

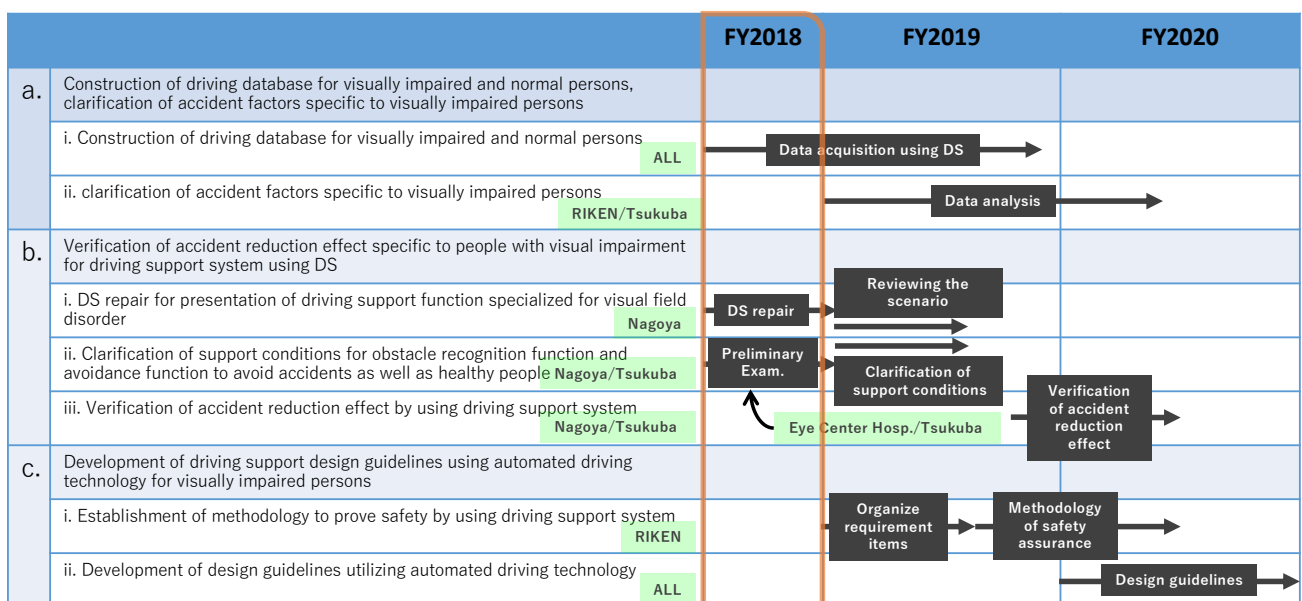
「Strategic Innovation Promotion Program (SIP) Phase Two / Automated Driving (Expansion of Systems and Services) Visual Field Defects

~FY2018-FY2020_FY2018 Annual Report~

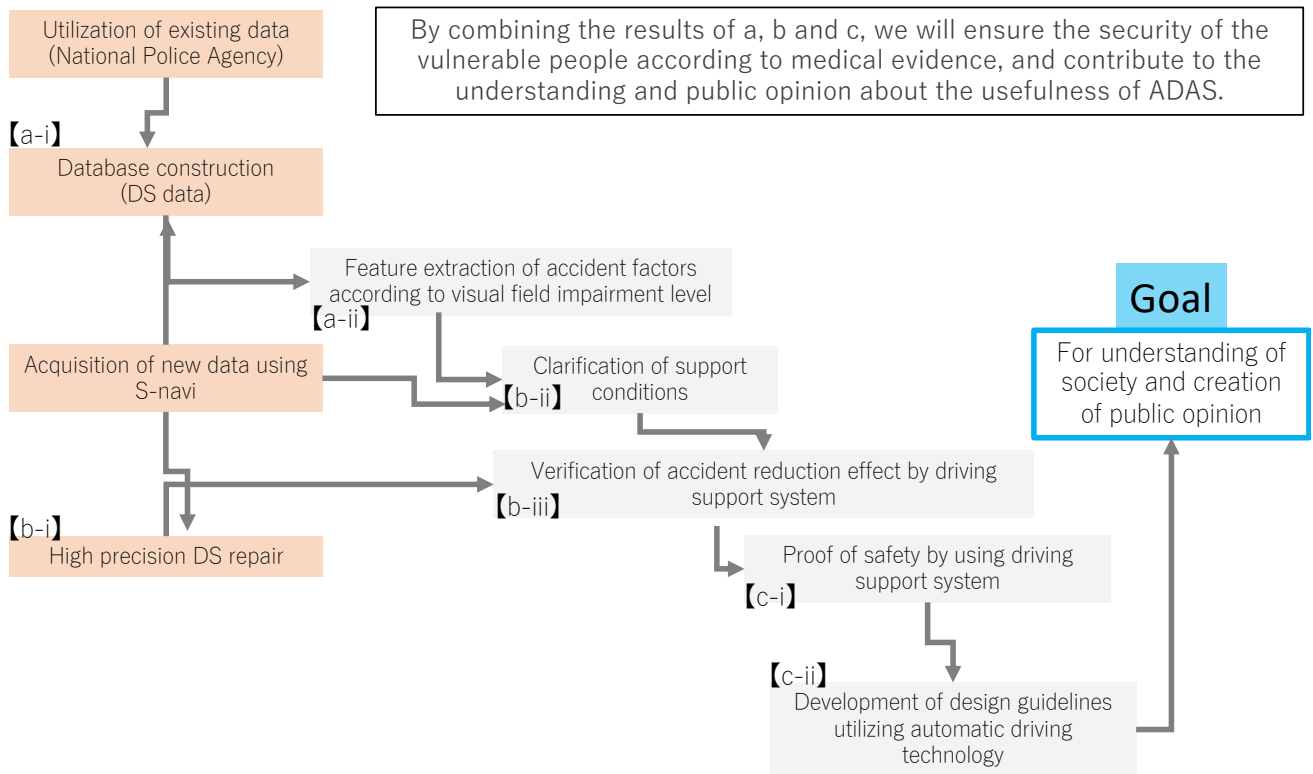
Summary

RIKEN
Nagoya university
Tsukuba university

▷ Research agenda of FY2018(□) in the overall plan



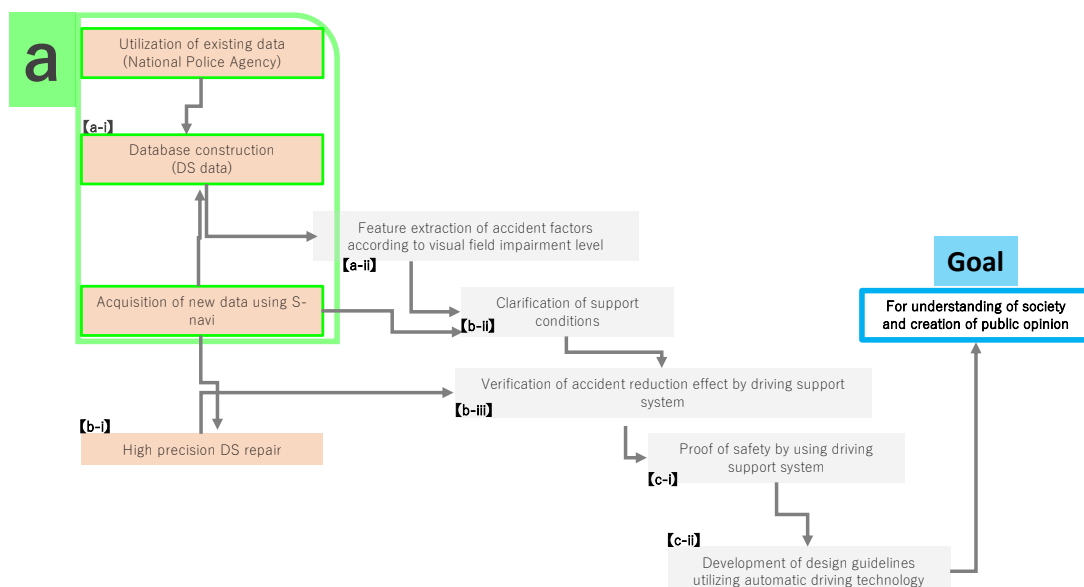
▷ Conduct contents and whole image of this year (FY2018)



▷ Progress on issue a.

From overall plan

		FY2018	FY2019	FY2020
a.	Construction of driving database for visually impaired and normal persons, clarification of accident factors specific to visually impaired persons			
	i. Construction of driving database for visually impaired and normal persons	ALL	Data acquisition using DS	
	ii. clarification of accident factors specific to visually impaired persons	RIKEN/Tsukuba	Data analysis	



▷ Items to be implemented in FY 2018 in issue a.

【Purpose】

We will verify the frequency of accidents specific to people with vision impairment using DS (Honda Safety Navi GE). Prepare to verify the degree of visual impairment and eye movement that are likely to cause an accident, and start the verification.

【Method】

- ▷ Utilization of existing data
 - Apply to the National Police Agency for utilization of existing research data (About 100 cases)
- ▷ Acquisition of new data
 - Complete IRB procedures for conducting research at medical institutions and obtain subject data
- ▷ Database construction
 - Prepare for database construction

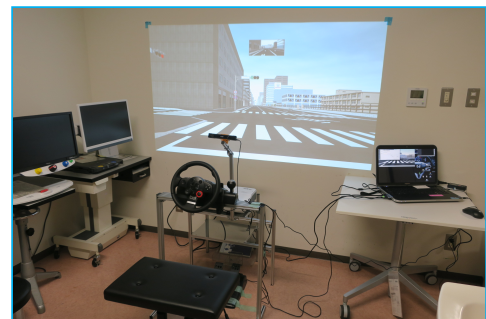


↑
Data analysis tools

▷ Results to be implemented in FY 2018 in issue a.

【Result】

- ▷ Utilization of existing data
 - Under preparation for application
- ▷ Acquisition of new data
 - Kobe Eye Center Hospital
 - Prepare: IRB procedure end
 - Results: 10 cases
 - Niigata university
 - Prepare: IRB procedure end
 - Results: 64 cases
 - Tohoku university
 - Prepare: IRB procedure end
 - Results: 9 cases
- ▷ Database construction
 - RIKEN
 - Prepare for database construction

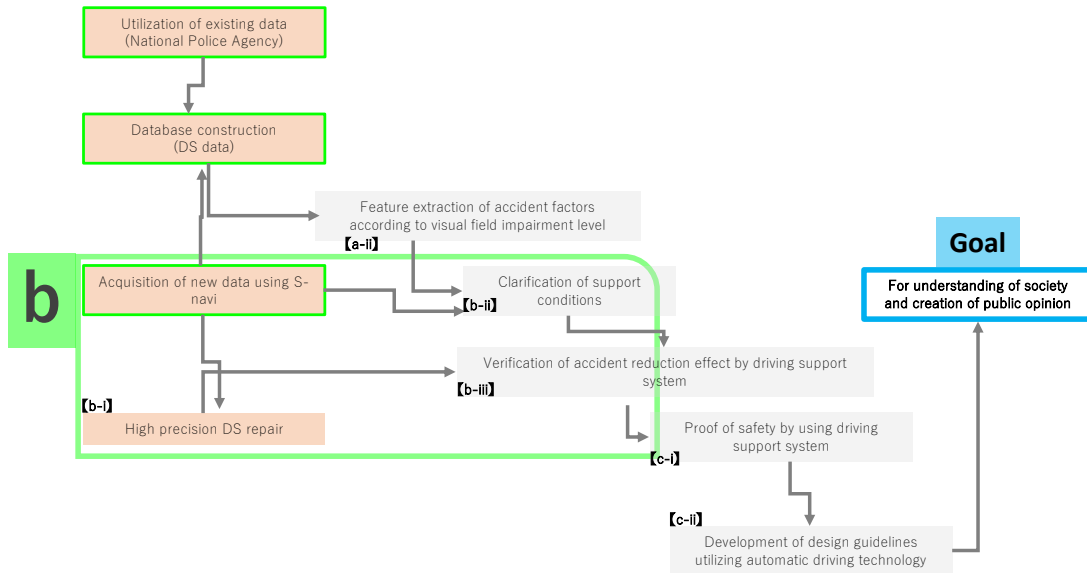


↑
Driving simulator
at Kobe Eye Center Hospital

▷ Progress on issue b.

From overall plan

	2018年度下期	2019年度	2020年度
b. Verification of accident reduction effect specific to people with visual impairment for driving support system using DS			
i. DS repair for presentation of driving support function specialized for visual field disorder Nagoya	DS repair	Reviewing the scenario	
ii. Clarification of support conditions for obstacle recognition function and avoidance function to avoid accidents as well as healthy people Nagoya/Tsukuba	Preliminary Exam.	Clarification of support conditions	
iii. Verification of accident reduction effect by using driving support system Nagoya/Tsukuba	Eye Center Hosp./Tsukuba	Verification of accident reduction effect	



▷ Items to be implemented in FY 2018 in issue b.

【Purpose】

- ① Preliminary examination of driving behavior in traffic environments prone to accidents specific to people with visual impairment.
- ② Preliminary examination of the effectiveness of providing support functions for obstacle recognition and avoidance for drivers with visual impairment.

【Method】

- ▷ Examination of the effectiveness of driving scene in high precision DS
 - Prepare driving scenes (scenarios) of NIC-DS in Nagoya University National Innovation Complex (NIC) and carry out preliminary experiments.
- ▷ High precision DS repair
 - We carry out repair about link with eye gaze measuring device.
 - Repair the software.
- ▷ Improvement of simplified type DS (S Navi)
 - Add conditions such as voice guidance and automatic braking for developed scenarios.
 - Check the usability of the installed system and extract issues.



▷ Results to be implemented in FY 2018 in issue b.

【Results】

▷ Examination of the effectiveness of driving scene in high precision DS

The utility scenario of the driving scenario was conducted through data analysis of the existing research (total of 85 cases). The five extracted scenarios were created respectively.

▷ High precision DS repair

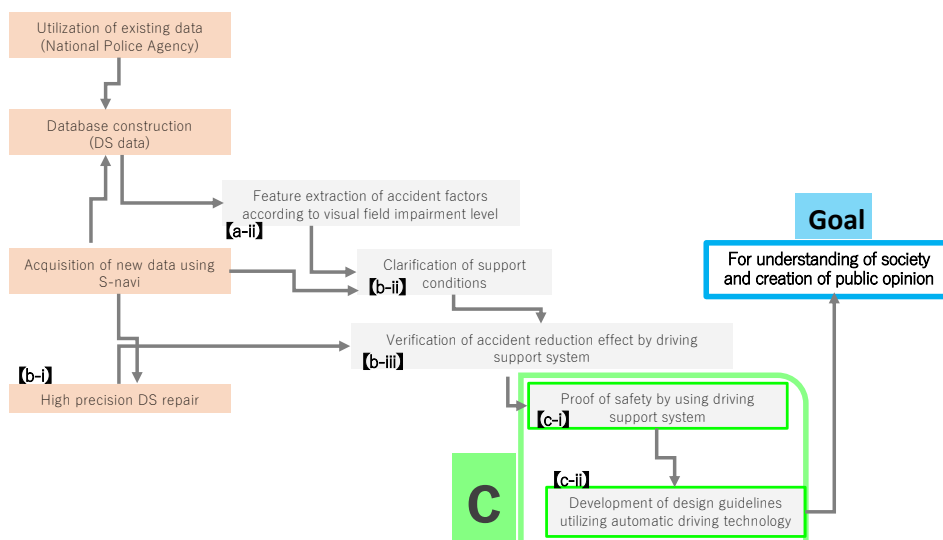
The plug-in has been improved to synchronize the measurement data of the non-contact line-of-sight measurement device (SmartEye) installed in the cockpit with the DS log. We also implemented a plug-in improvement that records the driver's viewpoint position. As a result, the relationship between gaze movement and the environment can be analyzed more accurately. As a result of the preliminary experiment, some unnaturalness of movement etc. were found and we will solve the problem.

▷ Improvement of simplified type DS (S-Navi)

A voice guide and an automatic brake program were installed on the simplified DS. It was confirmed that automatic braking is at a level that can be generally implemented although adjustments such as timing are necessary. On the other hand, since various problems were occasionally found in the voice guide, it was decided to make improvements and verify again.

▷ Progress on issue c.

		From overall plan		
		2018年度下期	2019年度	2020年度
c.	Development of driving support design guidelines using automated driving technology for visually impaired persons			
	i. Establishment of methodology to prove safety by using driving support system	RIKEN	Organize requirement items	Methodology of safety assurance
	ii. Development of design guidelines utilizing automated driving technology	ALL		Design guidelines



▷ Items & Results to be implemented in FY 2018 in issue c.

【Purpose】

Start preparing for external collaboration and consultation on the goals and operation methods of this research.

【Method】

External collaboration destination

▷ Industry group: JAMA and JSAE

▷ Regulatory authority: National Police Agency and National research Institute of Police Science

▷ Medical institution: Hospital official and Medical association

▷ Academic society: JSRM

▷ Patient collaboration: Patient group (RP etc.)

▷ Another research group: some SIP-associated groups

【Results】

- We started preparing for information exchange and discussions (JAMA).
- Participated as a committee and made a foundation for information exchange (HMI).
- We started preparing for the place of the information dispatch that used the opportunity of the patient meeting and the citizen course.
- We started preparing for the Ophthalmology Society WG.