About grasping the mobility of public traffic in local cities and methods of sharing information for behavior change

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1. The City Planning Institute of Japan
   Secretariat of the Urban Structure Evaluation
   Special Committee
2. Fukuyama Consultants Co., Ltd.
Issues in Japanese Cities

Entering into a Population Decrease and Super Ageing Society
Progress of Urban Sponge

Future trend of population

(ALL of JAPAN: millions of people)

- 2006: 127.74
- 2025: 122.54
- 2050: 101.92

Aging rate:
- 2006: 30.0%
- 2025: 37.7%
- 2050: 38.3%

Key events:
- Start of Edo shogunate (1603)
- Kyoho Reforms (1868)
- Meiji restoration
- End of war (1945)
- Industrial Revolution
- World War II

Ministry of Land, Infrastructure and Transport
National Institute of Population and Social Security Research
Grasping Mobility and Share Information

To Protect and Nurture the Diversity of Transportation Methods
Essential to Understand the Current State of Various Stakeholders and to Share Issues

Number of Abolished Section

- in consultation
- persistence
- disuse (have alternative methods)
- disuse (have no alternative methods)

Destination | Last StopA
--- | ---
Vir | Bus StopA
Number | 40
3 | 7
4 | 9
5 | 12
6 | 17
7 | 32
8 | 37
9 | 55
10 | 63
11 | 25
12 | 55
13 | 25
14 | 55
15 | 25
16 | 40
17 | 25
18 | 55
19 | 25
20 | 40
21 | 25
22 | 40
23 | 25
24 | 40
25 | 25
26 | 40

Urban Planning Basic Policy of Fukuoka Prefecture
Grasping Mobility①

OAnalysis Method of Mobility by Regional Situation (Bus Traffic) 
OChange of Traffic Behavior from Person Trip Survey

Time to city center by route buses and bus delay occurrence section

- Bus Delay Occurring Section
- Car: 30.0 minutes
- Bus: 50.0 minutes
- Car: 28.1 minutes
- Bus: 35.0 minutes
- Car: 25.3 minutes
- Bus: 45.0 minutes
- Car: 21.1 minutes
- Bus: 50.0 minutes

fluctuation of delay time (week day) image

- Urban traffic master plan of Kurume city
Grasping Mobility ②

Practicality of Bus Traffic?

Distribution of average driving distance of car

Occurrence concentration (thousand)

Going out less than 5 km by car increases

Regional classification by senior going out behavior characteristics

- Staying home
  - no going out
- Going out by car
- Going out by walk • bicycle • public transport

Urban traffic master plan of Kurume city (3rd–4th Northern Kyushu Person Trip Survey)
Practicality of Bus Traffic?
Percentage: senior population living within 300 m from:

from shopping and medical facilities by area

① high ratio = facilities are near
② low ratio = facilities are distant
③ Areas where facilities become distant as the proportion increases

from bus stops by area

① high ratio = bus stops are near
② low ratio = bus stops are distant
③ Areas where facilities become distant as the proportion increases
How Change Demand for Bus Traffic in Future?

Number of passengers by attribute and section

Ratio of change of population 2005 → 2025 (estimated population)

Number of duplicate route

*Number of passenger by attribute and section*
Factors of Traffic Event Change and Offering Crossing information

Information Offering Method which Everyone Can Use in Various Scenes
Urban Structure Visualization Plan

Sharing Information (Demonstration of this website’s content)

Urban structure visualization plan

- Search by theme
- Search from the area
- Search from source
- Search from scale

Visualize statistical data on the map.

Urban structure visualization plan

2018.02.13: Currently, multiple defects have been reported on the legend display etc., and it is in progress to make corrections. If you have any notes, please contact us from POST at the bottom right of the page.

- **about this website**
  - Here is an overview of this site.

- **Main features of urban structure visualization**
  - This site can visualize statistical data of each field on the map.

- **On the source of posted data**
  - We will introduce the source of publication data utilized on this site.

- **How to use this site**
  - We will show you how to use this site with animation etc.

- **Toward the proper location**
- **Relationship between disaster and urban structure**
- **Visualization of Western population**
- **Please cooperate with the questionnaire**
In order to make it easier to grasp the current state of the city, decided to visualize various data on the map with 3D graph.

This site uses Google Earth to display statistical data. Google Earth is provided free of charge and easy to use, so various people can view statistical data.

This site is released by "Fukuoka Prefecture, the National Institute of Research and Innovation, Building Research Institute, Japan Town Planning Institute Urban Structure Evaluation Special Committee"

Urban Structure Visualization Plan (https://mieruka.city/)
In Society 5.0, people, things, and systems are all connected in cyberspace and optimal results obtained by AI exceeding the capabilities of humans are fed back to physical space. This process brings new value to industry and society in ways not previously possible.
To Smart and sustainable society

• Balance Economic Advancement
  With Resolution Social Problems

Economic advancement
- The demand for energy is increasing
- The demand for foodstuffs is increasing
- Lifespan is becoming longer, and the aging society is advancing
- International competition is becoming increasingly severe
- Concentration of wealth and regional inequality are growing

Resolution of social problems
- Reduction of GHG emissions
- Increased production and reduced loss of foodstuffs
- Mitigation of costs associated with the aging society
- Promotion of sustainable industrialization
- Redistribution of wealth, and correction of regional inequality

Incorporating new technologies such as IoT, robotics, AI, and big data in all industries and social activities, provide goods and services that granularly address manifold latent needs without disparity.

to balance economic advancement with the resolution of social problems

Cabinet Office, Government of Japan
To Smart and sustainable society

Problems
Planning a route is troublesome. I want to avoid traffic jam.
I am concerned about the weather. Safety first.
Want to go to somewhere fun. Want to eat yummy food.

Real time information
Weather, Transportation, Hotels, Restaurants

Big Data
Personal History, AI

Output
Sightseeing area, Transportation, Hotel, Restaurant

Sensor Info.

Burden reduction
Movement Support
Self-driving wheelchairs support movement of elderly citizens

Combination of car sharing services, public transportation, etc.

Reduction of congestion and traffic accidents
Comfortable travel through autonomous driving

Optimal plan
Sightseeing routes matching personal preferences

GHG reduction
Smooth transfer

Cabinet Office, Government of Japan
To Smart and sustainable society

- Maintain society which keep and use Stocks (= manufactured capital)
- Accumulation and sharing of information not only of traffic
- Change in location of work and work style $\rightarrow$ Balance of demand
Regeneration By Data-driven

- **paradigm shift**
  → Forecast of change
  → Influence on urban space

**Utilizing AI**

- Link and Interlocking of Various Factor
  (city planning, administration, citizen, administration and public finance, resource, energy, environment, property, economy, time and so on)

It will be possible to get various ways to approach the future image

**example of effect and new value**

- Hygiene improvement in city and area
- Show in advance places with less anxiety about living
- Expand participation for everyone

- Understanding cities where citizens want to live in
- Understanding where to invest

External factors

Investable budget

Future image of each city, area
Themes We would Like to Discuss

- Methods of sharing information for residents traffic behavior change
- About city and traffic, and trend of management by data