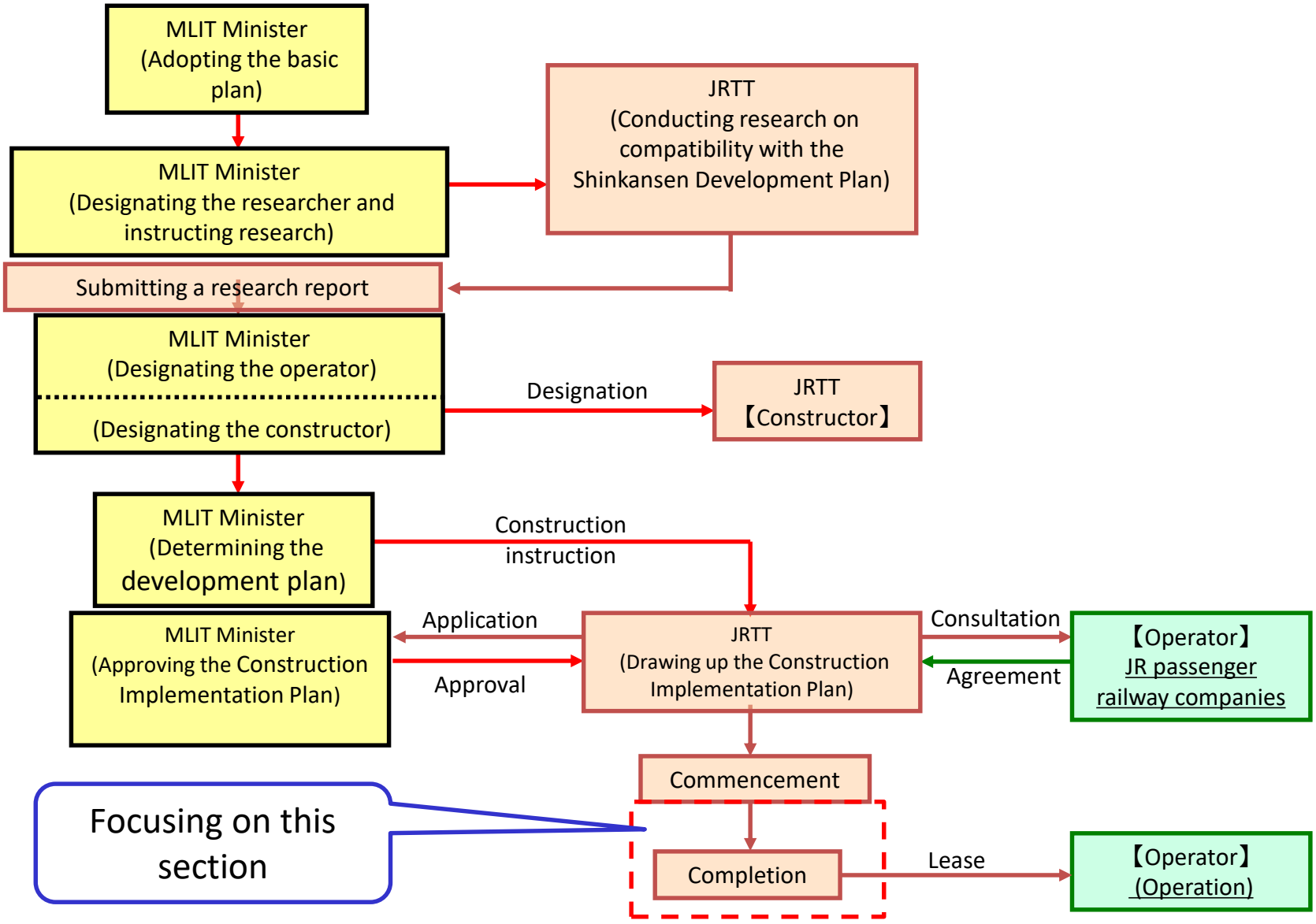
Maintenance facilities installation plan

- Maintenance ramps: required to bring in road-rail vehicles and transporting materials for facility maintenance.
- Maintenance staircase: for those who carry out maintenance and inspection work.
- From the design stage, JRTT and the operator consulted each other on the installation of maintenance facilities based on the maintenance plan.

One ramp in every 5-7km as a guide (in the case of Hokuriku Shinkansen between Kanazawa and Turuga)

One staircase in every 1.5-3km as a guide (in the case of Hokuriku Shinkansen between Kanazawa and Tsuruga)

Projected Shinkansen workflow from planning to construction



JRTT's roles in Shinkansen construction

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JRTT

Providing control guidance and supervision for the project as a whole

- Drawing up an overall construction plan
- Briefing local communities
- Land and geological surveys
- Consulting with local governments, etc.
- Designing structures
- Acquiring lands
- Engaging contractors
- Supervising construction
- Examining completion

Private enterprises

Handling individual tasks under JRTT's guidance and supervision

Service agreement

- Land / geological survey companies
- Design consultant
- Civil engineering work
- Track construction
- Electrical work
- Mechanical work

→ General contractor

→ Specialized companies

Lease

Service launch (operator)

Consultation and coordination within JRTT in the construction stage

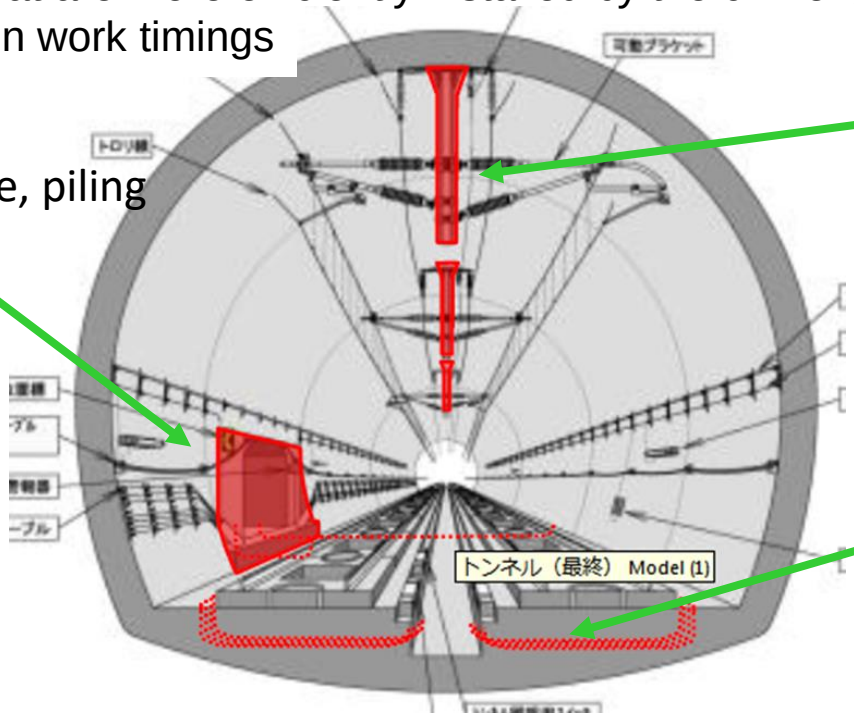
- Railway operation represents general technology that consists of individual technologies.
- For this reason, in the construction stage, JRTT must not only consult the operator but also engage in consultation / coordination with departments within JRTT in proceeding with the project.

Category	Tasks in charge
Siting	Acquiring land, offering compensation, etc.
Civil engineering	Building civil engineering structures, etc.
Tracks	Laying railway tracks, etc.
Mechanical	Installing rolling stock inspection / repair equipment, elevators, etc.
Architectural	Building station buildings, electrical buildings, etc.
Electrical	Installing cables for receiving, feeding and distributing electricity, contact lines, etc.

Example of inter-functional consultation / coordination within JRTT

Coordination between the civil engineering and electrical teams

- When installing electrical facilities, the electrical team must prepare the foundation for electrical equipment and underground conduit for passing through electrical cables in advance.
- For facilities that have the following characteristics, the electrical team must assign the civil engineering team to carry them out. This is called “civil engineering commissioning.”
  - Facilities that are more efficiently installed together with structures by the civil engineering team
  - Facilities that could damage structures if installed by the electrical team
  - Facilities that are more efficiently installed by the civil engineering team due to difference in work timings



Example of consultation / coordination between JRTT and operator

- JRTT and the operator also consult each other to determine the position and scale of train crew offices / maintenance yards as well as the scale and specifications of employee training facilities when the operator reaches the stage of considering specific structure and method of maintenance administration.

Shinkansen maintenance yard

Shinkansen crew office

Audit and inspection before service launch

- Various organizations carry out the following audit / inspection to confirm that all railway facilities meet their required performance and specifications.
- The project schedule must be drawn up and managed in view of not only the construction period but also the timeframe for these inspections, which require a period of over one year in total.

	Inspector	Description
Construction completion audit	JRTT (constructor)	Carried out by JRTT's head office on the applicable regional branch where the construction has taken place according to the Construction Completion Audit Regulations
Facility inspection	JR (operator)	Carried out in cooperation with JRTT to examine the applicable facilities' finish, conditions and compliance with various standards
Completion inspection	MLIT	Carried out on the railway operator (JR) according to the Railway Business Act

Audit and inspection before service launch