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27PM7 All On Board: How to Share Space  
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# A Study on the Shift of Bicycles from Sidewalk to Roadway

**Teppei Osada**

Assistant Professor, Utsunomiya University, Japan

**Hiroataka Koike**

Professor, Utsunomiya Kyowa University, Japan

**Hideto Hayano, Mamoru Tomoda,**

Ministry of Land, Infrastructure, Transport and Tourism, Japan

# Background

- Sharp increase of traffic accidents between bicycles and pedestrian on sidewalk.



- "Bicycle Usage Environment Creation Guidelines for Comfort and Safety" in November, 2012 (MLIT and NPA, 2012).

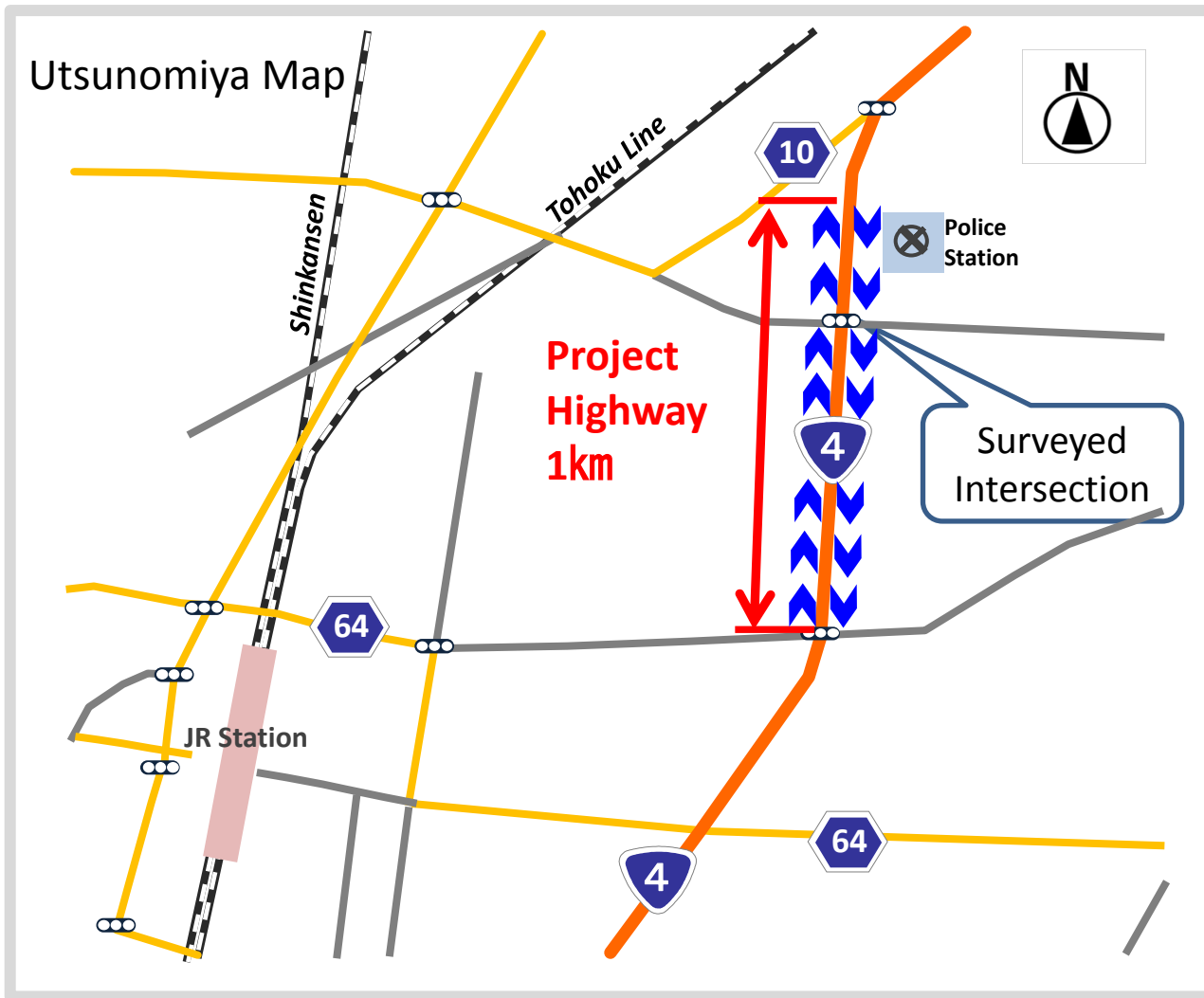


- In February 2013, Experimental implementation of the new guideline on one of the busiest highways, the National Highway Route No. 4 in Utsunomiya.

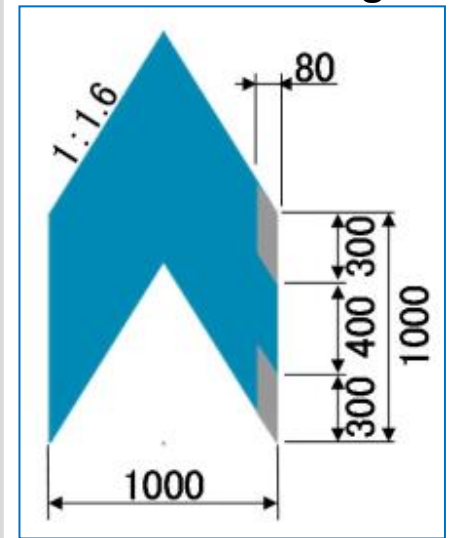


- This is the **first attempt** in Japan to implement the new guideline on the major national highway, and drew much attention nationwide.

# Study Site and Arrow Marking



## Arrow Marking



# Shift of bicycles from Sidewalk to Roadway

(From share with pedestrian to share with automobile)

**Before**



**After**

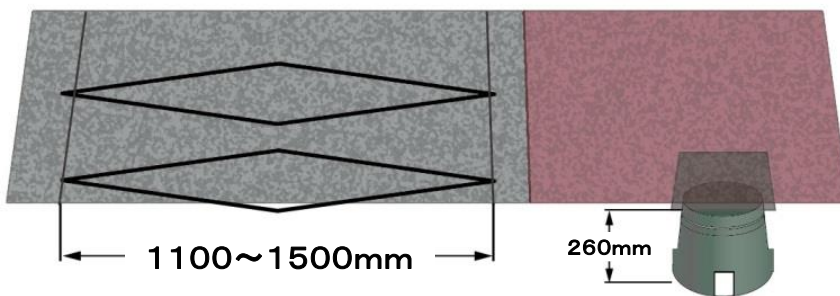


# Overview of Eco-Counter

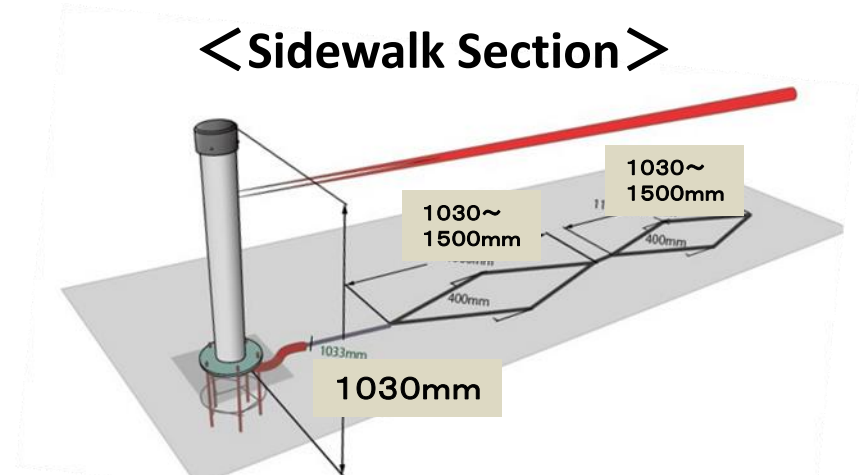
## System Configuration

	Sensors	Counting
Roadside Section	Loop sensor	Direction, speed and volume of bicycles
Sidewalk Section	Loop sensor Infrared sensor	Volume and direction of bicycles and pedestrian

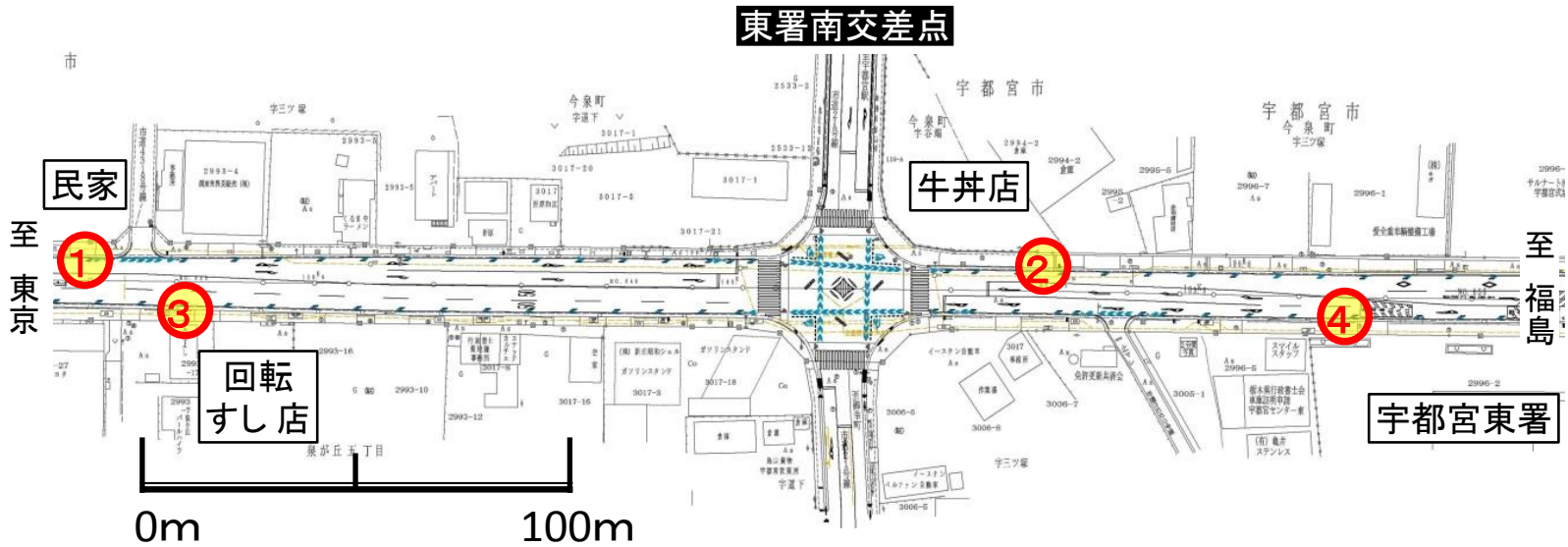
### < Roadside Section >



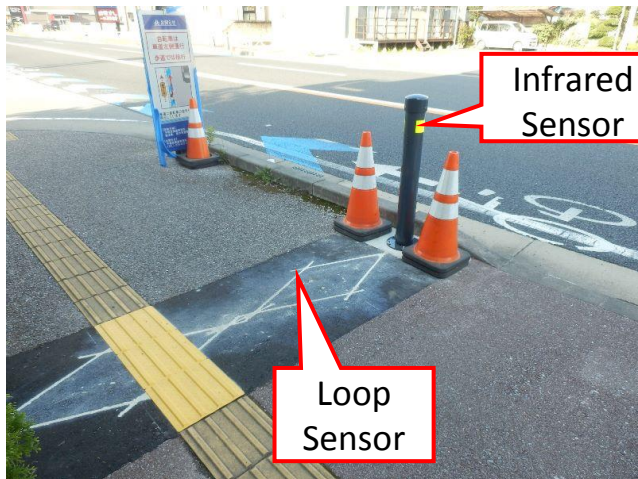
### < Sidewalk Section >



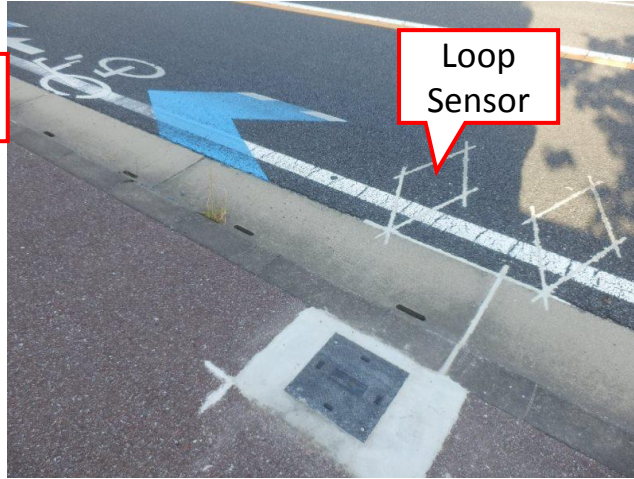
# Four Locations of Eco-Counters



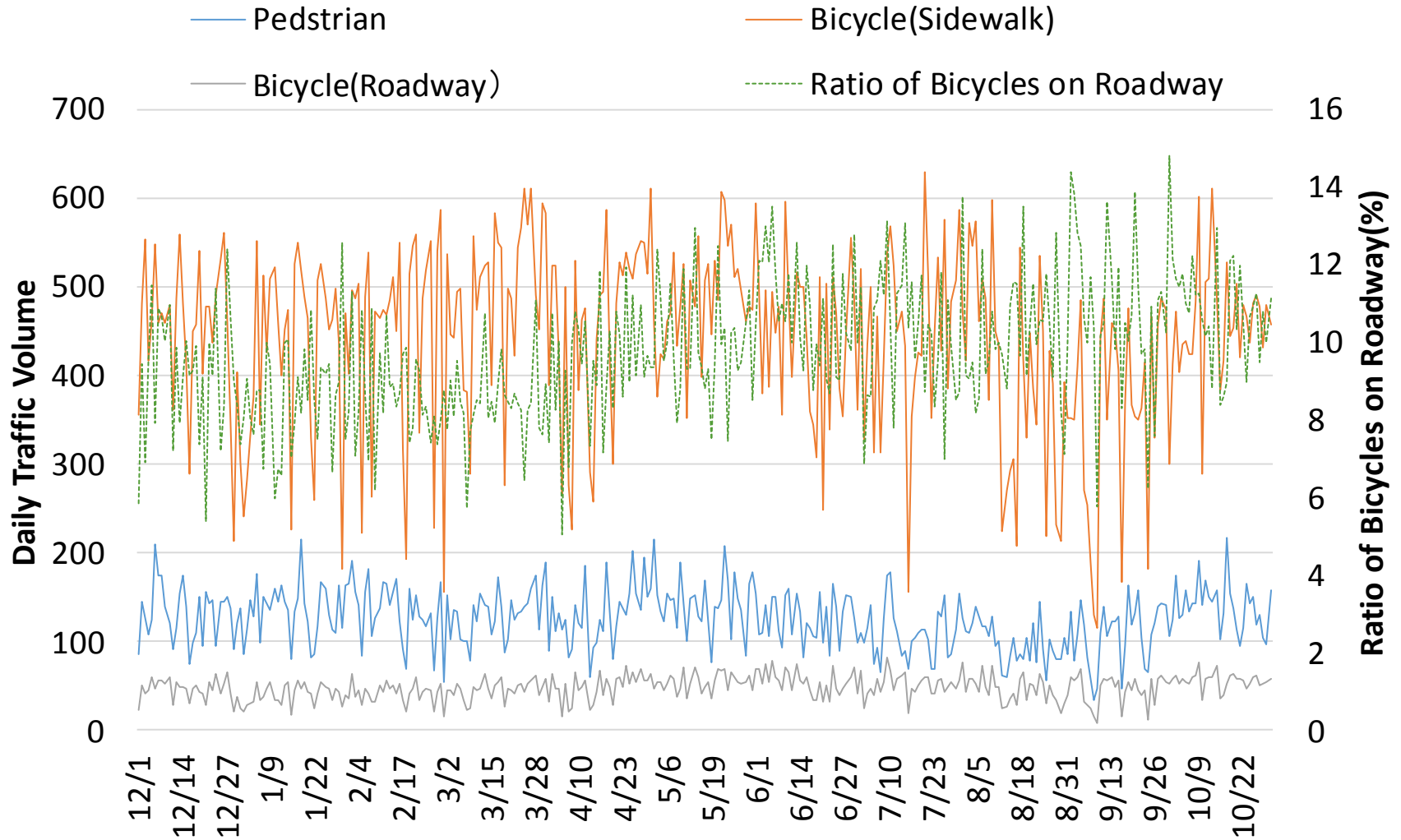
Sidewalk Section



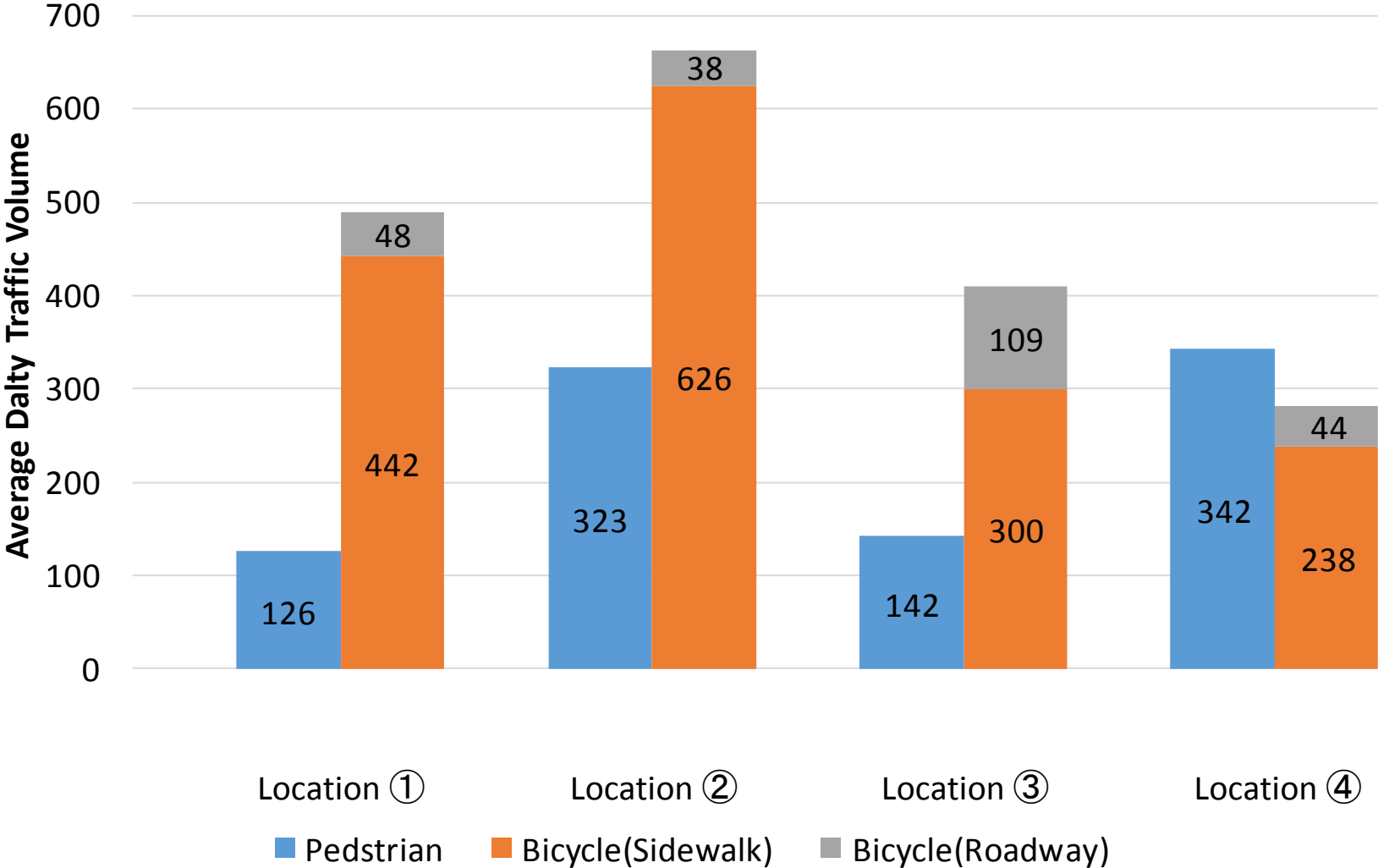
Roadside Section



# Daily Traffic Volume for Location No. 1

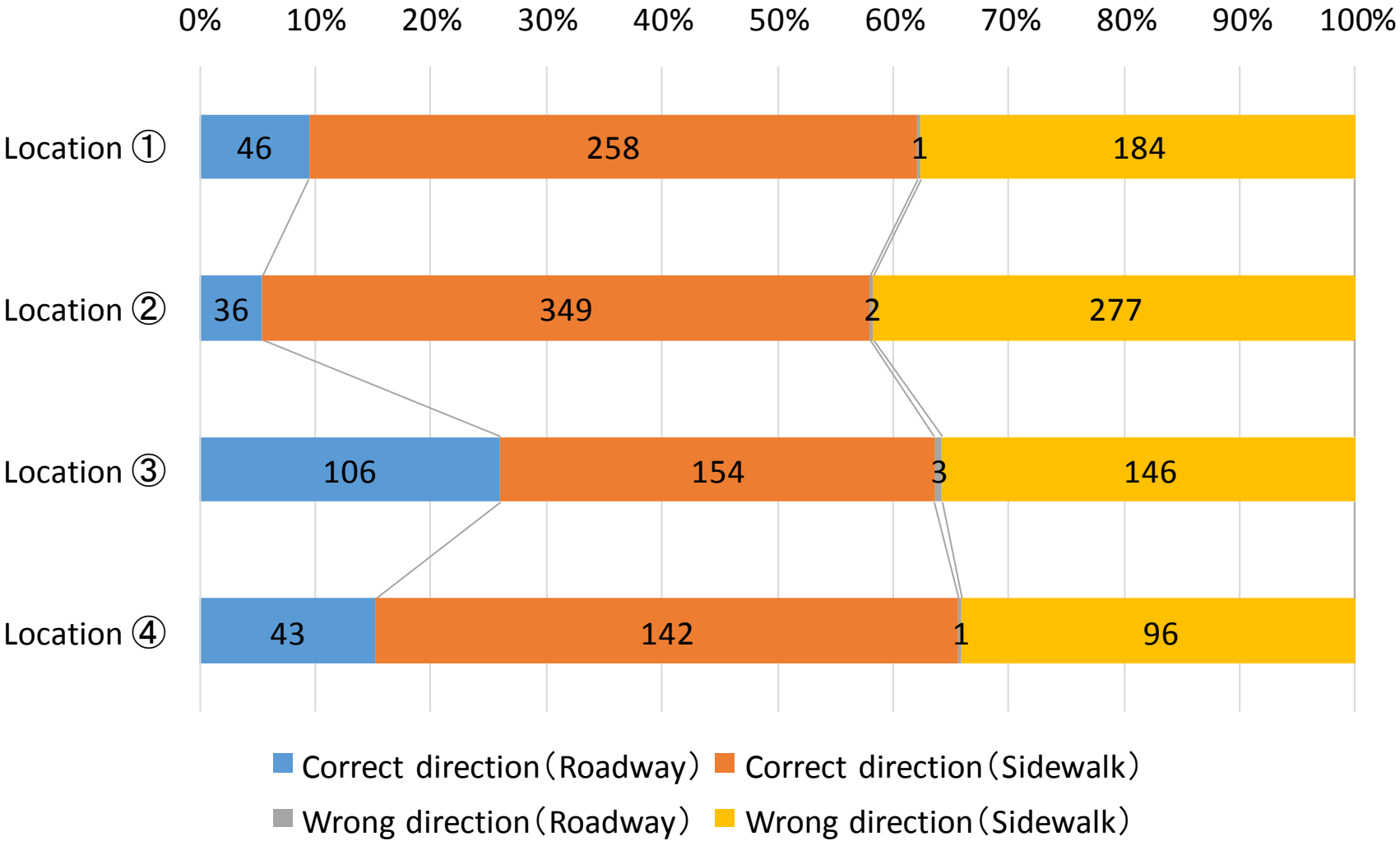


# Average Daily Traffic Volume by Location

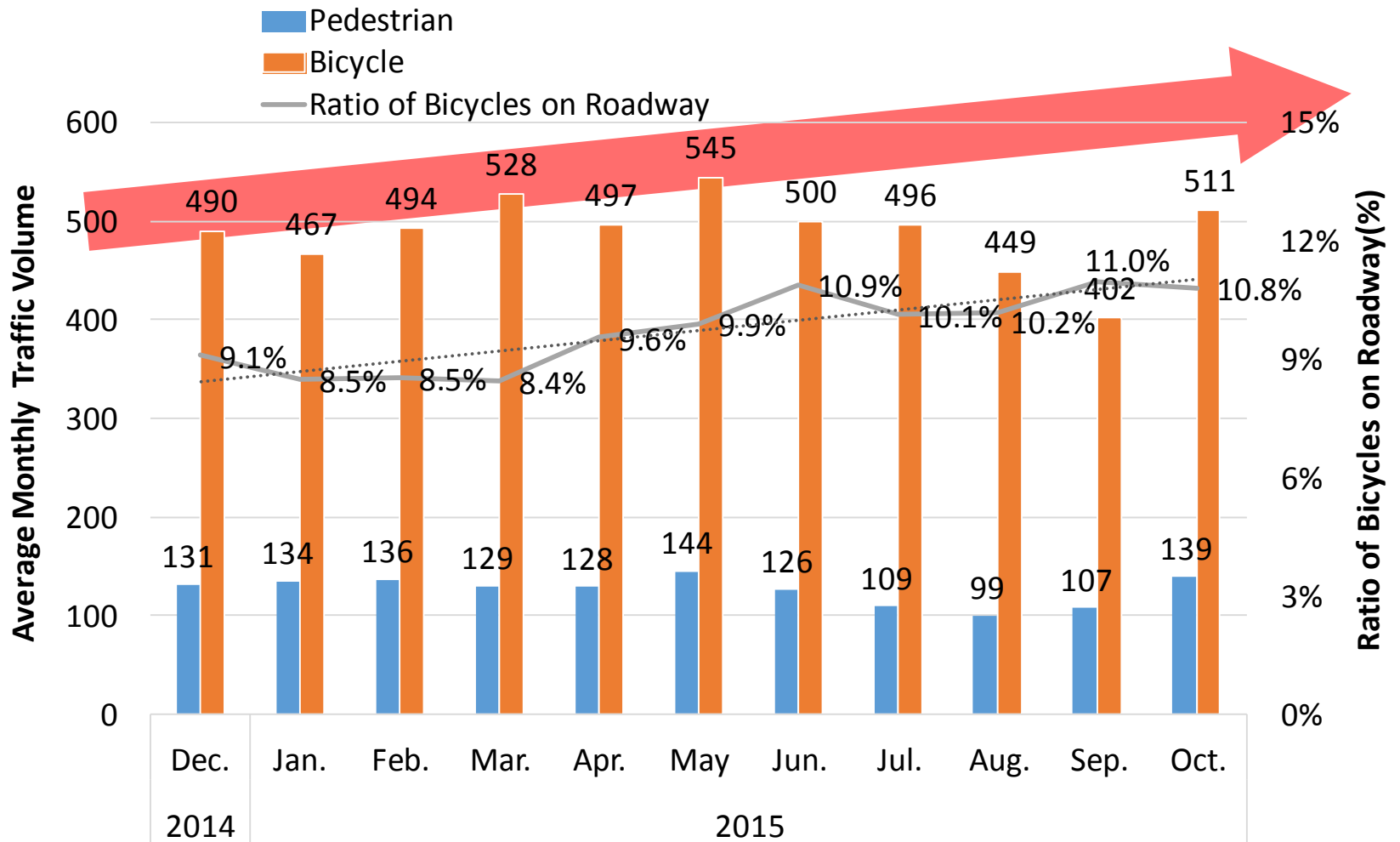




# Ratio of bicycles by direction



# Ratio of Bicycles on Roadway for Location No. 1



# Conclusion

- Sharp increase of traffic accidents between bicycles and pedestrian on sidewalk.
- Nationwide challenge to shift bicycles from sidewalk to roadway under a new guideline.
- First attempt on one of the busiest highways using arrow markings on the left side of roadway in Utsunomiya.
- First continuous measurement of bicycles on sidewalk and roadway as well as pedestrian using Eco-counters in Japan.
- The initial result shows the shift of bicycles from sidewalk to roadway is in progress.

# Thank You for your attention !



(It is fun to ride in Utsunomiya)

(It is fun to live in Utsunomiya)