

TORIUMI LAB.

Design of Road Functions for Safety and Comfort



Department of Human and Social Systems
Harmonic Mobility Research Center, Urban Surface Streets for Smart Mobility

Road Functional Design

<http://www.transport.iis.u-tokyo.ac.jp>

DESIGNING SELF-EXPLAINING ROADS

for achieving safe and comfortable transport

Roads, including highways and streets, are shared by diverse users such as pedestrians, cyclists, private cars, buses, trucks, each traveling at different speeds with varying sizes, and differing desired directions. In certain situations, each user must restrict its movements to accommodate others. **Self-explaining roads guide their users to understand what to focus on and how to behave, through their geometric design and traffic operations.** This encourages spontaneous behavior that promotes the safety and comfort of everyone.

What to explain?

Road Network Planning Theory

To meet the diverse needs of users, it is important to prioritize different road functions for each road and balance them across a network. We study how to determine road functions.

Type	Traffic functions for Automobiles	Priority	Space Separation/Channeling
A ₁	Full access control for both directions and for both lanes	Highway	Grade separation
A ₂	Partial access control for both directions and for both lanes	Highway	Grade separation
C ₁	Partial access control for both directions and for both lanes	Highway	Grade separation
C ₂	Partial access control for both directions and for both lanes	Highway	Grade separation
D ₁	Partial access control for both directions and for both lanes	Highway	Grade separation
D ₂	Partial access control for both directions and for both lanes	Highway	Grade separation
E ₁	Partial access control for both directions and for both lanes	Highway	Grade separation
E ₂	Partial access control for both directions and for both lanes	Highway	Grade separation
F ₁	Partial access control for both directions and for both lanes	Highway	Grade separation
F ₂	Partial access control for both directions and for both lanes	Highway	Grade separation

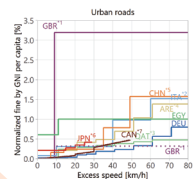
Trade-off between different functions $\rightarrow$ and different users $\rightarrow$



Where to explain?

Traffic Safety Culture

People's behavior is influenced not only by road design and operation but also by factors such as legislation, enforcement, driving license system, traffic education, history, economy, culture and climate. We aim to understanding this concept of "traffic safety culture".



Speeding fine comparison in nine countries

How to explain?

User Behavior Analysis for Road Design and Operation

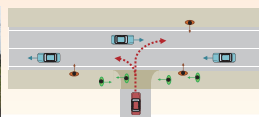
By understanding how road geometric design and traffic operation influence on people's driving and walking behavior, we propose designs that encourage safer practice.



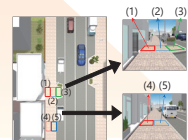
Hierarchical street planning for pedestrians and cars



Field experiment of "bulb-out" at midblock crosswalk



Interaction between land-access and pedestrians



Selection of pedestrian pausing space

