RESEARCH AND INNOVATION TO ACHIEVE INTELLIGENT, INTEGRATED, AND SUSTAINABLE TRANSPORTATION
Background and Urgency

17 SUSTAINABLE DEVELOPMENT GOALS
Background and Urgency

Sustainable Transportation Development Concept

01 | Avoid
02 | Shift
03 | Improve
Sustainable Transportation Development Concept

01 | Avoid

Avoid the usage private vehicle and inefficient logistics system

- Transportation system planning with The Concept of Mixed Use
- Development of Transit Oriented Development (TOD) Infrastructure

Benefit

Reducing travel time, improving air quality, health, safety, etc.

Source: sustainabledevelopment.un.org
Sustainable Transportation Development Concept

02 | Shift

+ To shift private vehicle user to environment friendly public transport
  - Construction of Mass Public Transport for Passenger and Railway Network for Logistic Transport
  - Increase the use of public transport, number of pedestrian and cyclist

+ Benefit

Reduce road congestion, distribution of activity, reduce pollution and enhance safety

Source: sfmta.com
Increase the utilisation of ICT for transportation

- Technology utilisation
- Development of Intelligent Transportation Systems (ITS)

Benefit
Increase the usage of renewable energy, productivity affordability and accessibility
Low Carbon Emission

Fuel Efficient Mode:
- Train
- Ship
- Airplane
- Car

Renewable Energy:
- Electric Energy
- Biofuel
To Achieve:

- Traffic efficiency
- Enriches users with prior information about traffic
- Reduces travel time
- Enhances safety and comfort.
Research and Innovation
(Flagship Program 2020-2024)
Railway Transportation

TARGET:

1. High Speed Train 250 km/hr prototype,
2. 80% Local Component for Urban Train
Maritime: Harbour Tug Dual Fuel Boat

Target: Tug Boat Prototype for Pelindo 3 Port Service

- Traction and control system for tugboat winches: BPPT, PINDAD, BKI
- Ship design & certification: BPPT, ITS, Kemenhub, PAL, BKI
- Piping and General System: BPPT, PAL, BKI
- Sea Trial and Bollard Pull Test: BPPT, PT. LEN, PT. INTI
- Safety and Fire System: BPPT, Kemenhub, PT. BKI
- Production Technology: BPPT, PAL
- Material (Marine Grade): Structural Testing
  BPPT, BKI, PT. KS
- Navigation and Communication System
  BPPT, PT. LEN, PT. INTI
- Electrical System and Automation
  BPPT, PAL, BKI, PT. LEN
- Hydrodynamics Testing and Analysis
  BPPT, BKI
- Engine and Propulsion System Design
  BPPT, PAL, BKI
- Maneuvering and Stability Analysis
  BPPT, BKI
- Structure Analysis and Design Construction
  BPPT, ITS, BKI
Aeroplane - N219A

- Aircraft Improving Performance, Reduce Weight, Stability (LAPAN, PTDI, BPPT)
- Flight Test Development (LAPAN, PTDI, BPPT)
- Aircraft Reinforcement in Attachment (LAPAN, PTDI)
- Aircraft structural Test & Prototyping (LAPAN, BPPT, PTDI)
- Hydrodynamics Test & Analysis (BPPT, LAPAN, PTDI)
- Flight Simulator Development (LAPAN, PTDI)
- Composite and Material for Structure Float Gear (LAPAN, BPPT, PTDI)
- Regulation and Certification Development (KEMENHUB, BPPT, LAPAN, PTDI)
- Aerodynamics Test & Analysis (BPPT, LAPAN, PTDI)
- Seaplane Dock Development (KEMENHUB, PUPR, BPPT)
Transportation Innovation

Products
**Main Characteristics**

- **Construction Cost** 80 T
- **Increase of Local Components**
- **Travel Time Jakarta-Surabaya** 5.5 hour
- **Ballastless track & without level crossing**
- **Signalling System ETCS level 1**
- **Diesel Electric Multiple Unit**

**Wind Tunnel Test Mask of Car** – B2TA3 –

**Soil Reinforcement for Railway Structure at Beach** - BTIPDP -

**Test Track Utk Validasi Performa Dinamik**

- **Durability & Reliability**
  - loop test track
- **Safety, stability & comfort**
  - small curve & elevation
- **Noise level**

**Technology Clearing: Medium Speed Train Jakarta-Surabaya**
Technology Audit for Jabodebek LRT

Structural Test of LRT - Jabodebek Bogie
- B2TKS -

Bogie Full Scale Dynamic Test
- Target 2022 -

Validation Test of LRT Jabodebek
- TIRBR 2019 -

Current

Target: 80% Local Component

Product

<table>
<thead>
<tr>
<th>Product</th>
<th>Estimated Proportion of Cost of Materials</th>
</tr>
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<tbody>
<tr>
<td>Sistem Propulsi dan Traksi</td>
<td>27%</td>
</tr>
<tr>
<td>Carbody Materials (Aluminium)</td>
<td>9%</td>
</tr>
<tr>
<td>Electrical Controls</td>
<td></td>
</tr>
<tr>
<td>Fabricated Steel Body Component</td>
<td></td>
</tr>
<tr>
<td>Fiberglass</td>
<td></td>
</tr>
<tr>
<td>Air Conditioning</td>
<td></td>
</tr>
<tr>
<td>Wheels, Axle and Bogie</td>
<td>2%</td>
</tr>
<tr>
<td>Pipe works &amp; Ducts</td>
<td>3%</td>
</tr>
<tr>
<td>Seats : Passenger &amp; Driver</td>
<td>3%</td>
</tr>
<tr>
<td>Sheet, structural</td>
<td></td>
</tr>
<tr>
<td>Brakes</td>
<td>3%</td>
</tr>
<tr>
<td>Windows</td>
<td></td>
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</tbody>
</table>

Sumber: Research strategic Connection group, estimates based on the production of electric train, Australia
To enhance safety at Level Crossing between railway and road, and ensure the safety of both road user and train passanger.

i-SLC is a safety enhancement system at the crossing between railway and road, that use sensor to automatically detect train.
Automatic Dependent Surveillance Broadcasting

ADS-B is a surveillance system that can be integrated with other surveillance technologies or also can be operated as independent information sources for surveillance monitoring.

**Benefit:**
- Airplane Crash Avoidance
- Enhancement and optimisation of sky space on the airport