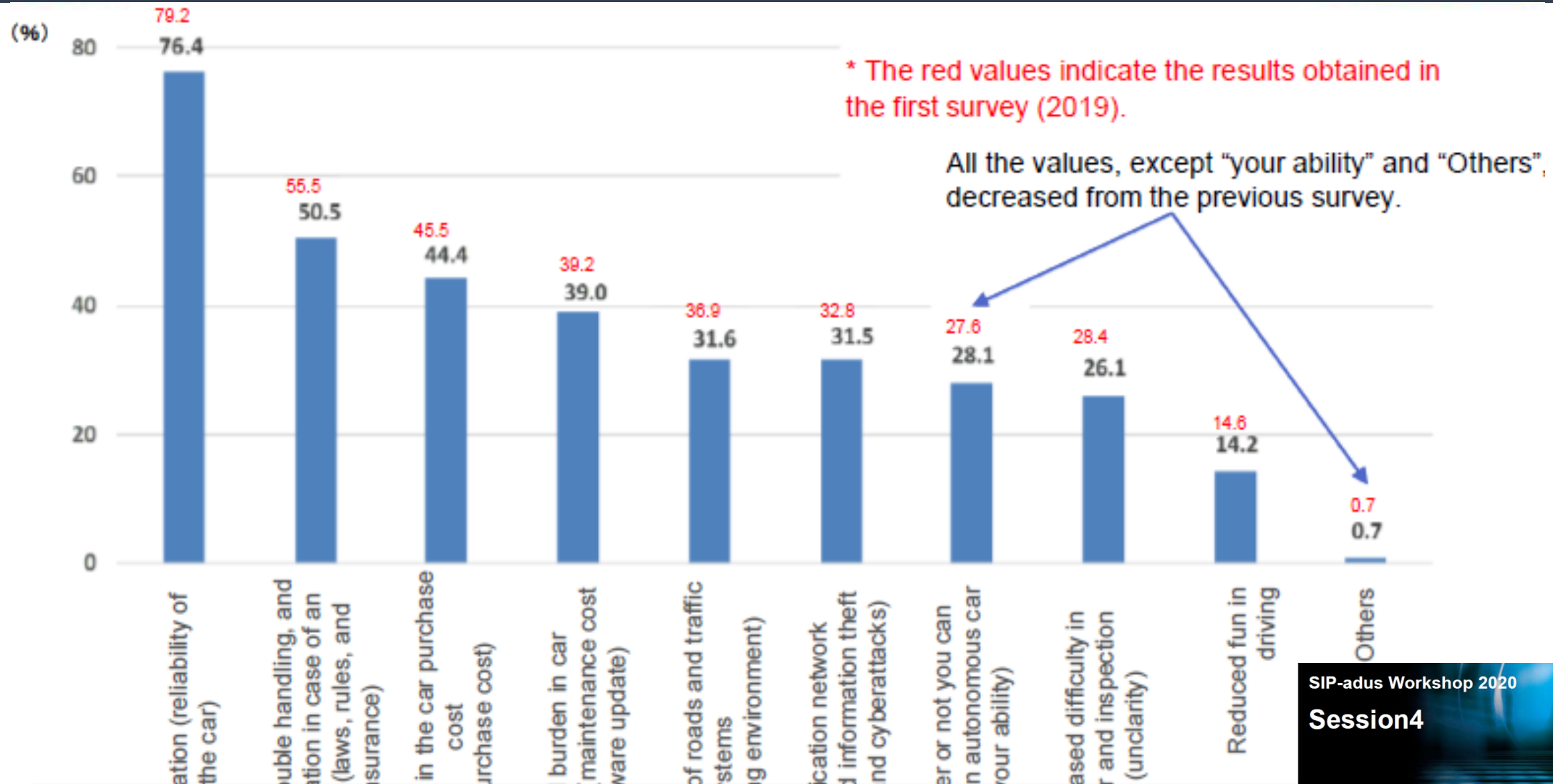


To protect vulnerable traffic participants  
"Formulation of Common Avoidance Principles to  
increase predictability"

# Concrete Anxiety about Automated Driving



- The most common answer was "Whether the vehicle operates safely (Reliability of automated vehicle)", accounting for 79.2%.

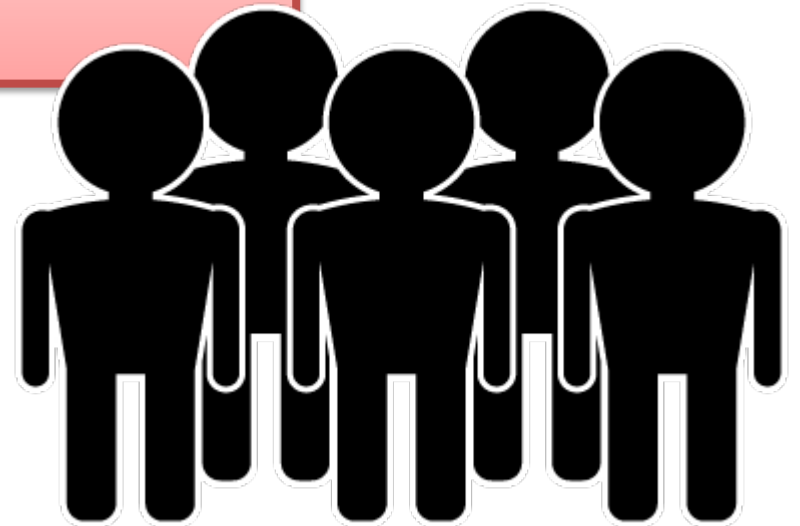
SIP-adus Workshop 2020

Session4

# Automated Vehicle



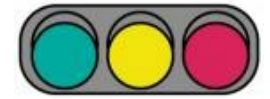
- Isn't the judgment of a non-human program (AI) different from what humans do?
- Isn't the operation of s autonomous vehicles unpredictable?



# Predictions by traffic participants



- Driving is to predict the behaviors of other traffic participants and operate the vehicle in order not to occur collisions.

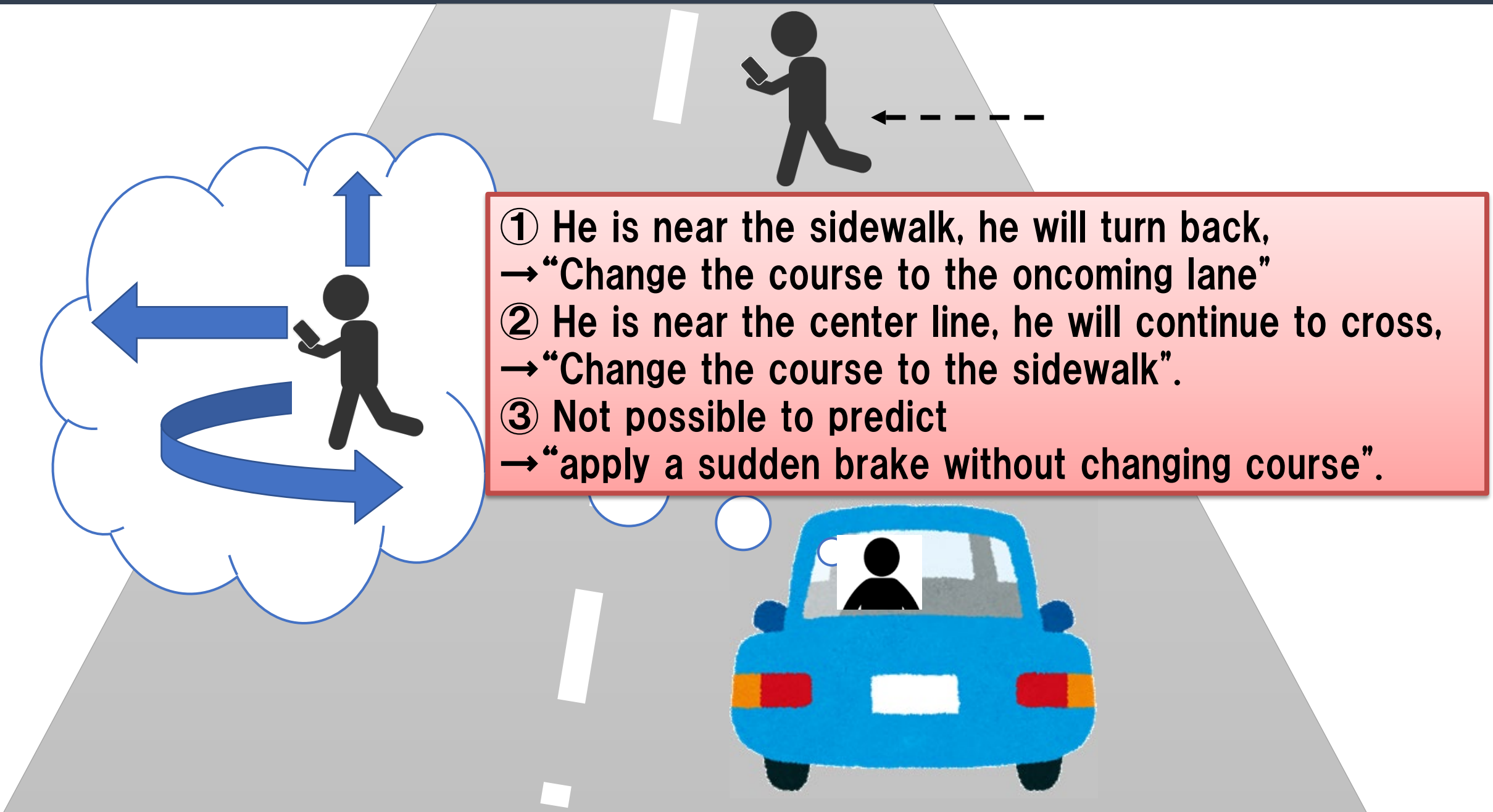


- Traffic regulations, signs, lights are important tools to assist these predictions. ("TPAT=Traffic Prediction Assistant Tools")

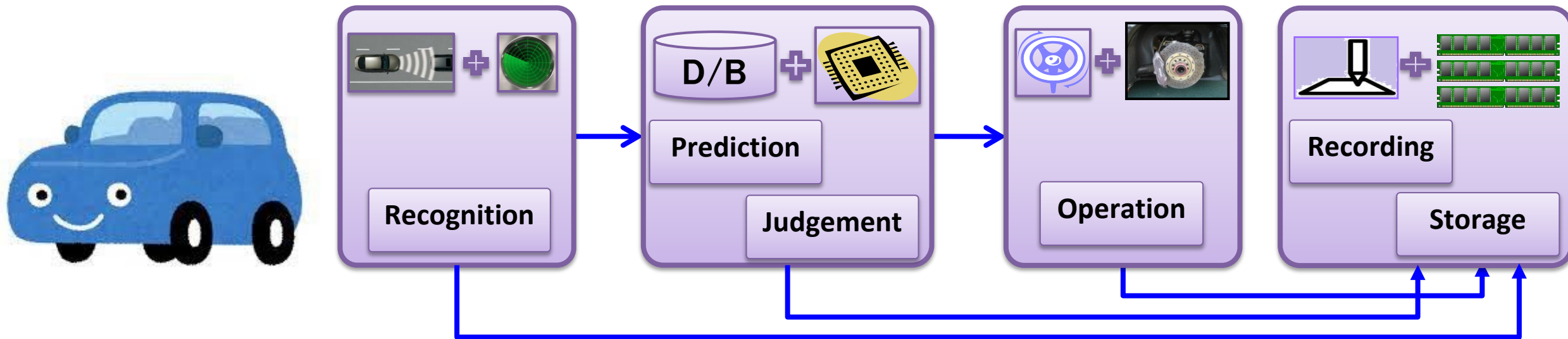
- If all the traffic participants understand and act according to the TPAT, predictions of each traffic participants will be correct and the number of accidents will be greatly reduced...

But in the real World...

# Predictions to avoid crash by human driver



# Automated Vehicle performance



Automated vehicle predicts same as human driver at the same case.



- ① He is near the sidewalk, he will turn back,  
→ “Change the course to the oncoming lane”
- ② He is near the center line, he will continue to cross,  
→ “Change the course to the sidewalk”.
- ③ Not possible to predict  
→ “apply a sudden brake without changing course”.

# Predictions to avoid crash by automated vehicle

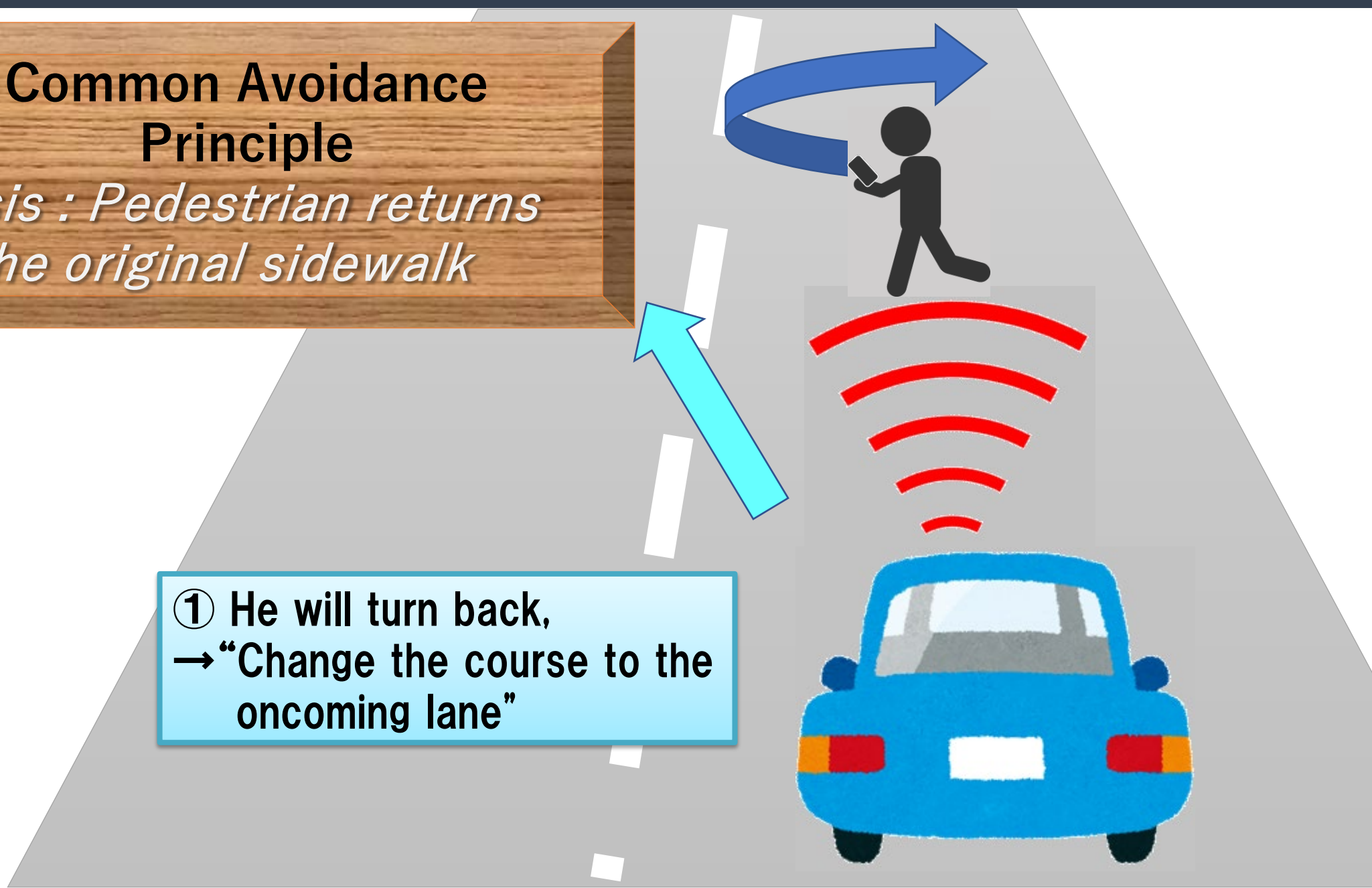
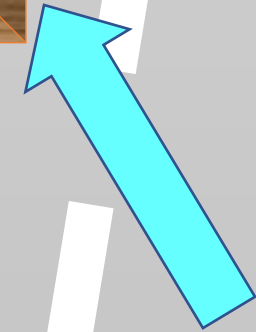


# Prediction under Common Avoidance Principle

## Common Avoidance Principle

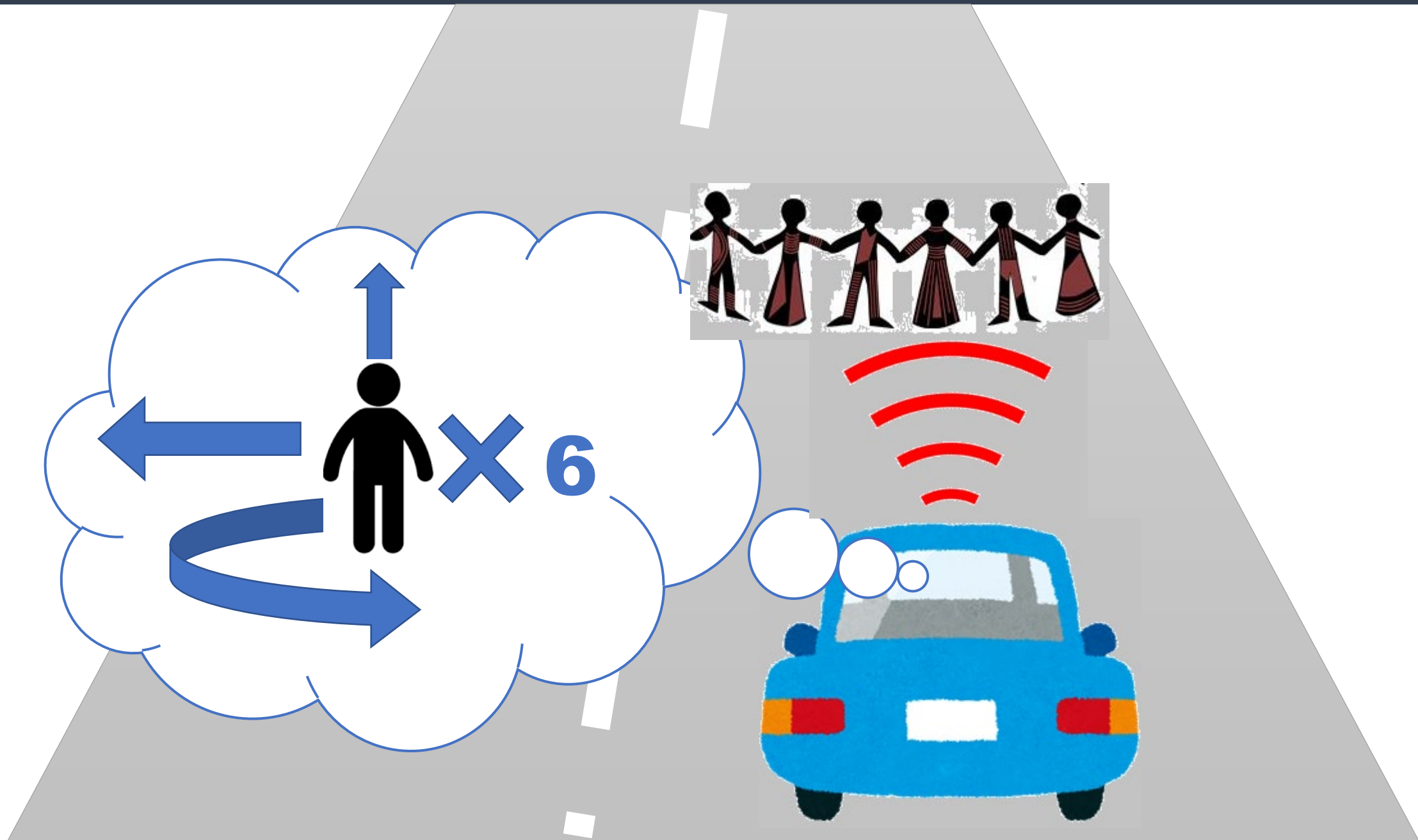
*Crisis : Pedestrian returns to the original sidewalk*

① He will turn back,  
→ “Change the course to the oncoming lane”





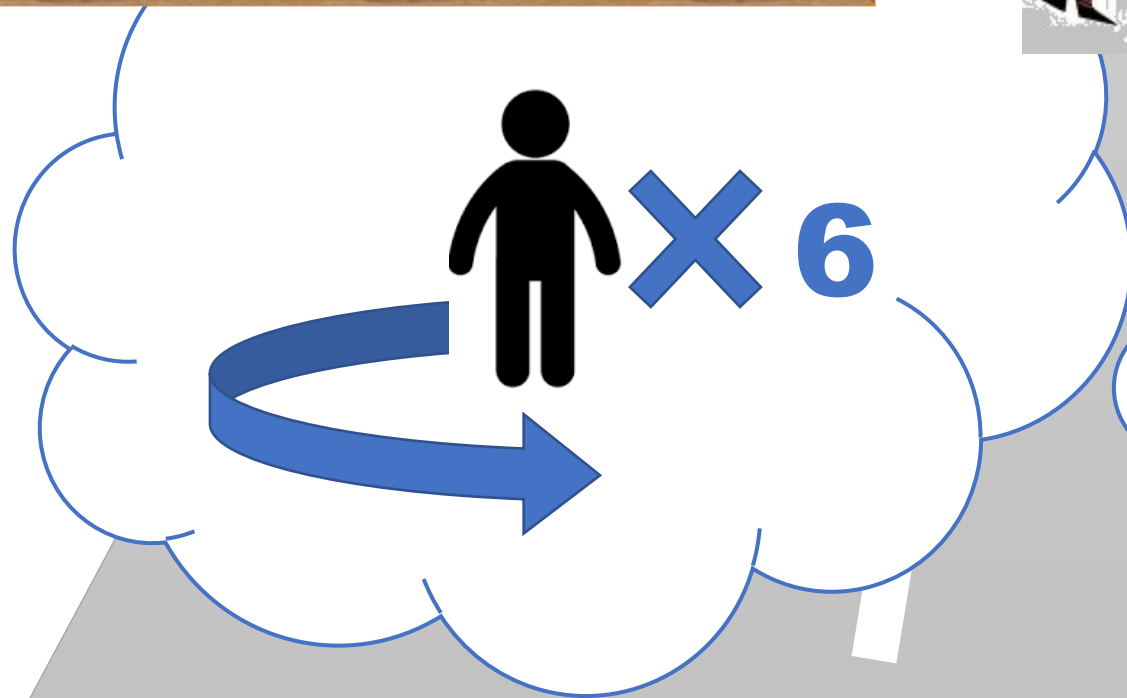
Prediction, Prediction, Prediction, Prediction, Prediction, Prediction,



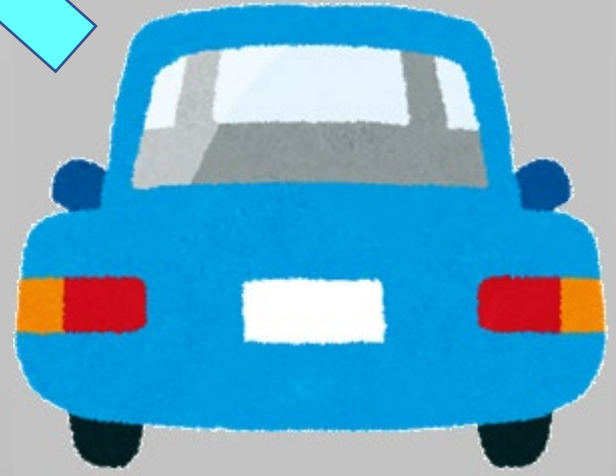
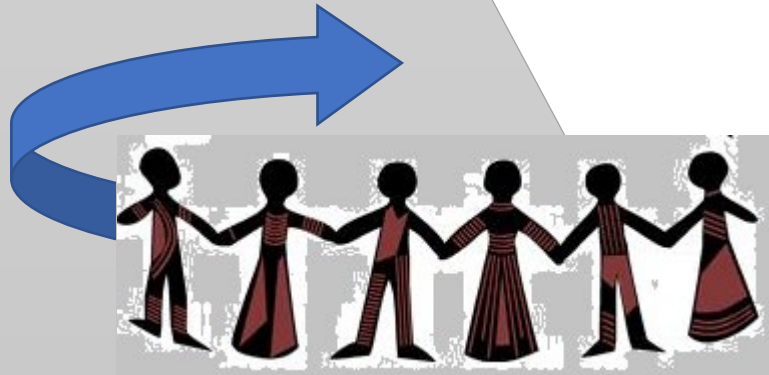
# Only one Prediction under Common Avoidance Principle

## Common Avoidance Principle

*Crisis : Pedestrian returns to the original sidewalk*



**Common Avoidance Principle**  
*Crisis : Pedestrian returns to the original sidewalk*



① They will turn back,  
→ “Change the course to the oncoming lane”

## Related/derivative matters

- It is also effective in handling accidents. In the event of an accident involving an automated vehicle, the legal liability of the automated vehicle will be pursued. "Foreseeability" is the key, whether it's in a criminal or a civil case. If the CAV has been established, the legal debate may become easier to converge.
  - There is a great advantage for developers of automated vehicle, and when considering measures to avoid collisions with pedestrians, there is currently no basic policy for predicting the behavior of pedestrians, so the program is omnidirectional. To assemble. This is important in this, but if the above common avoidance principle exists, it can be used as an element of pedestrian behavior prediction, so the program construction will be more rational.
- WP01 has the potential to contribute significantly to the development of CAP to create a safe traffic environment for all road users, especially vulnerable users. And there is a great possibility of formulating a wider variety of common principles in cooperation with WP29.**

## RRI, "Responsible Research and Innovation"

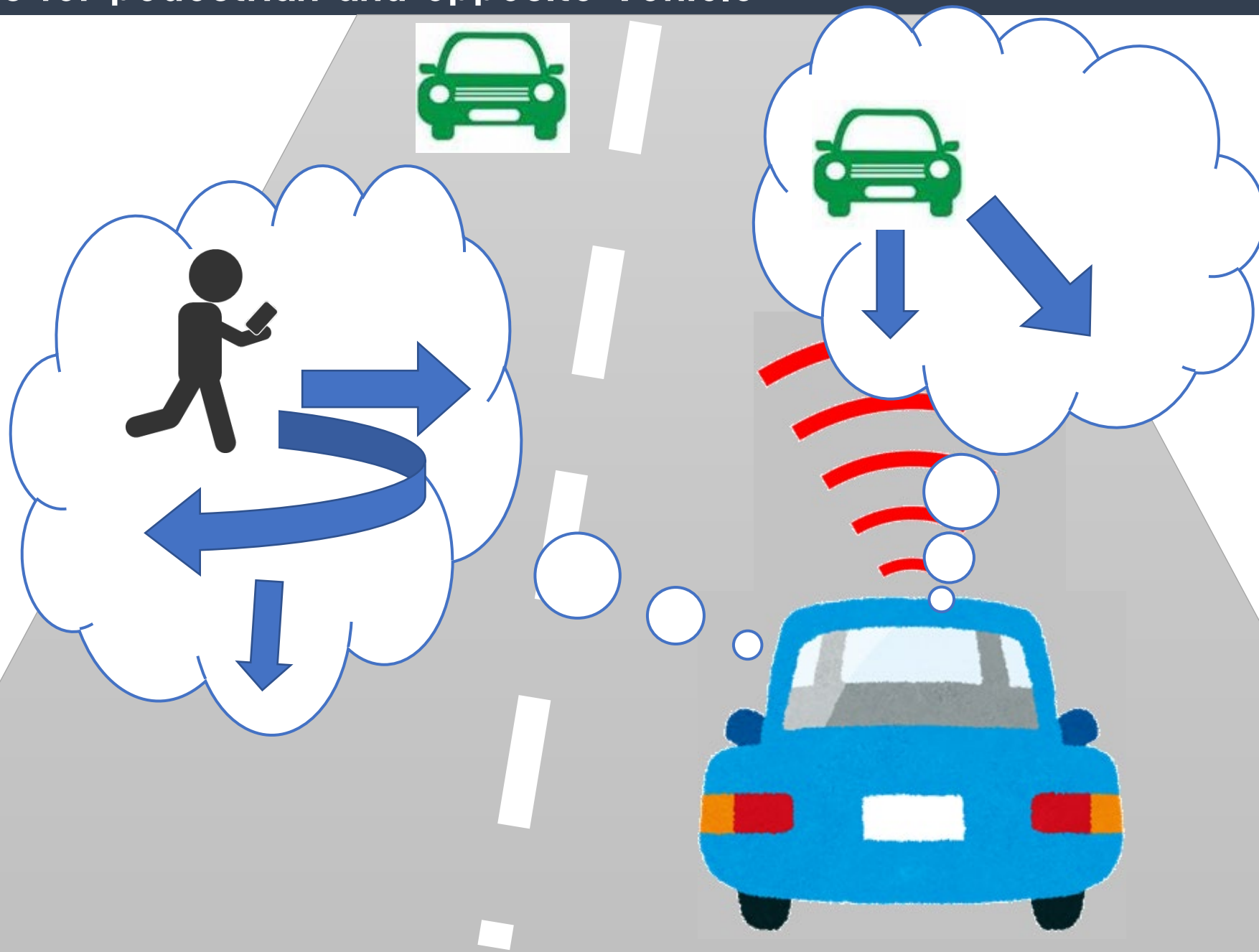
- RRI approach is important in the development of innovative technology. This will ensure that relevant scientific, technical, societal, and legal challenges are raised and addressed in a timely manner
    - that the risk of adverse, undesirable outcomes is minimised;
    - that the expected gains of the technology are realised for society as a whole
- \*"Ethics of Connected and Automated Vehicles" by the European Commission (2020)

## RSA, "Responsible Social Acceptance"

- It is also necessary to do some efforts by society to make it easier to increase social acceptance. It is a responsibility of our society. RSA "Responsible Social Acceptance".
- By utilizing RRI and RSA, the expected gains of innovative technologies are realised for society more quickly.

**Thank you  
For your attention.**

# Predictions for pedestrian and opposite Vehicle



# Common Avoidance Principle

