

Automated Driving Services in Rural Areas

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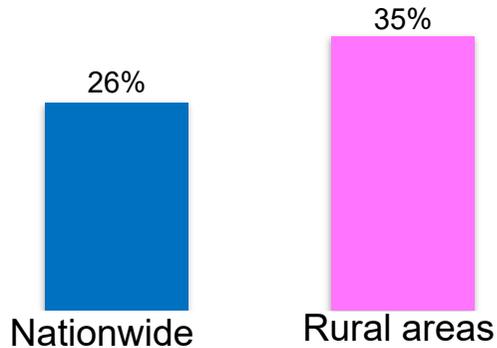
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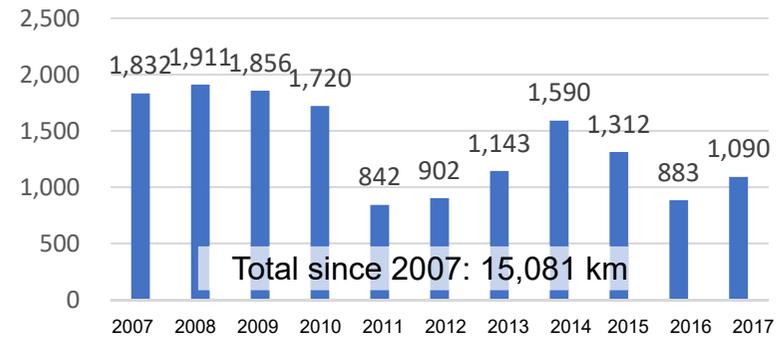
- 1. Challenges facing rural areas**
- 2. FOTs of automated driving services in rural areas**
- 3. Deployment of automated driving services
in rural areas**

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Comparison of aged population (2015)

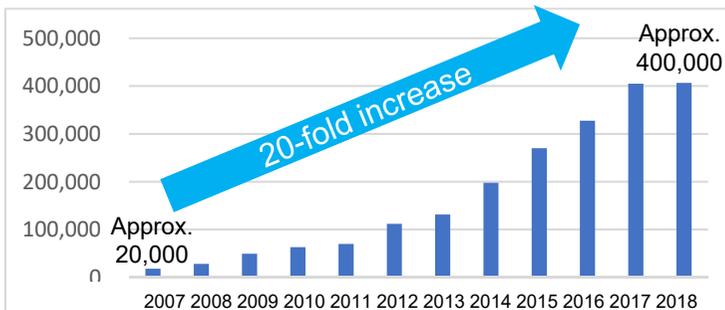


Total length of discontinued regular bus routes

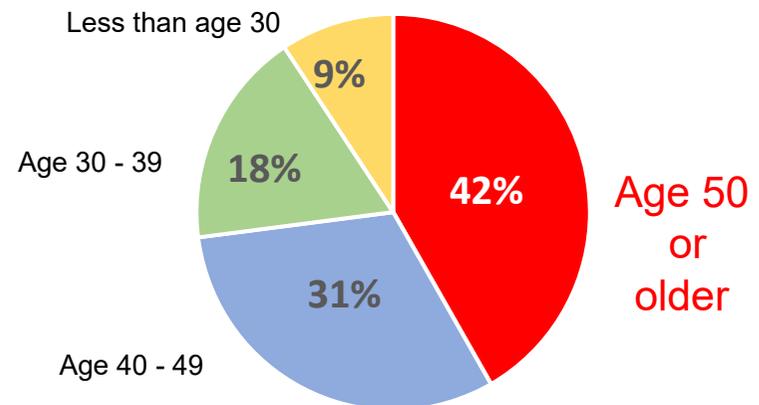


Rapid increase in senior citizens who cannot drive

Number of drivers (age 65 or over) who have voluntarily surrendered their driver's license



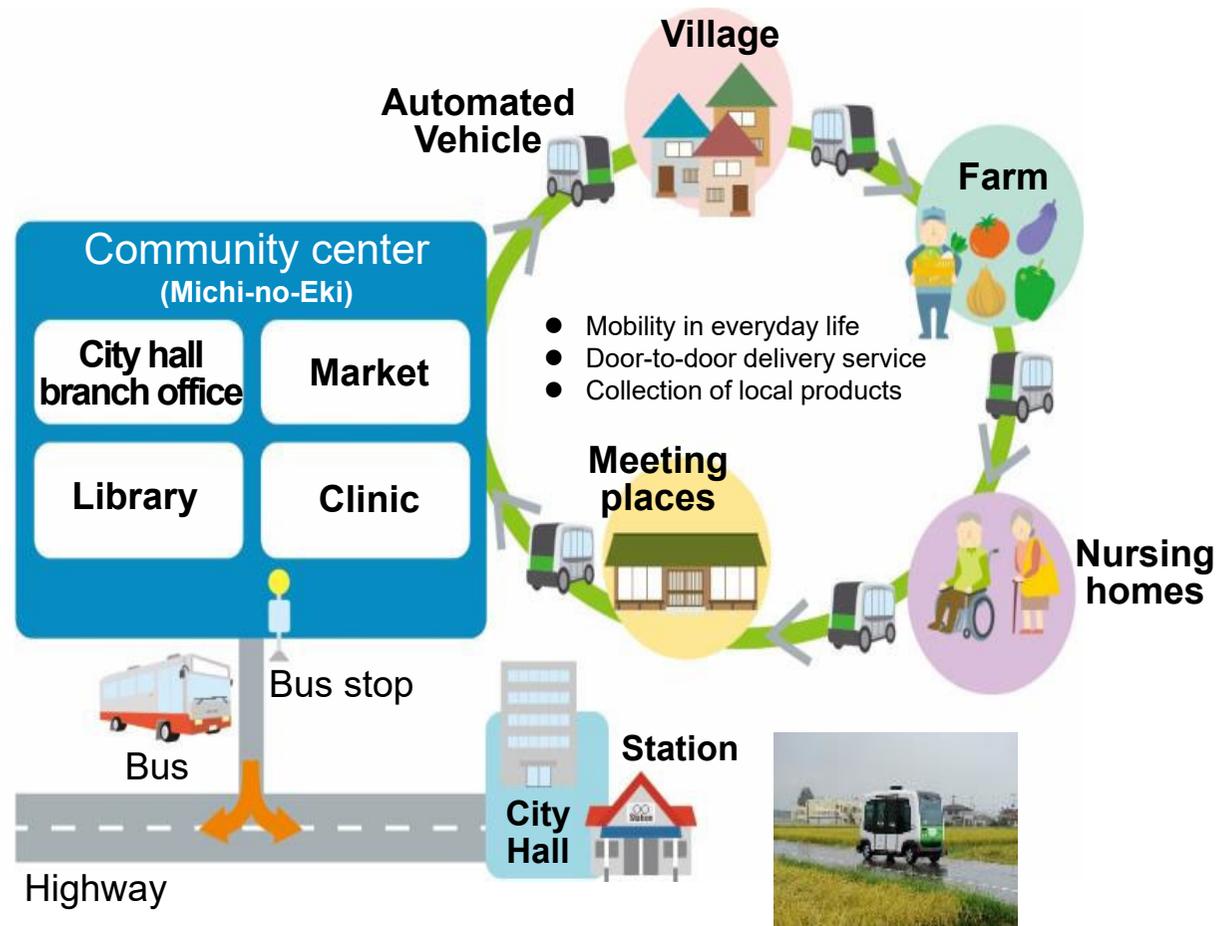
Lack of home deliveries due to truck driver shortage



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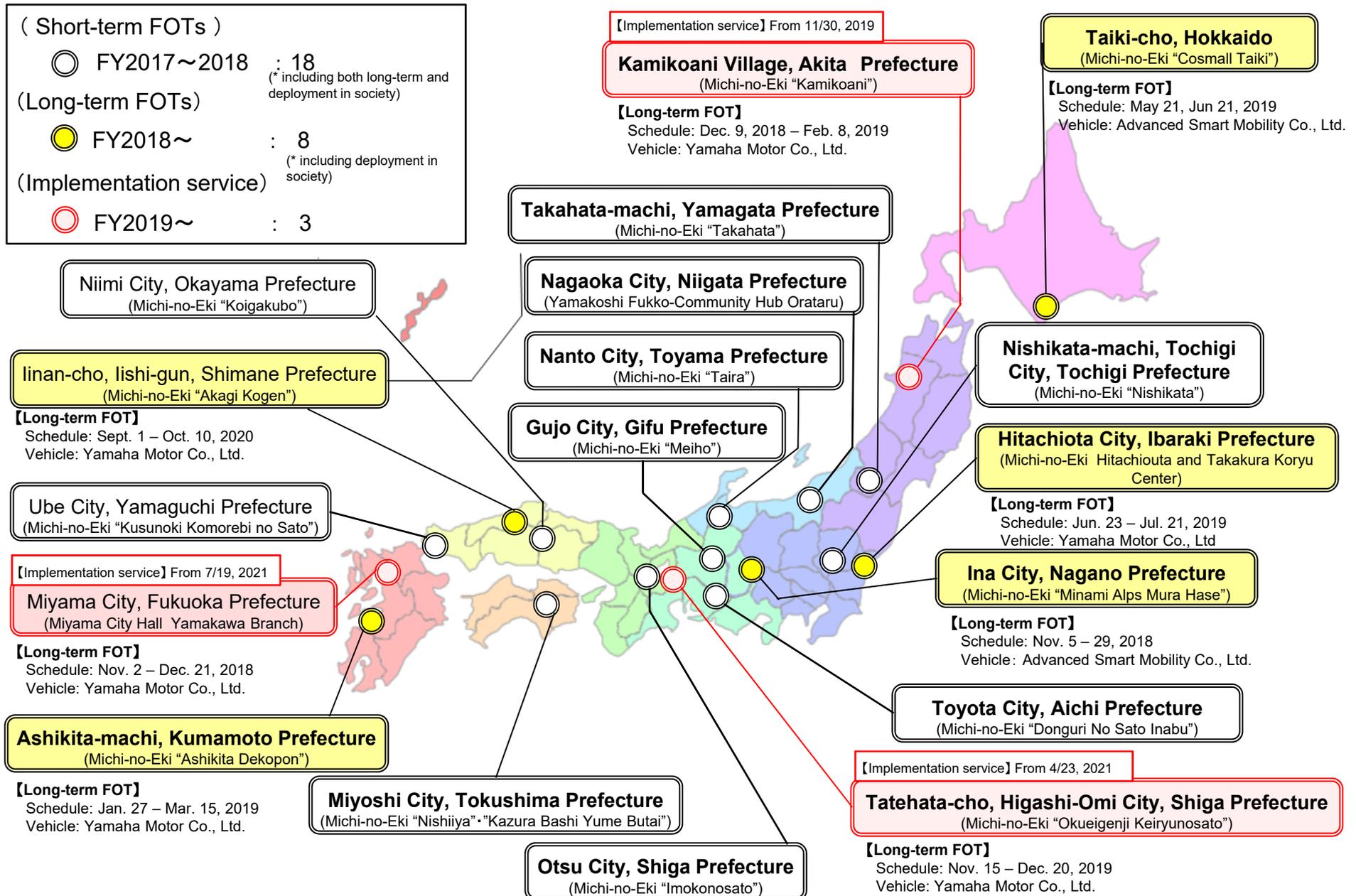
FOTs of automated driving services in rural areas

○ Expected to support transport of both people and goods, and further local revitalization.
○ A series of FOTs of automated driving services based at Michi-no-Eki have been started since 2017.



AV : Automated driving Vehicle

FOTs have been implemented in rural areas



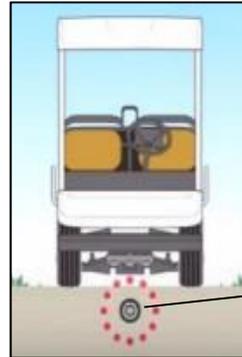
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Automated Vehicles

<Vehicle>



<Automated driving mechanism>



Electromagnetic induction lines

Electromagnetic induction lines are embedded in the road to guide vehicles

<Vehicle specifications>

- Developed by: Yamaha Motor Co., Ltd.
- Capacity: Max. 6 occupants
- Speed: Approx. 12km/h
- Driver: During operation, driver is on board but only monitors operation and does not steer or otherwise operate the vehicle

Operating system (Kamikoani)

Operating entity	Kamikoani Mobility Service Association (NPO)
Service	Pickup and drop-off of senior citizens
Fare	JPY 200 / trip
Operating distance	Total distance approx. 8km (round trip)
Schedule	Operating day: Everyday Regular service: AM: 1 trip (Mon. to Fri.) (On-demand service: Periods between regular service and on Saturdays and Sundays)

Operating system (Okueigenji)

Operating entity	Higashi-Omi City
Service	Pickup and drop-off of senior citizens and tourists Delivery of agricultural products, etc.
Fare	JPY 150 / trip (passenger) 100 / trip (products)
Operating distance	Total distance approx. 4.4km (round trip)
Schedule	Operating day: 4 days (Wed., Fri., Sat., and Sun.) Regular service: 6 trips (AM:2 trips, PM:4)

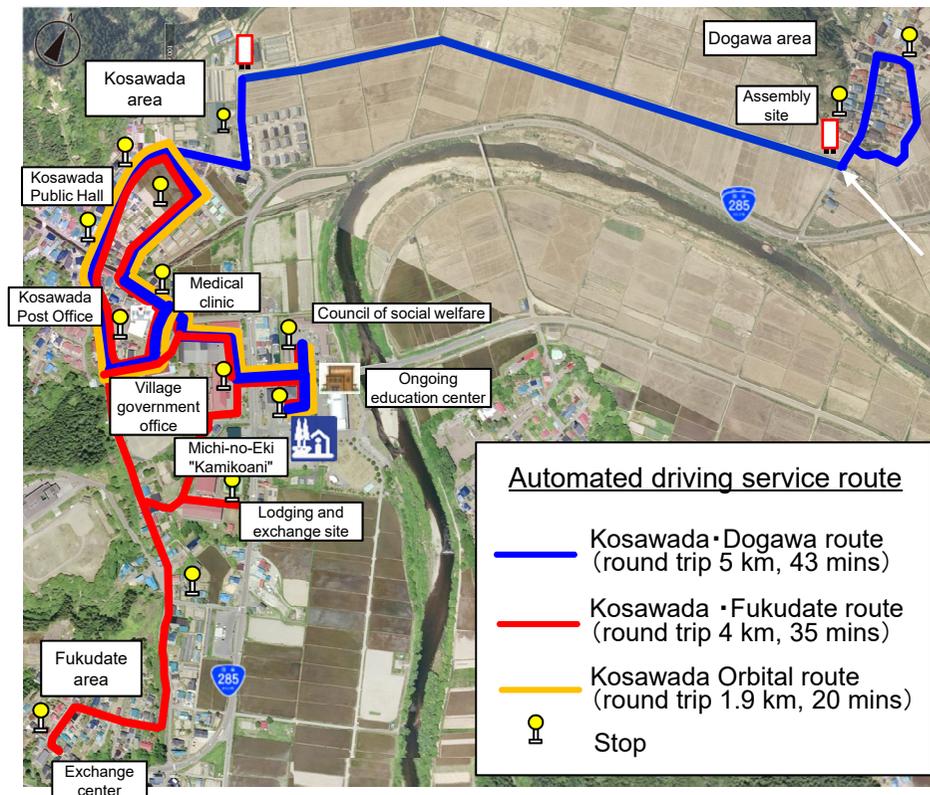
Operating system (Miyama)

Operating entity	Miyama City
Service	Pickup and drop-off of senior citizens
Fare	JPY 100 / trip
Operating distance	Total distance approx. 7.2km (round trip)
Schedule	Operating day: Mon. to Fri. Regular service: 5 trips (AM:3, PM:2)

Deployment of automated driving services based at Michi-no-Eki "Kamikoani"

- Total distance approx. 4 km based at Michi-no-Eki "Kamikoani".
- From November 30, 2019 to January 18, 2021, to ensure safe and smooth automated driving, a dedicated driving space was created to prevent ordinary vehicles from entering the sector.

Routes



Pictures



▲ Driving on snowy roads

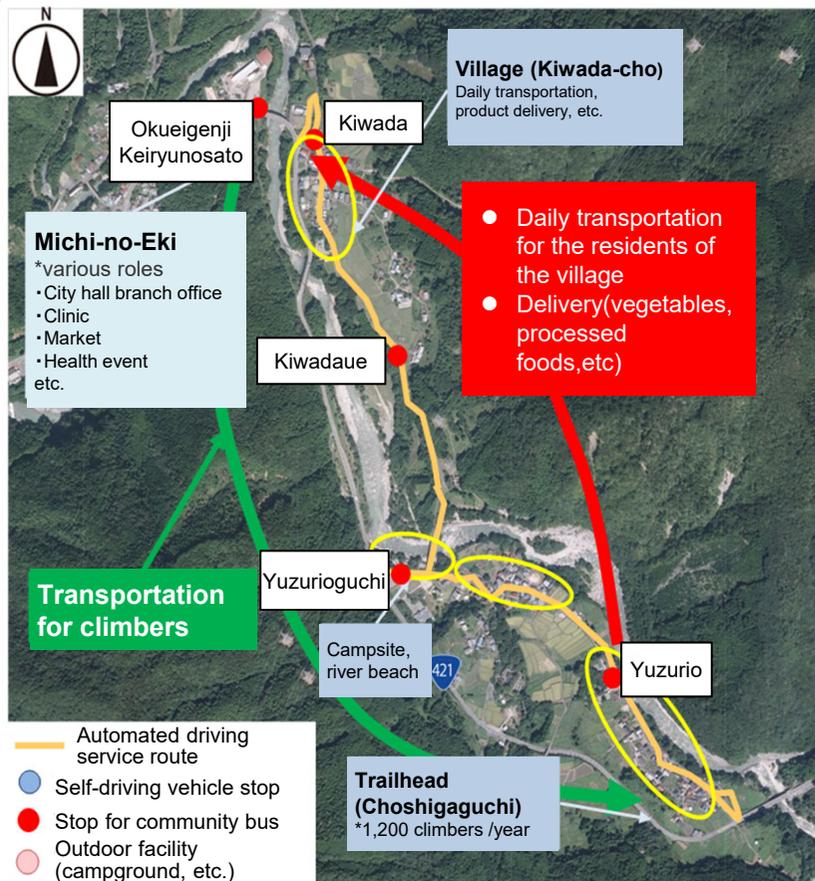


▲ Driving on dedicated space

Deployment of automated driving services based at Michi-no-Eki “Okueigenji Keiryunosato”

- Total distance approx. 4.4km based at Michi-no-Eki "Okueigenji Keiryunosato ".
- Installation of signboards and road markings on the route and dissemination with the cooperation of the local community for the smooth running of automated driving vehicles.

Routes



Pictures



▲ Automated driving

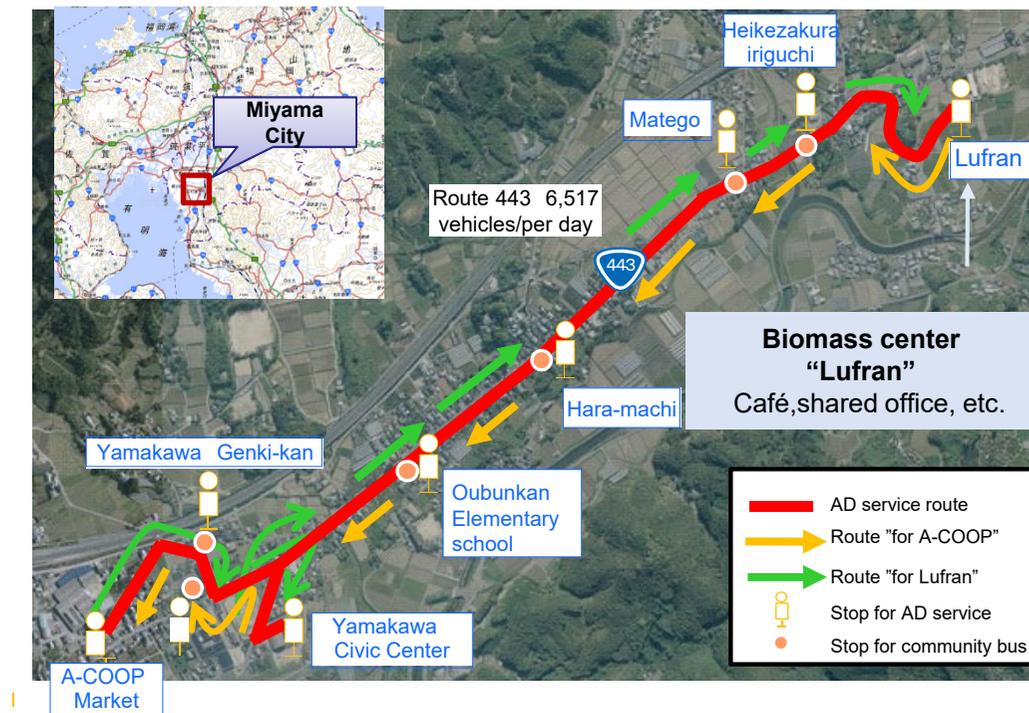


▲ Loading of farm products

Deployment of automated driving services based at “Miyama City Hall Yamakawa Branch”

- Total distance approx. 7.2km based at "Miyama City Hall Yamakawa Branch ".
- Secure regional transportation in sections where the service level of community buses is low. Automated driving service route is connecting the living and shopping bases of local residents with the biomass center "Lufran" promoted by Miyama City as a regional base.

Routes



Pictures



▲ Automated driving



▲ Riding

■ New route to meet local needs



▲ Extended the existing route to the village's sole convenience store to boost citizen's convenience.

■ Cooperation with community



▲ Local people gave nickname and created original sticker.

■ Cooperation with others



▲ Tie-up with Michi-no-Eki (Free ticket for purchase of JPY 1,000)



▲ Tie-up with village market : transportation of goods

“Kamikoani”

■ Verification of dedicated space (L=1km)

- Operated without accident for over a year
- No opinion such as anxiety about not having a driver
- Excessive dedicated space management costs for traffic guides, etc.



Confirmed stable driving without a driver.
There are almost no users who feel uneasy.



Traffic control by traffic guides is essential for the operation of the dedicated space.

■ Study of vehicle and infrastructure maintenance

- Organize the operation method by the local alone
- Verify infrastructure and vehicle maintenance and repair work



Equipment management for operation by volunteers only



Testing device for disconnection point



Organize procedures by recording infrastructure repair work