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27PM3 Urban Challenges for Smart Cities  
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# Smart Sharing City

-A New Challenge for Post-Motorized Society-

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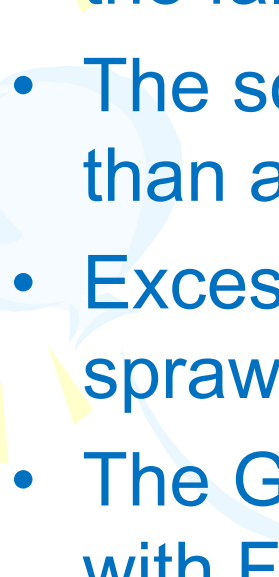

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# The Japan Syndrome

(As per The Economist, Nov. 18<sup>th</sup> 2010 )

- Japanese population started to decline due to the falling birth rate
  - The society is growing older at a faster pace than anywhere else
  - Excessive auto-dependency accelerated urban sprawl and decline of city centers
  - The Great East Japan Earthquake and Tsunami, with Fukushima Nuclear Power Plant accident aggravated the situation
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# We need to develop a new approach

The solution:

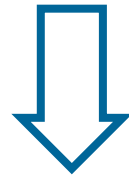
## Smart Sharing City

- Promotion of Public Transport
- Bicycles
- The Compact City
- Use of ICT (Information and Communication Technology)

The key concepts common to all four areas are sharing and sustainability

# Examples

- Compact city shares spaces
- Public transport shares travel time
- Bike sharing



- Energy reduction
- Health promotion
- Environmental friendliness

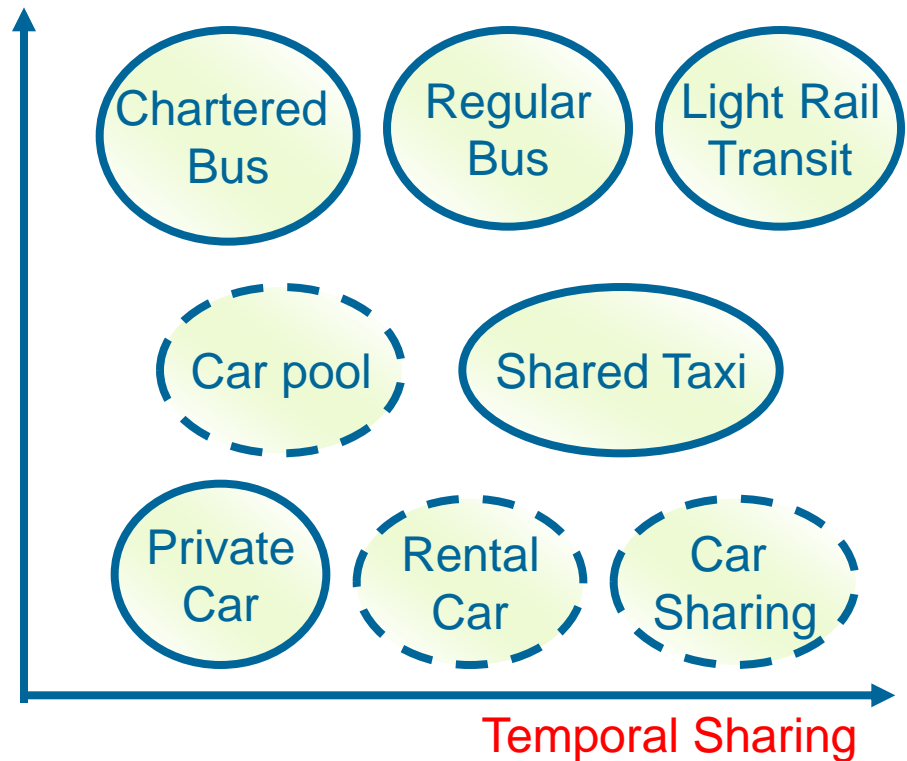
# Shared Mobility

How to share space and/or time in transportation?

- **Spatial Sharing**: A vehicle is used by many people in the same time period

- **Temporal Sharing**: Many people use the same vehicle in different time period

Spatial Sharing



# Sharing of Cars

- Car Lease: **Long-term Lease Contract** for specific customer
- Rent-a-Car: **Hourly or Daily Lease** to unspecific general public
- Car Sharing: **Short-term Lease** to preregistered members
- Uber: Sharing of mobile ride service by private drivers



→ Yearly



→ Half a day to a few days



→ Up to several hours



→ Short ride driven by peers



# Sharing of Space

Public Transport (Bus)



Bicycles



Automobile



The Canberra Transport Photo – 9 September, 2012  
[www.cyclingpromotion.com.au](http://www.cyclingpromotion.com.au)

# Sharing of Bicycle

Examples are abundant around the world in recent years

- Velib (Paris)
- Barclays (London)
- Citi Bike (N.Y.)
- YouBike (Taipei)



<http://toyosu.tokyo/news/rental-cycle-4area/>

Tokyo started sharing of 1,100 bikes at 110 ports on February 1, 2016



# Sharing Bus Stops

Where to see when you ride a bus?

Multiple bus operators



Need for sharing

- Aggregate Bus Stop Poles
- Aggregate Bus Timetable
- Coordinate bus operation schedule



Utsunomiya University bus stops

# Shared Bus Stop and Timetable



バス発車予定時刻表

2006年04月01日 改正

時刻	平日用 JR宇都宮駅方面 工学部前
5	
6	16 30 31 36 47 51 56
7	02 12 15 19 28 30 30 34 37 39 45 45 47 49
8	00 05 09 15 25 31 34 37 40 42 47 59 59
9	11 15 29 42 44 52
10	01 10 11 14 35 42 47 55 59
11	11 15 17 34 47 57
12	00 11 17 20 30 39 41 59
13	02 11 20 27 39 42
14	11 14 20 27 39 42 47 54
15	01 02 10 11 20 21 39 40
16	00 09 10 11 12 17 22 25 37 39 44 46 55
17	01 05 11 22 22 25 34 37 54 58
18	00 09 14 17 24 25 31 36 45 52
19	12 19 26 31 47
20	02 06 31 56
21	31
22	

統合時刻表の見方

經由地 → 07 → 行先

↑ 発車予定時刻

行先 緑色: 東野バス(JR宇都宮駅西口經由宇都宮東武行き)  
 赤色: JRバス(JR宇都宮駅西口經由作新学院、JRバス車庫行き)  
 青色: 関東バス(JR宇都宮駅東口行き)  
 ※: 海星女子学院津校日蓮休

經由地 東野バス(028-661-2251) JRバス(028-648-0488) 関東バス(028-633-3482)

◆道路事情等により、バスの運行に遅れが生ずることがございますのでご了承ください。



# Sharing of public transport fee

## Low cost group ticket

- Mannheim: Tichet24  
(1 person: €5, 5 persons: €8)
- Freiburg: Regio24  
(1 person: €4.8, 5 persons: €7.2)
- Karlsruhe: 24Karte  
(1 person: €4, 5 persons: €6.5)
- Strasbourg: Forfaits24h  
(1 person: €3.2, 5 persons: €4.3)

# Sharing of Intra and Inter-urban Trams

in Karlsruhe, Germany

Direct connection between Tram and DB since 1992



# Sharing of Housing and Rail Station

Metro Gold Line in Pasadena, California since 2003



# Sharing of public space with LRT

Republic Square Park in Strasbourg, France



# Sharing of Road Space by LRT and Park Houston, Texas since 2004





# Sharing of Road Space by LRT and Park Houston, Texas since 2004







# Sharing Urban Mobility with Future Generation

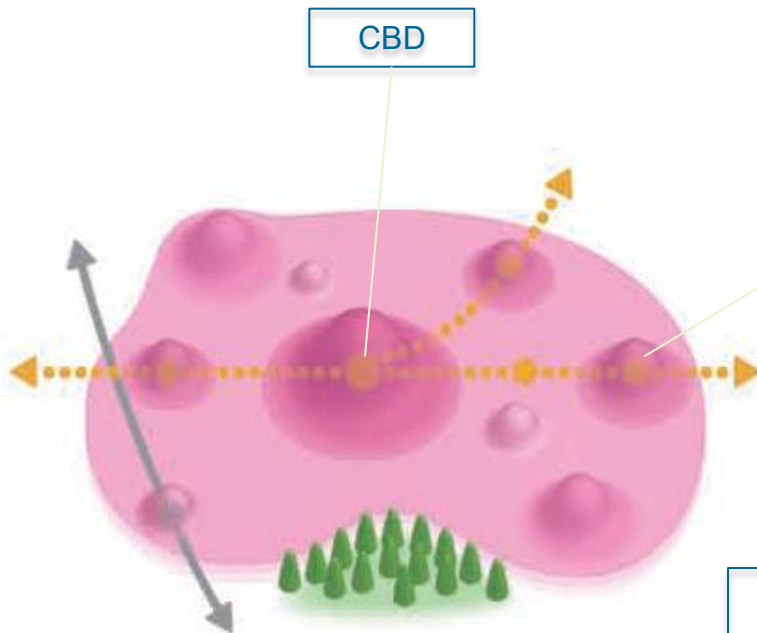
- Transportation infrastructure requires time and money
  - Excessive automobile dependency incurs traffic congestion, accidents, global warming, urban sprawl, etc.
  - Wise investment planning to share the mobility with future generation
  - Smart and sustainable transportation and urban development strategy is vitally important
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# Mobility Strategy of Utsunomiya

## Networked Compact City

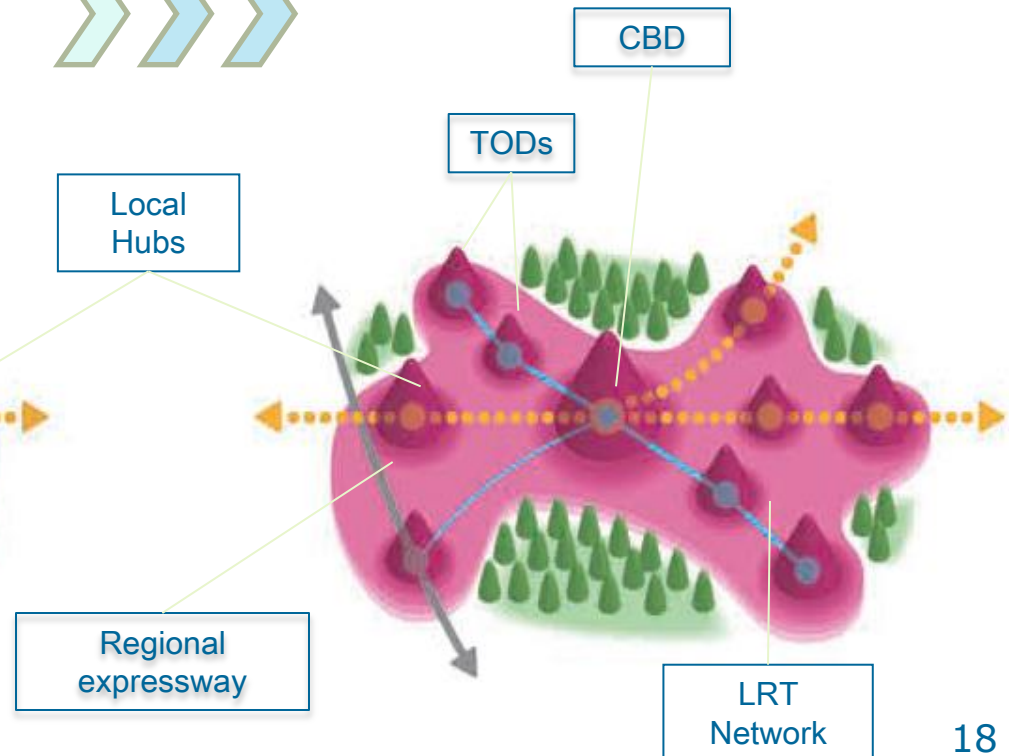
### Present City Image

Low density sprawl with automobile dependency

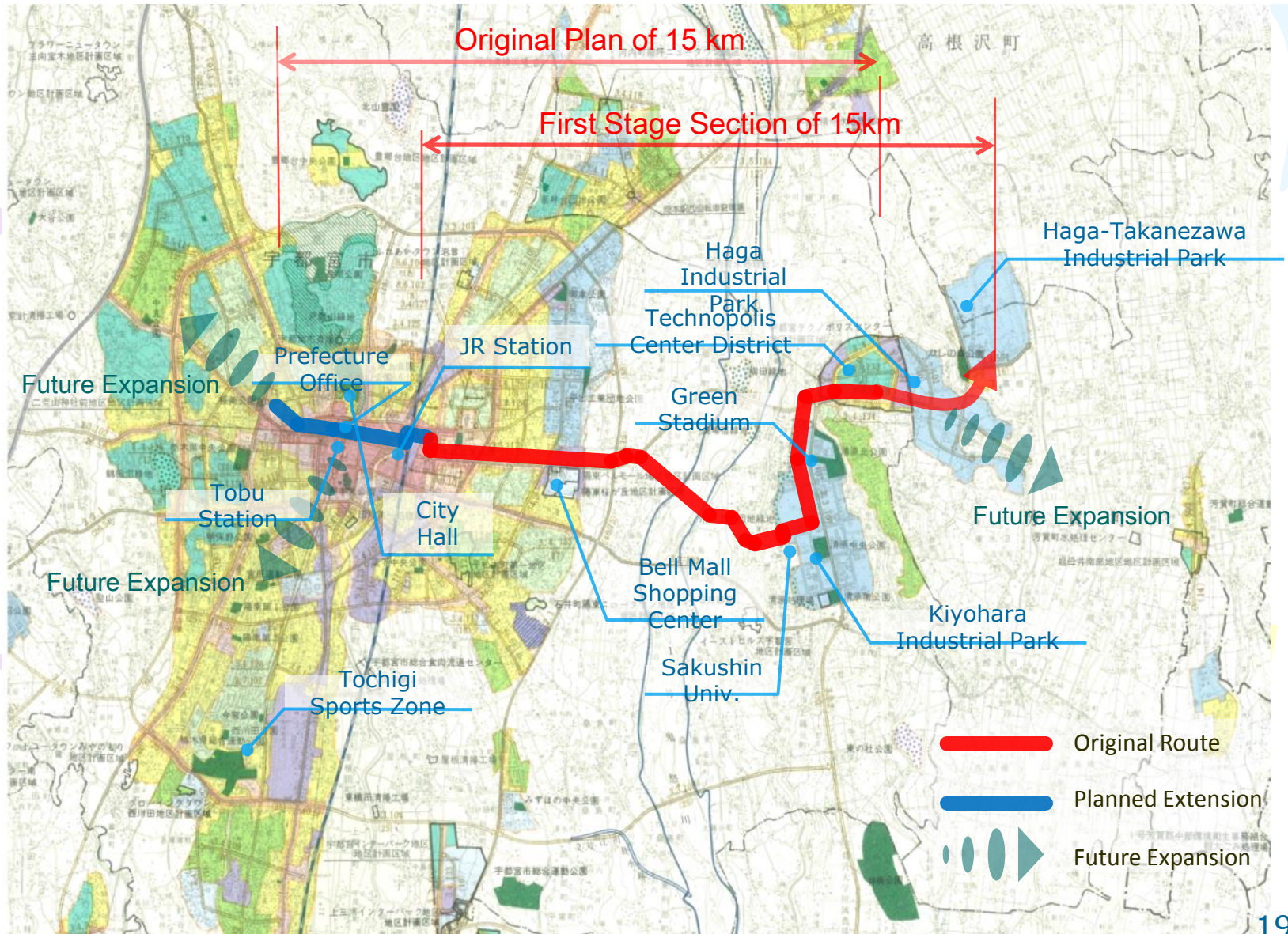


### Future City Image

High density TOD with public transport network



# Planned LRT Route and Future Expansion



# Utsunomiya aims at a Smart Sharing City

- Networked Compact City
- The first new LRT in Japan
- Cycle City Utsunomiya
  - The longest bike lanes
  - Reduction of bicycle accidents by 40% in 5 years
  - Bicycle usage to promote tourism, sport, health and environmental friendliness
  - Planned Shared cycle system

Thank You for your attention !



(It is fun to ride in Utsunomiya)



(It is fun to live in Utsunomiya)