

Project Period : FY2013~FY2021

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# Mobility Innovation Center

Empowering an aging society through advanced mobility



Project Leader

Shigeru Kuroyanagi

Project General Manager  
Frontier Research Planning Dept.,  
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Toyota Motor Corporation

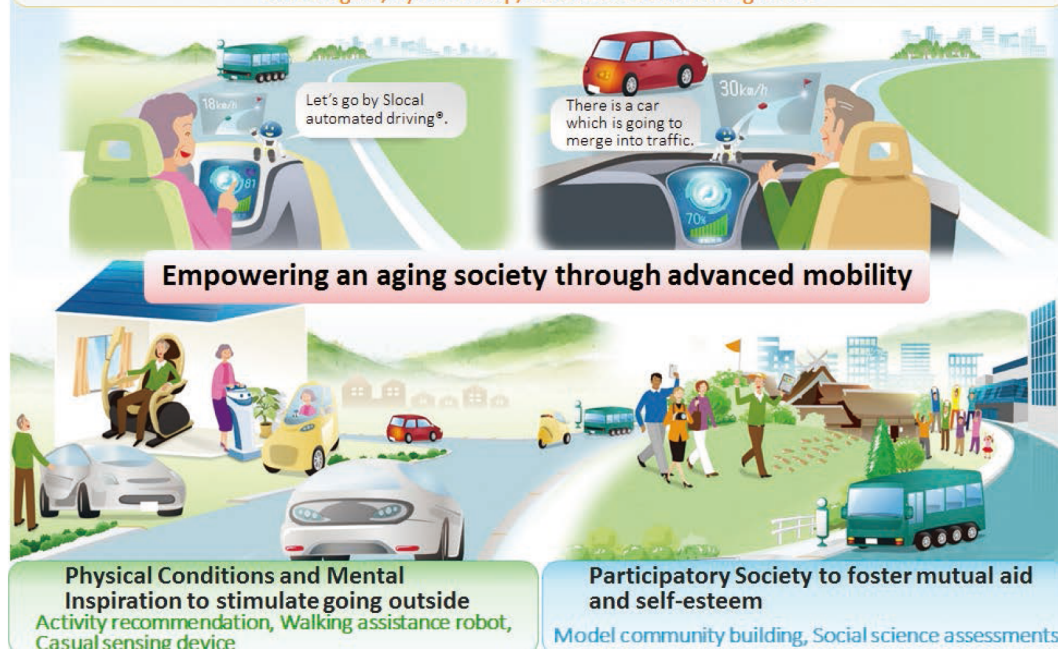
Research Leader

Takayuki Morikawa

Professor  
Nagoya University

## The Future

### Driving Assistance System and Autonomous Cars for safe and reliable mobility

Proactive driving assistance, Slocal (slow and local) automated driving®,  
Driver agent, Dynamic map, Stress-free Traffic management

## Outline

In an aging society, we want to create a world in which everyone, regardless of where they live or who they are, can play a meaningful role in their communities throughout their entire lives. We're getting there by empowering an aging society through advanced mobility. Our work allows senior citizens to stay actively mobile whenever and wherever they like, helping more of them to participate in the community and enhancing subjective measures of well-being.

## Application & Service

- Provide an enjoyable mobility experience even for those who cannot or do not like to drive  
Proactive driving assistance, Slocal (slow and local) automated driving®, Driver agent, Dynamic map, Stress-free Traffic management
- Use the personal information gathered through casual sensing to maintain physical and mental health  
Activity recommendation, Walking assistance robot, Casual sensing device
- Participatory Society to foster mutual aid and self-esteem  
Model community building, Social science assessments



## Implementation Structure

Project Leader : Shigeru Kuroyanagi (Toyota Motor Corporation)

Research Leader : Takayuki Morikawa (Nagoya University)

【Core institution】Nagoya University

【Participating institution】Tokyo University of Agriculture and Technology, University of Tokyo, Aichi Prefectural University, National Graduate Institute for Policy Studies, Tokyo Institute of Technology, Aichi Prefecture, Toyota City, Nagoya City, National Institute of Advanced Industrial Science and Technology, Asahi Glass Co., Ltd., Denso Corporation, Toyota Motor Corporation, Toyota Central R&D Labs., Inc., Panasonic Corporation, Fujitsu Limited

■ Satellite institution

Tokyo University of Agriculture and Technology, University of Tokyo

## Core Project

### Mobility Research

Mobility research is steadily making advances in the fields of human-centered cutting-edge technologies and social acceptance. We are engaged in research, development, and public road testing in (1) environmental recognition, (2) a Supervisory Driver Assistance System based on Proactive Driving (predicting vehicle position, proactive planning, evaluation systems that detect hidden risks, supervisory driver modeling, and agent systems), (3) human characteristics research based on a senior database. Finally, we are making use of our progress in all of these areas to propose and do real-world testing {Slocal (slow and local) automated driving®, etc.} on next-generation traffic systems.

### Information Platform Research

We are developing the building blocks for sophisticated monitoring technologies that use signaling data collected from the daily activity patterns of individuals and their surroundings, as well as for utilizing activity signaling data in the community while protecting privacy. These basic information technologies support the creation of added value by addressing mobility not only in terms of movement through space, but also in terms of the movement of information.

### Daily Healthcare Platform Research

We have developed a substance called intellectual glass, which uses high-speed, high-precision filtering of bodily components. The ability to detect cancer, stress, fatigue, and other conditions outside of medical settings will broaden horizons not only in mobility but in a variety of medical service industries as well.

### Sustainable Platform Research

We are putting together databases that use casual sensing technologies to gain lifestyle information and more. This department also develops intelligent agents (such as walking assistance robots) that link systems and people together as well as exercise programs that combat the limitations of aging. By combining these advances, we aim to create attentive support systems that give individuals their daily health status and other information.

### Cooperative Research

We are using dynamic maps, real-world evaluations of senior support technologies, and our model community project research to (1) create a database that can be used with information services that lower driving stress and help prevent traffic accidents, (2) analyze the impact of human-inspiring technology (HIT) R&D and mobility technologies on senior happiness, and (3) verifying the degree to which a strategic package of enhanced mobility, health monitoring, and outside activity inducements is effective at improving seniors' quality of life in a rural model community.

## Topics

### Environment Recognition

While maintaining a world-class level of pedestrian detection performance, we've proposed an algorithm capable of recognizing five extra pedestrian attributes, including body orientation. We have also created a system that detects distracted pedestrians who are walking while using their smartphones.



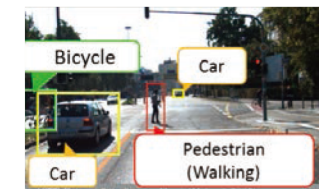
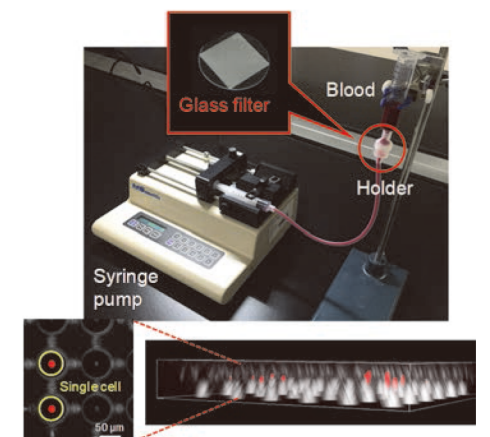
### Implement the control model into the driving simulator

We have installed the Supervisory Driver Assistance System and Agent System in the driving simulator to create a prototype. It also has been found that experiencing the driver assistance system results in improved driving skills.



### Bioaerosol Measurement Device

Device prototyping with intellectual glass enabled single-cell measurement.



Environment Recognition



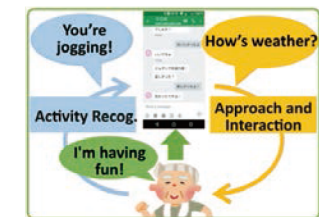
Supervisory Driver Assistance System based on Proactive Driving



Database of Senior Drivers



Next-generation traffic systems



Watch Over , Activity recommendation



Slocal(slow and local) automated driving®



Walking assistance robot

## Inquiry

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