



IMPROVING WALKABILITY AND CYCLING IN THE CITY OF KYOTO

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OUTLINE OF PRESENTATION

Background

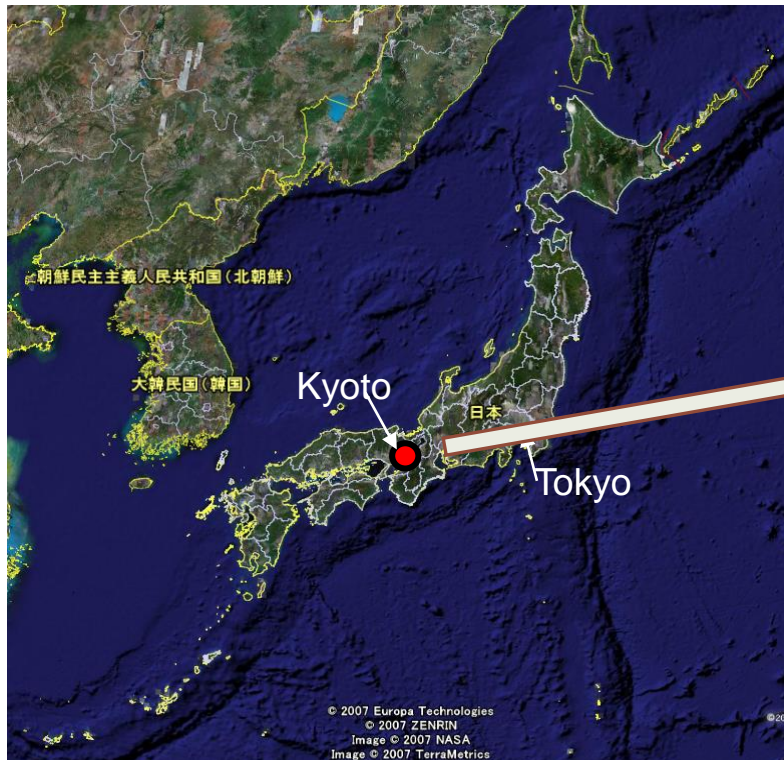
Broadening Shijo-Dori Street Sidewalks

Evaluation of Shijo-Dori Project

Improvement for Cycling Environment

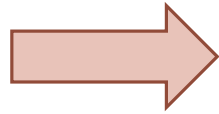
Background

- ❑ Kyoto city is located in the central part of Japanese Archipelago. The city had enjoyed its prosperity as the capital of Japan until about 150 years ago.
- ❑ Kyoto has the 7th largest population in Japan with about 1.4 million people.
- ❑ Kyoto is an international cultural sightseeing city, visited by 50 million tourists per year and a representative tourist spot in Japan.



Transport policy has been changed

Car
dependent



Put priority in people
and public transport

The transport policy in Kyoto City has been changed in a couple of decades to put priority on pedestrians and public transport.

In order to strongly promote “attractive, people-centered city development”, the Comprehensive Transport Strategy “**Kyoto, enjoyed by walking**” was formulated.

The basic philosophy is to realize the city and lifestyle centered on “walking” by shifting away from automobiles, through various suppressive measures including traffic restriction of private cars.

Volume of traffic by walking

About 7,000 pedestrians on the road of 7.0 m wide*1

Volume of traffic by passenger cars

About 2,200 people on the road of 15.0 m wide*2

- ❑ Pedestrians are concentrated in narrow sidewalks in urban downtowns
- ❑ Pedestrians and automobiles are not in good order
- ❑ Concern in the safety and comfort level of pedestrians



Shijo-Dori Street (Shijo Takakura)

Congestion in Shijo-Dori Street



Sanjo-Dori Street

Former traffic situation in downtown

BROADENING SHIJO-DORI STREET SIDEWALKS

One of the symbolic projects among 88 projects in the comprehensive transport strategy is “Broadening Shijo-Dori Street Sidewalks”.

Shijo-Dori Street is the most attractive and busy street in Kyoto City, however its sidewalks are narrow which could not allow citizens and visitors to comfortable walking.

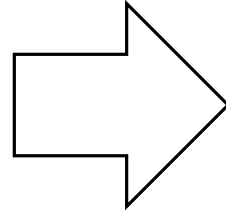


Source: Kyoto Shimibun

Shijo-Dori which had 4 carriageways with narrow sidewalks before the project has been changed to 2 carriageways with wider sidewalks after the projects.

The one of the characteristics of the project is street space reallocation without any new street construction such as a bypass.

Broadening sidewalks without any road construction in large cities is the first case in Japan, though it is not excellent from global point of view.



Shijo-Dori Street, "before and now"

COMPLETION OF SHIJO-DORI PROJECT

After several times of pilot programs and **hard discussion and negotiation** about ten years' duration, the construction work has been completed successfully in October 2015.

The project has been given awards from different academic societies such as Japan Civil Engineers and City Planning Institute of Japan and so on.



Monument erected at Shijo-Dori Street

FORMER SITUATION ALONG SHIJO-DORI

Roadside Situation along Shijo-Dori

No. of people using trains/buses

Hankyu	Karasuma Station	80,679people /day
Subway	Shijo Station	88,811people /day
City bus	Shijo-Karasuma	12,359people /day

No. of people using buses

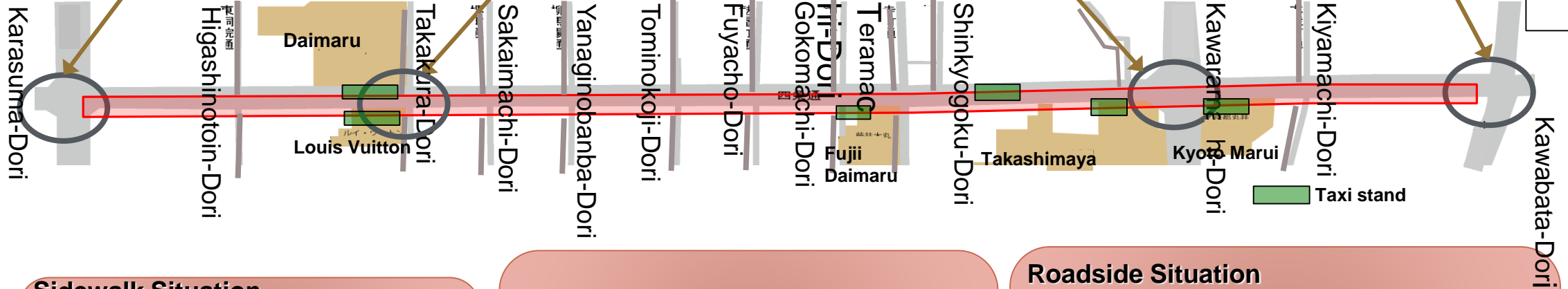
City bus	Shijo-Takakura	9,818people /day
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No. of people using trains

Keihan Gionshijo Station	50,218people /day
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No. of people using trains/buses

Hankyu	Kawaramachi Station	68,974people /day
City bus	Shijo-Kawaramachi	25,892people /day



Sidewalk Situation

- Sidewalk width: 3.5m each side (total: 7m)
- No. of pedestrians: 40,214 people/12 hours
- Many bus stops

Road Situation

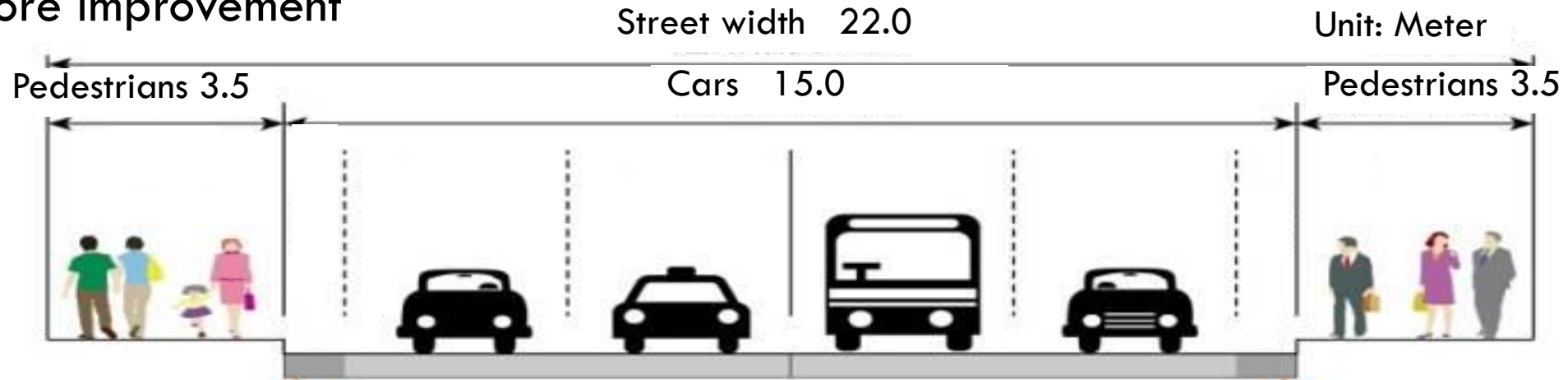
- Road width: 15m (4 vehicle lanes)
- Traffic volume: 12,937 vehicles/12 hours, comprising 9,240 cars, 1,340 buses, and 2,357 freight vehicles

Roadside Situation

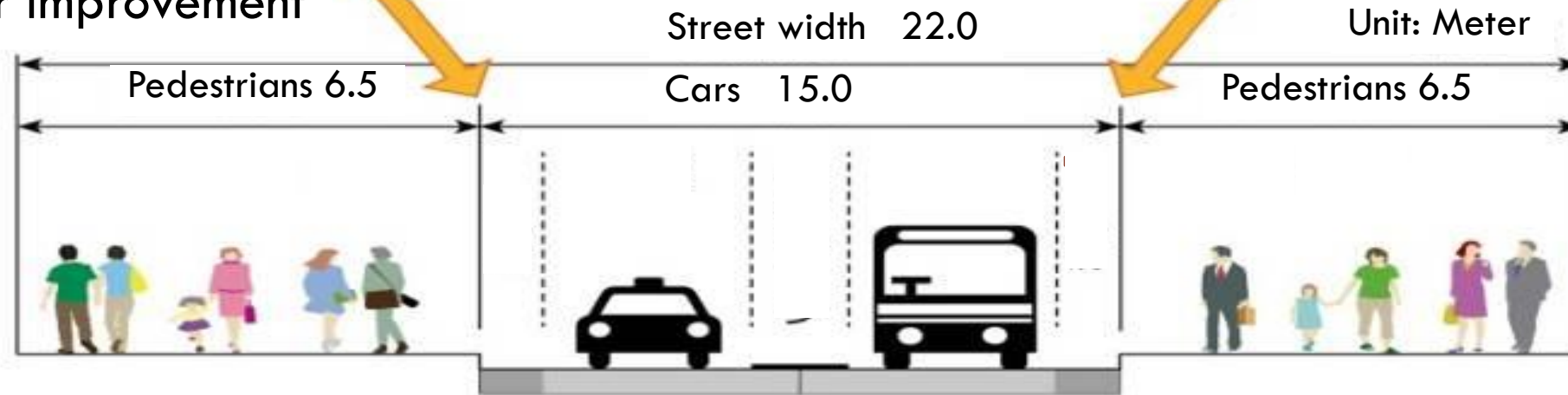
- Along the roadside is the Shijo Han'eikai Shopping Street, and there are many large commercial facilities.
- Located in a historically central city district, the area is organized into 10 shopping street promotion associations.

Major contents of the improvement of Shijo-Dori project

Before improvement

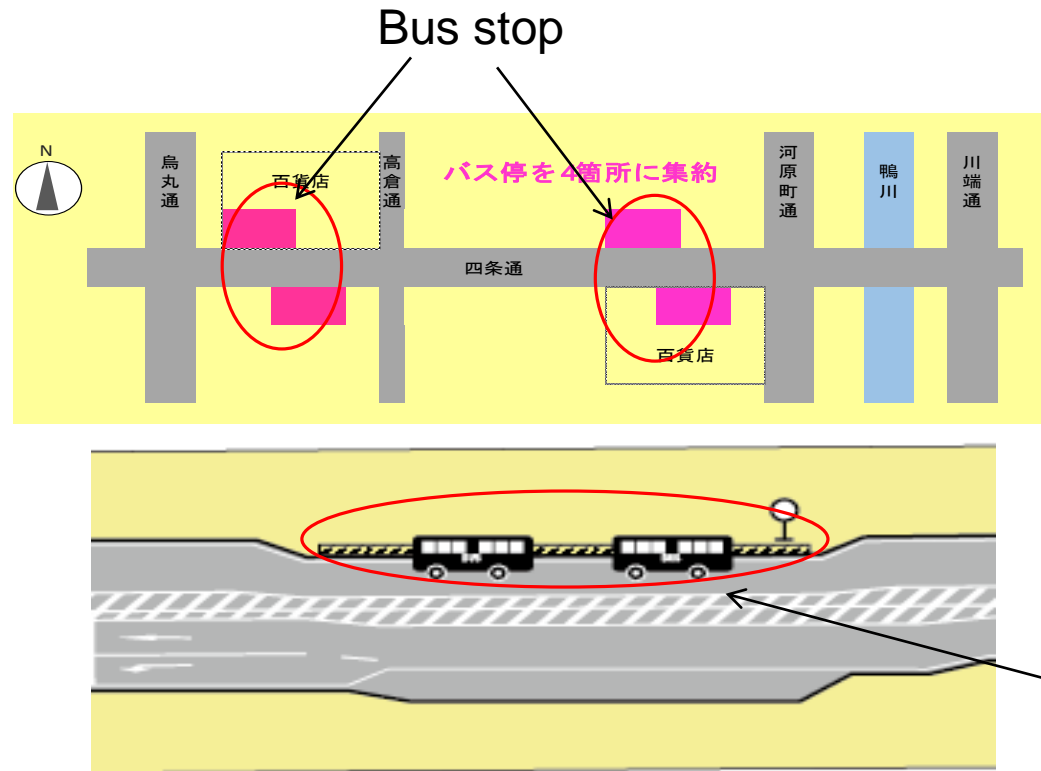


After improvement



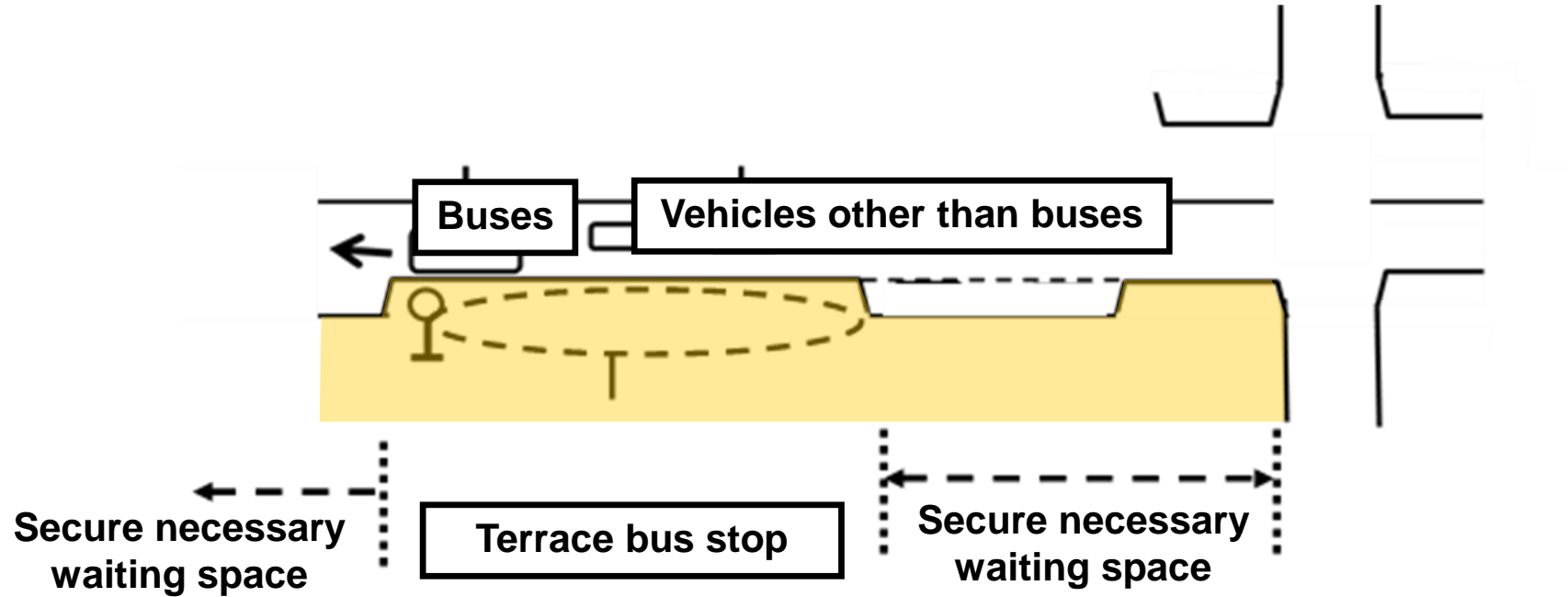
4 carriageways with narrow sidewalks → 2 carriageways with wider sidewalks

Major contents of the improvement of Shijo-Dori project



- 16 bus stops were put together to 4 stops located near the entrances of subway stations and large shopping facilities, in order to improve accessibility
- Terrace type bus stop

Bus Stop Configuration

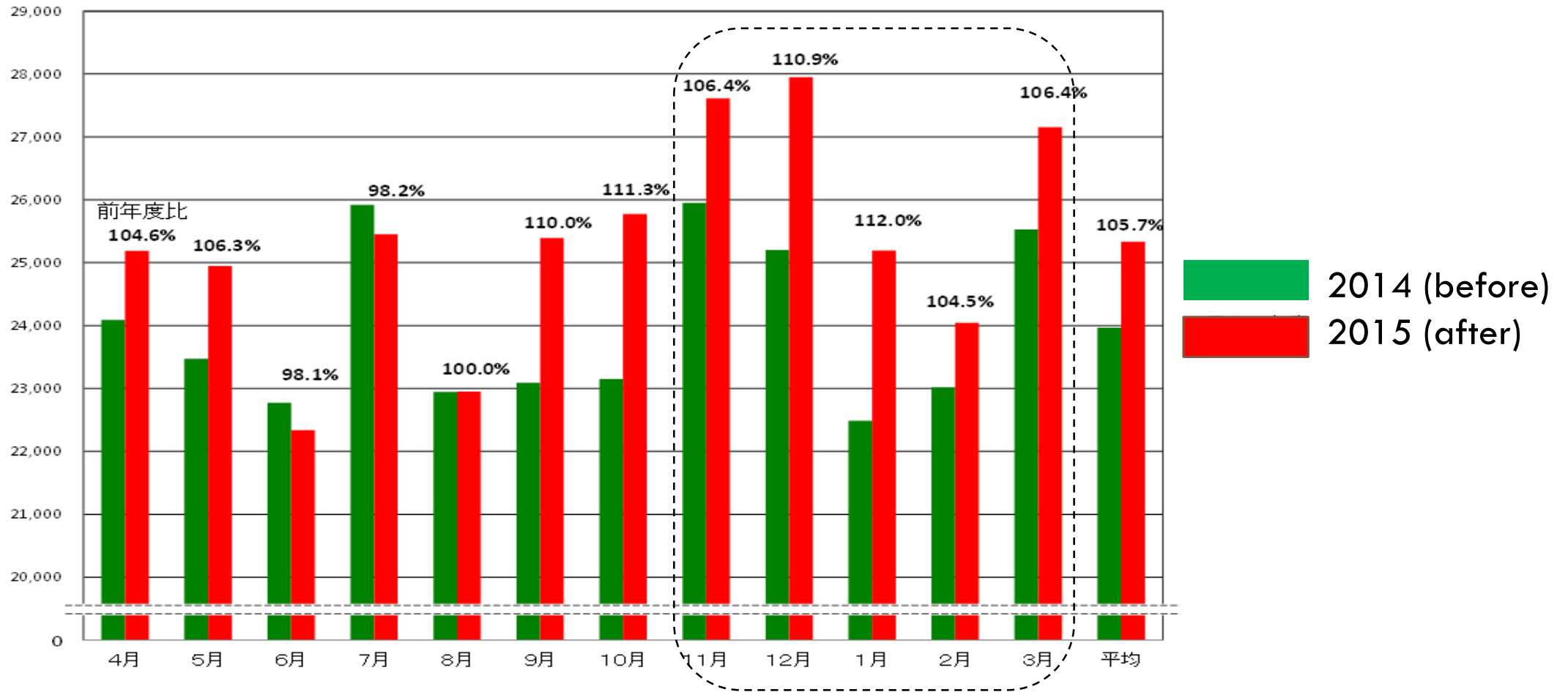


In order to enhance accessibility to bus stops and improve the smooth operation of city busses as well as the environment for people waiting for busses, terrace bus stops have been introduced.

Evaluation of Shijo-Dori Project

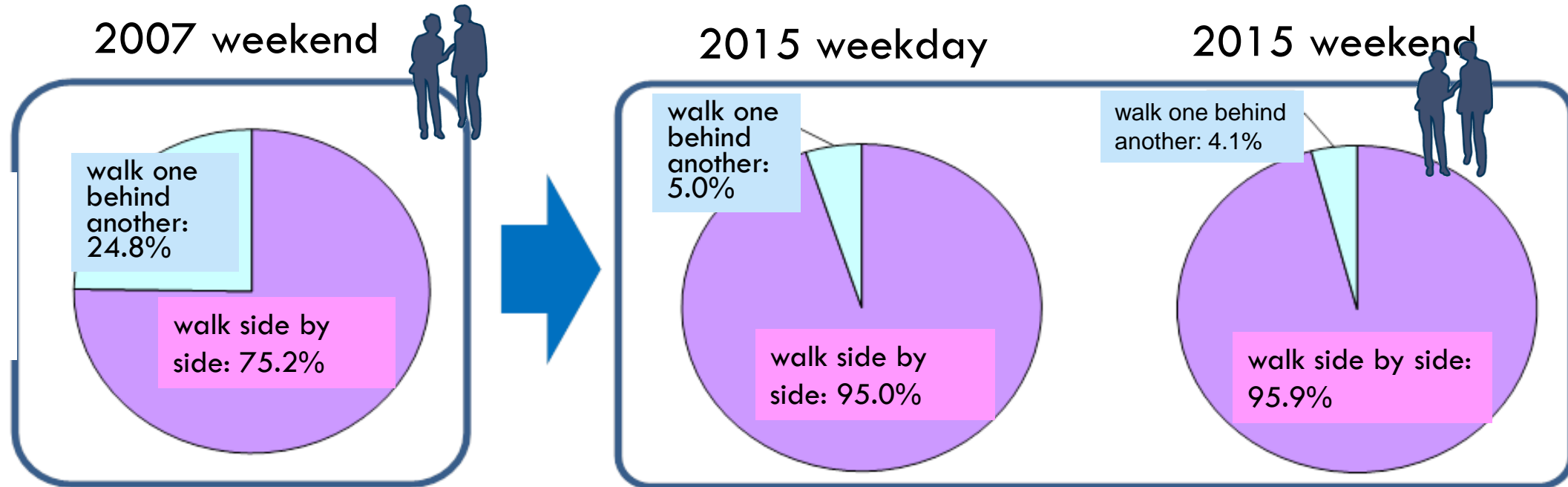
	Viewpoint of evaluation	Evaluation index
Pedestrian	Can pedestrians walk pleasantly with friends, families?	(A) Pedestrian traffic volume (B) Stand side by side in two rows (C) Walking speed (D) Evaluation by pedestrians
Public transport	Dose the transport system changed from car priority to pedestrian priority?	(E) Required time by bus (F) Number of passengers by bus
Vehicular traffic	Dose negative effects occur on traffic?	(G) Vehicular traffic volume
Cyclist	Dose cycling become safe mode?	

(A) Pedestrian traffic volume



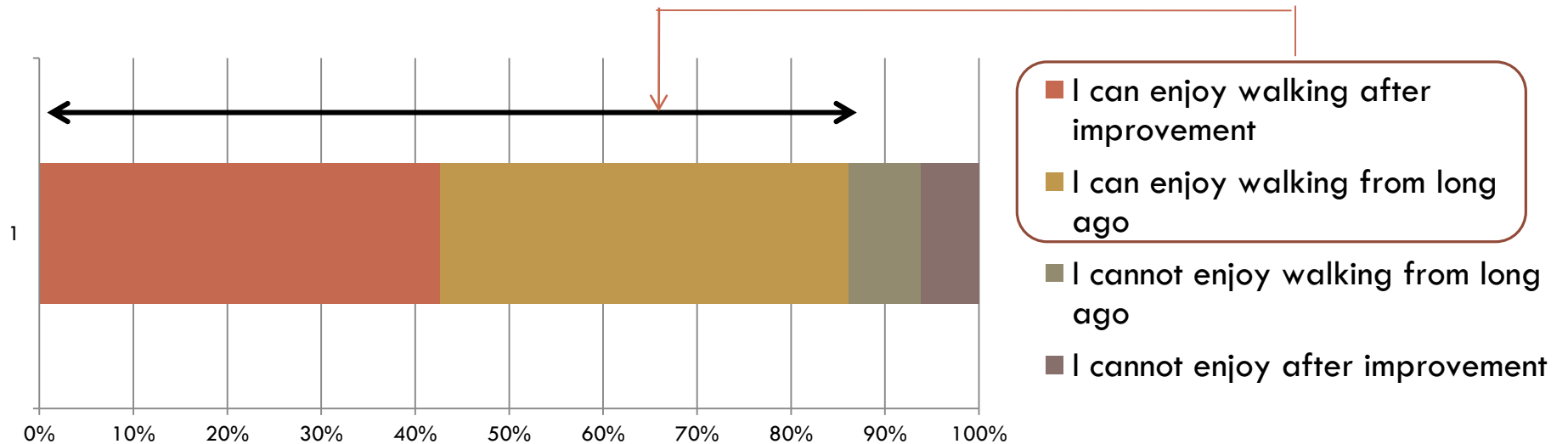
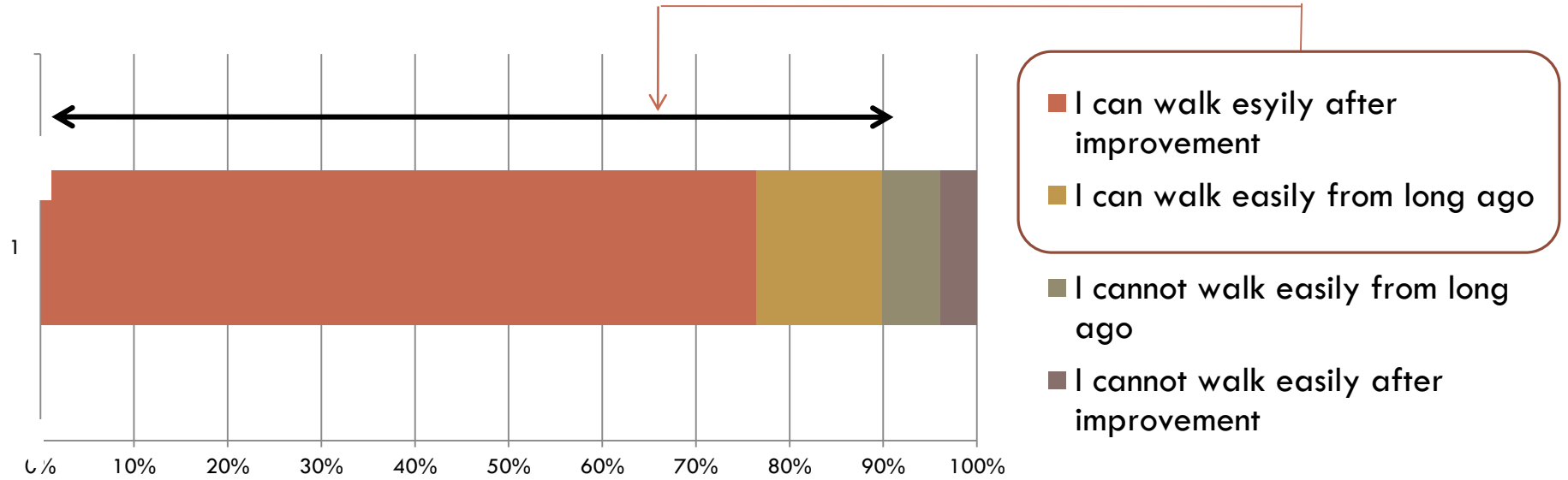
Pedestrians increased 7.7% after the completion of the project

(B) Walking form of two pedestrians



Walking environment has been improved

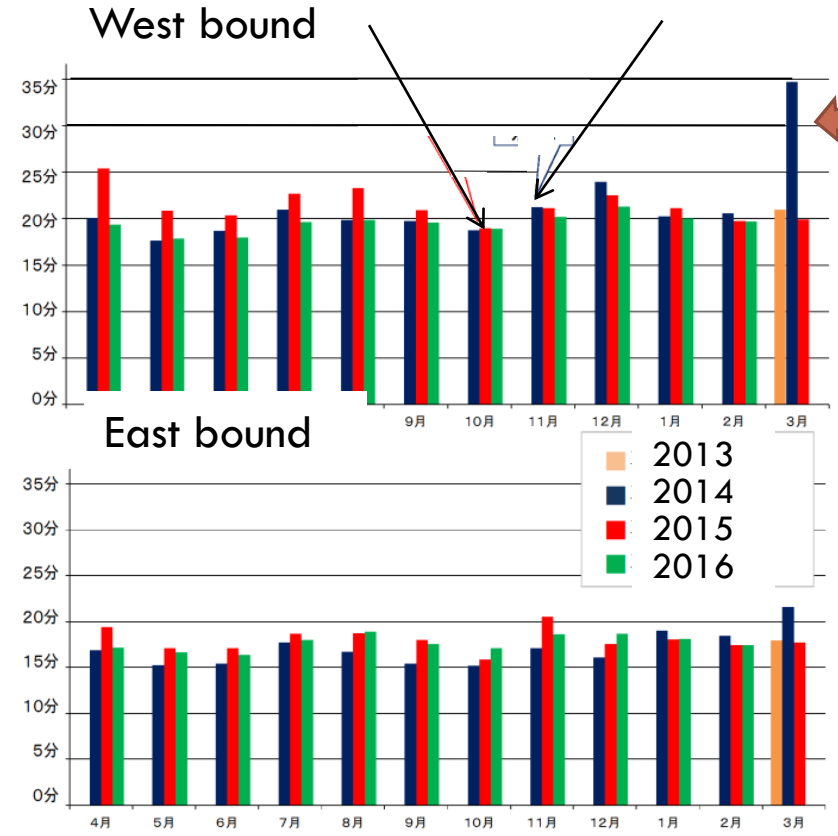
(D) Evaluation by pedestrians



(E) Required time by bus

Completion of Construction work (October 2015)

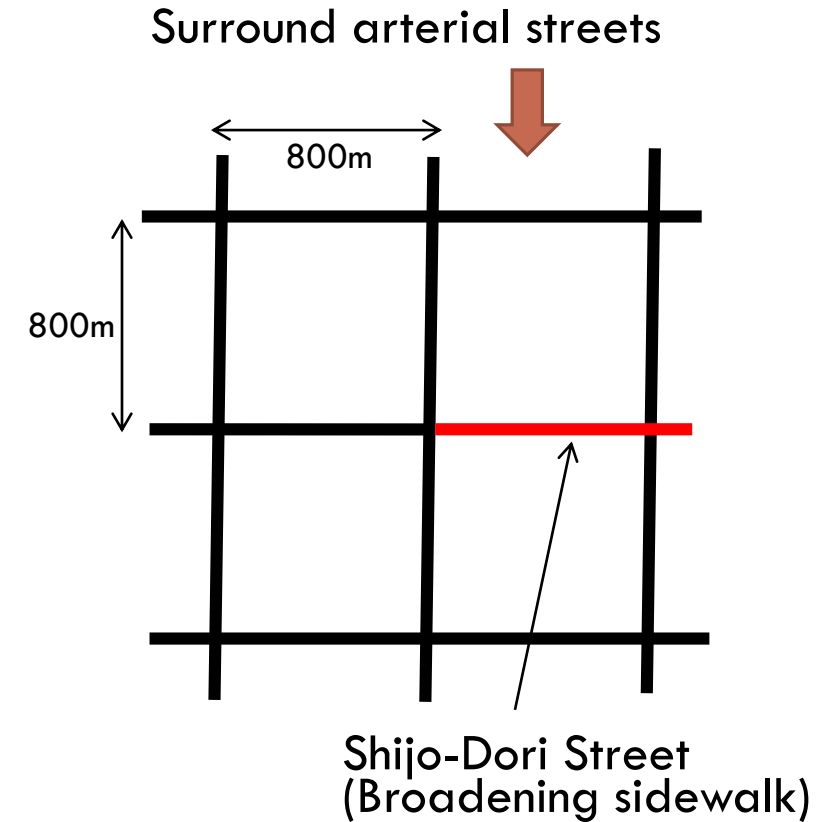
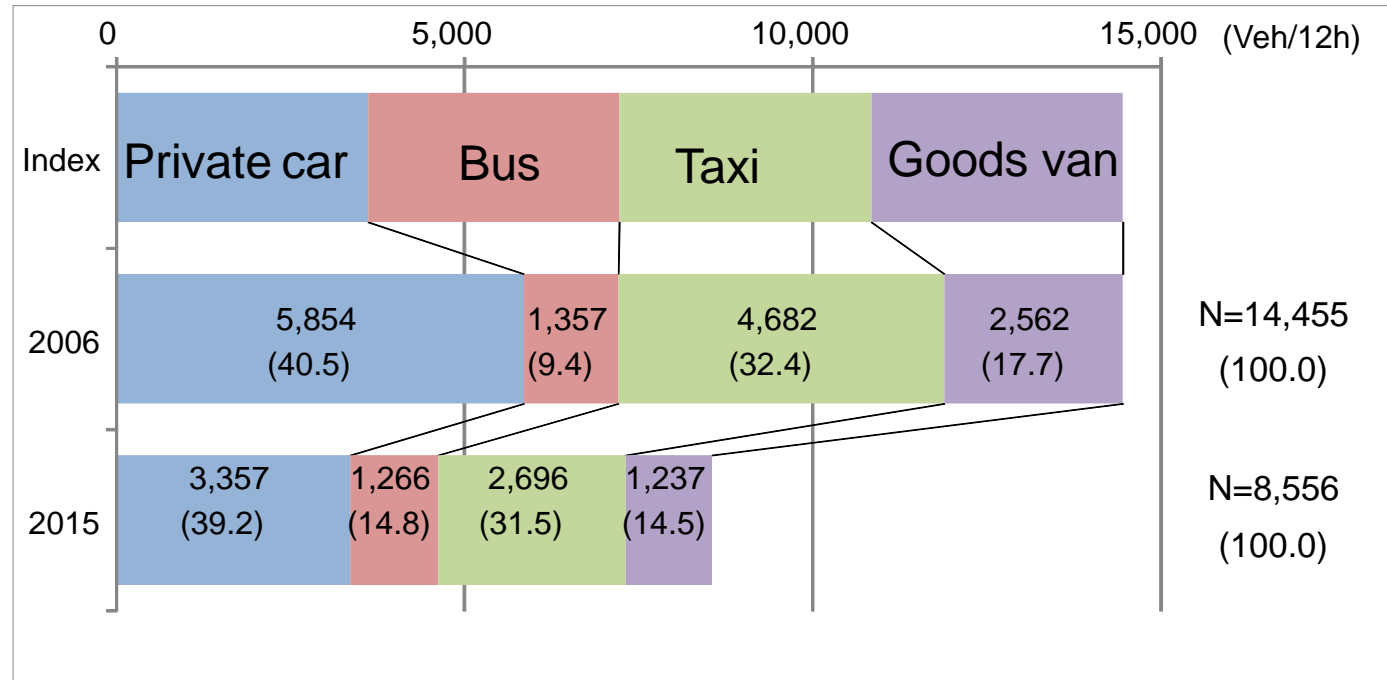
Beginning of Construction work (November 2014)



Large delay happened in the spring tourist season

At the beginning of construction work, very large delay happened. But several improvements of guidance system has been effective to solve the problem.

(G) Reduction of traffic flow



Traffic flow reduction of Shijo-Dori Street: 40% in 2015 comparing with 2006

Traffic flow reduction of the surrounding arterial streets: 10%~20%

Traffic flow reduction of Shijo-Dori Street does not have influence on traffic congestion on the surrounding arterial streets

WHY DOES THE BROADENING SHIJO-DORI STREET SIDEWALKS ATTRACT ATTENTION?

- (A) Sidewalk widening has been completed without
 - (a) any construction of additional road and,
 - (b) traffic regulation (only guidance for drivers to avoid Shijo-Dori Street.
- (B) Total street width is not changed.
- (C) The reduction of traffic flow of Shijo-Dori and the surrounding streets.
- (D) Walking condition is greatly improved.

WHAT DIRECTION IS DESIRED FOR SHIJO-DORI PROJECT

Widening sidewalk is not the goal of the project.

The final goal is the introduction of transit mall. The suitability of the introduction was examined through a pilot program, but the result shows that it is difficult in current situation. In the future, transit mall introduction should be aimed.

Shijo-Dori Area includes Shijo-Dori street and the surrounding area. The streets in surrounding area have been improved now, however more effort is necessary for them, in order to realize a “Kyoto, enjoyed by walking” that prioritizes people and public transport.

IMPROVEMENT OF CYCLIST ENVIRONMENT

Improvement of cyclist environment has been conducted in Kyoto City, including parking places for cycles and **bike lane network**.

Why now?

In Japan, cycles could use sidewalks from 1970s when more than sixteen thousand persons were killed a year by traffic accidents. However, in order to make pedestrians and cyclists safe, the national government has decided to remove cycles from sidewalks to their own spaces. The current program for cyclists of Kyoto City adopts the same policy.

Primary Distributor



District Distributor



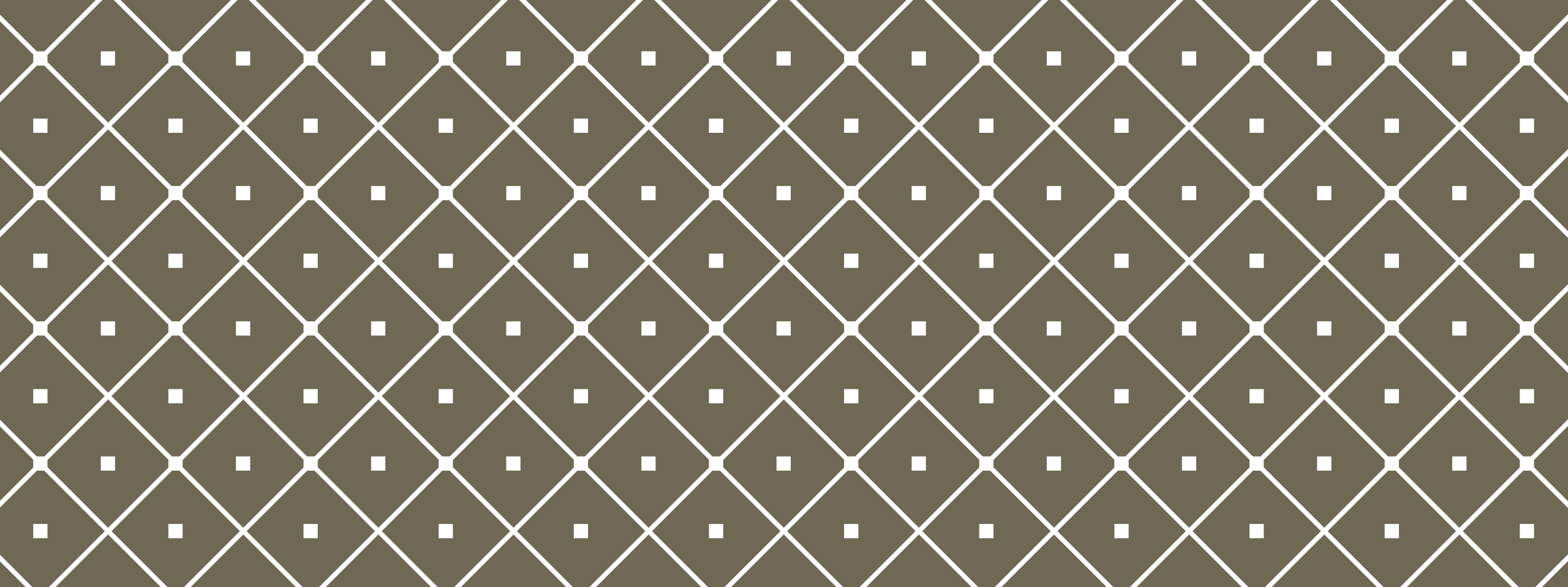
Local Distributor



Thank you



Shijo-Dori Street NOW



SUPPLEMENTARY INFORMATION

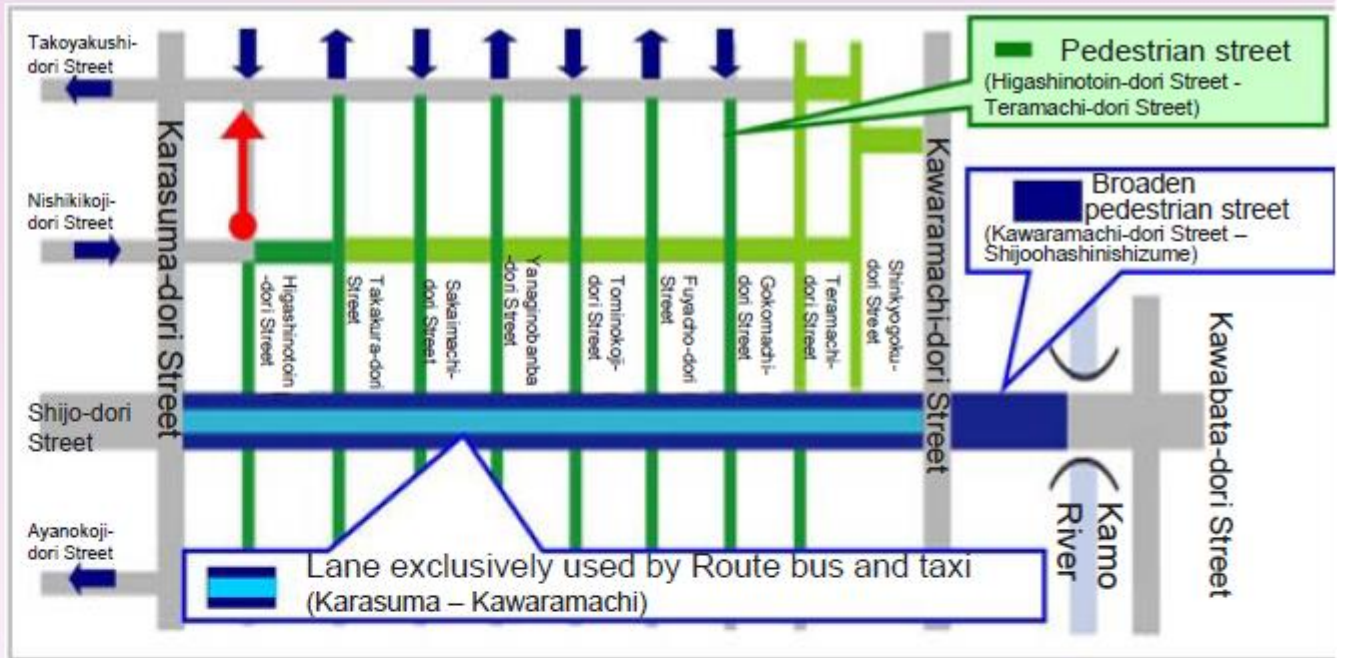


PILOT PROGRAM HAD SPECIAL IMPORTANCE IN SHIJO-DORI STREET SIDEWALKS

In order to realize “attractive, people-centered city development”, Shijo-Dori street is desired to be a transit mall. Transit mall was the major concept of the pilot program.

However, the pilot program made clear that several problems should be solved. For example, since so called “Historical downtown” surrounding Shijo-Dori street is a business and residential area, it is difficult to restrict car usage without any countermeasures.

- ① Realize spacious sidewalk
Make a transit mall out of Shijo-Dori Street
- ② Suppress transit traffic
Designate narrow streets as pedestrian roads
- ③ Coexistence of pedestrians and cyclists
Set up of temporary parking space
Stricter measures to get rid of illegally-parked bicycles
- ④ Realize more convenient bus service
- ⑤ Designate the common spaces for trucks to drop off goods etc.



Shijo-Dori Street in the past



Shijo-Dori Street in times of pilot program



A narrow street in the past



A narrow street in times of pilot program

SURROUNDING AREA

Since the area surrounding Shijo-Dori Street, which is called as the historical downtown, consists of narrow streets, it is necessary to improve this area at the same time of Shijo-Dori sidewalk broadening project.

The aim of the improvements of Shijo-Dori is not only the widening of sidewalks, but also improvement of surrounding area as shown the next slide, in order to enhance the convenience of public transport and securing safe and comfortable pedestrian spaces along narrow streets in the Shijo-Dori area.



Surrounding area
(Historical downtown)

THEORETICAL BACKGROUND OF STREET SPACE REALLOCATION

Major streets in Kyoto city were investigated

Based on principal component analysis and occupancy analysis, Shijo-Dori street has suitable street which is improved by street space reallocation technique

The brief explanation the technique is as follows:

“Occupancy indicator“ shown below enables us to examine the suitability of allocation of road space.

$$Q_{si} = \sum_k (w_k Q_{sik})$$
$$= \frac{1}{\sum_k (\ell_k d_k)} \sum_k (q_{ik} \frac{\ell_k}{V_{ik}} \bar{A}_{ik}) \quad (\text{for } i=p,b,c)$$

Tsukaguchi, H., Jung, H. : Occupancy - a new concept in residential street planning, Traffic Engineering & Control, 2002.6.