1. Outline of Urban Railway
2. Financial Scheme of Urban Railway
3. Main Urban Railway
   (1) Heavy Railway
   (2) Linimo (Electromagnetic suspension Linear Induction Motor Propulsion)
   (3) LRT (Light Rail Transit)
4. Improving Customer's Convenience

Various modes of urban transportation

- Urban train cars
  - Subway
  - JR
  - Electromagnetic suspension Linear Induction Motor Propulsion
  - Light Rail Transit
  - Monorail
  - People mover, Automated Guideway Transit
### Various modes of urban transportation

<table>
<thead>
<tr>
<th>Transport Capacity (thousand people per hour)</th>
<th>Average Speed (km/h)</th>
<th>Interval between stations (m)</th>
<th>Total Cost (billion yen/km)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heavy Rail</strong></td>
<td>Large 40~50</td>
<td>25~30</td>
<td>700~1,200</td>
</tr>
<tr>
<td><strong>Subway</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Linimo (New Transportation System)</strong></td>
<td>Medium 10~20</td>
<td>15~30</td>
<td>700~1,200</td>
</tr>
<tr>
<td><strong>BRT (Bus Rapid Transit)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LRT (Light Rail Transit)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bus</strong></td>
<td>Small ~3</td>
<td>10~15</td>
<td>300~500</td>
</tr>
</tbody>
</table>

1. Outline of Urban Railway
2. Financial Scheme of Urban Railway
3. Main Urban Railway
   (1) Heavy Railway
   (2) Linimo (Electromagnetic suspension Linear Induction Motor Propulsion)
   (3) LRT (Light Rail Transit)
4. Improving Customer's Convenience
Tokyu Den-en-toshi Line
- Length: 19.6 miles (31.5 km)
- Time: 0h34m
- Max. Speed: 68 mph (110 km/h)

Before Opening (in 1960s)

After Opening (in 2005)

(TAMAPLAZA-TERRACE: http://www.tamaplaza-terrace.com/)

The Increase of the population along the Tokyu Den-en-toshi Line

Area Resident Population (in 2000): 520,000
Tsukuba Express
Opening: August 2005
Length: 36.2 miles (58.3 km)
Time: 0h45m
Max. Speed: 81 mph (130 km/h)

Decide the land usage during the planning phase

The "City-planning committee", organized by both public & private, is established to develop the integrated city plan.

1. Outline of Urban Railway
2. Financial Scheme of Urban Railway
3. Main Urban Railway
   (1) Heavy Railway
   (2) Linimo (Electromagnetic suspension Linear Induction Motor Propulsion)
   (3) LRT (Light Rail Transit)
4. Improving Customer's Convenience
**Linimo (Electromagnetic suspension Linear Induction Motor Propulsion)**

- **Opening:** March 2005
- **Length:** Approx. 5.5 miles (Approx. 8.9km) 
  (Fujigaoka ~ Yakusa)
- **Time:** Approx. 17 minutes
- **Max Speed:** 62mph (100km/h)
- **Technology:** Electromagnetic suspension
  Linear Induction Motor Propulsion

---

1. **Outline of Urban Railway**
2. **Financial Scheme of Urban Railway**
3. **Main Urban Railway**
   (1) Heavy Railway
   (2) Linimo (Electromagnetic suspension Linear Induction Motor Propulsion)
   (3) LRT (Light Rail Transit)
4. **Improving Customer's Convenience**
**Toyama Light Rail**

- **Opening**: April 2006 (Taking over JR Line)
- **Length**: Approx. 4.7 miles (Approx. 7.6km)
- **Max Speed**: Approx. 37mph (Approx. 60km/h)

**Improvement of LRT System Facility**
- LRV
- Less Vibration Rail
- IC Card System
- Improvement of Electric & Signaling System
- New Station

**Compensation for continuous grade separation (3 places)**

---

1. Outline of Urban Railway
2. Financial Scheme of Urban Railway
3. Main Urban Railway
   - (1) Heavy Railway
   - (2) Linimo (Electromagnetic suspension Linear Induction Motor Propulsion)
   - (3) LRT (Light Rail Transit)
4. Improving Customer's Convenience
Example with JR station and LRT Railcar stop
Location: Hiroshima city
Station: Yokogawa Station (JR Sanyo Main Line)
        Yokogawa Railcar Stop (Hiroden Main Line)
Opening: March 27th 2003

The Hiroden Yokogawa Railcar stop was relocated inside the station square and improved. In addition, the JR Yokogawa St. ticket gate was relocated to improve traffic connection between the two stations and allow passengers to transfer more easily from one train to another.

Through-service

The First through-service in Tokyo was launched on Hibiya Line in 1964 (Tokyo Olympic Year).

Expansion of through-service network in Tokyo Metropolitan Area
Through-service has been spreading over years in Tokyo Metropolitan Area with its network now covering almost the entire area.

**Expansion of through-service network in Tokyo Metropolitan Area**

- Hibiya Line (Tokyo Metro)
- Ikebukuro Line (Toqu)
- Sotobori Line (Tokyo Metro)
- Shinjuku Line (Tokyo Metro)
- Yamanote Line (JR)
- Minatomirai Line (Yokohama Metropolitan Railway)
- Keio Line (Keio)
- Keisei Line (Keisei)
- Tojo Line (Toqu)

**Through-service network length**

- 1970: 155 km
- 2009: 869 km

Thank you for your kind attention.