Japanese Activities on Approaching Vehicle Audible System for HEVs and EVs

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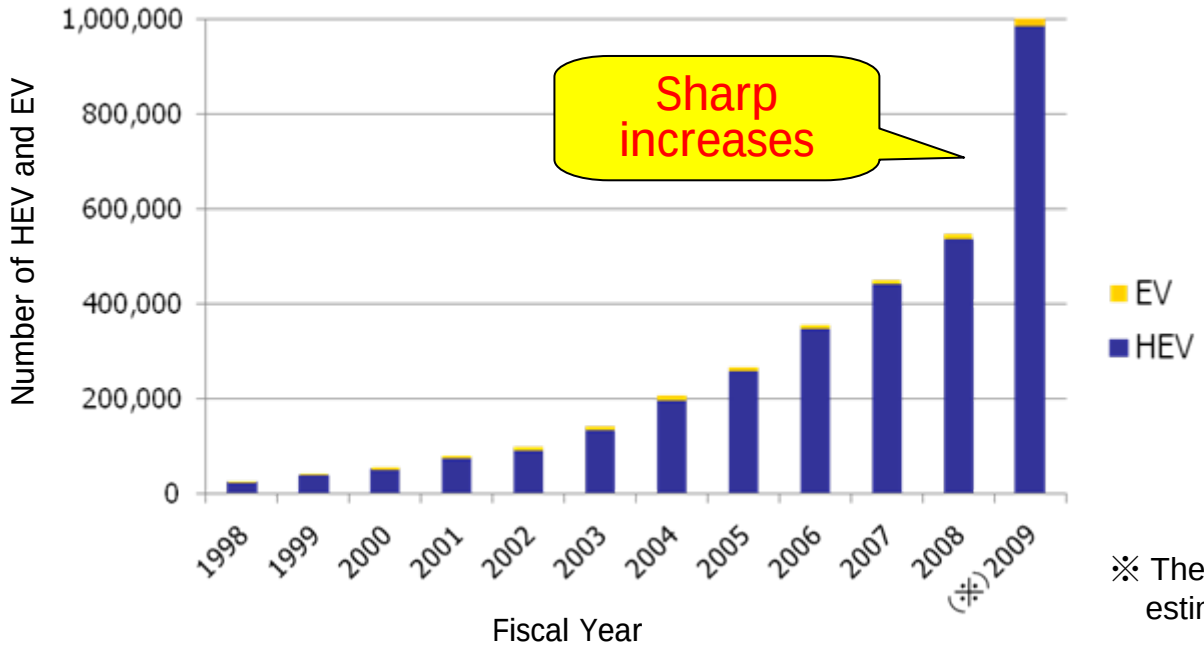
Background

- Number of Hybrid Electric Vehicles (HEVs) and Electric Vehicles (EVs) increasing in Japan



※ The number in fiscal year 2009 is an estimate value.

- Those vehicles are very quiet and difficult to be noticed by pedestrians

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- Background to the Study
- History of the Study in Japan
- Study Committee Members
- Main Points of the Study

History of the Study in Japan

- Around 2005: In response to vehicle users' comments ("Pedestrians don't notice our vehicles", etc.), each manufacturer started investigating the situation on its own.
- 2007: Investigation conducted by MLIT and JAMA of the following:

  * Current situation of EVs and pedestrians
  * Development of vehicles equipped with approach audible system
  * Testing on perception of EVs
  * Testing on acceptability of audible system-equipped vehicles
  * Evaluation by survey respondents of audible system-equipped test vehicles on public roads

- 2009: Study Committee meetings held at MLIT

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- Background to the Study
- History of the Study in Japan
- Study Committee Members
- Main Points of the Study

Study Committee Members (1)

- Names and Areas of Expertise

Researchers:

- Minoru Kamata (Director/Professor at Institute of Gerontology, the University of Tokyo)
- Toshiyuki Inagaki (Professor at Graduate School of Systems and Information Engineering, University of Tsukuba)
- Yasushi Nakano (Professor at Department of Economics, Keio University)
- Takeharu Tanaka (Research Coordinator at National Traffic Safety and Environment Laboratory)

Representatives of the visually-impaired:

- Yoshihiko Sasagawa (President, Japan Federation of the Blind)
- Fujiko Shimoyachi (Adviser, Japan Association of Consumer Affairs Specialists)

Study Committee Members (2)

- Names and Areas of Expertise

Representatives of the industry:

- Japan Automobile Manufacturers Association (JAMA)
- Japan Auto Parts Industries Association (JAPIA)
- Japan Automobile Importers Association (JAIA)
- Japan Automobile Federation (JAF)

Representatives of the government:

- Director (Traffic Safety Policy) under Director-General for Policy Planning (Convivial Society Policy) in the Cabinet Office
- Director, Traffic Planning Division, Traffic Bureau, National Police Agency
- Director, Engineering Planning Division, Engineering and Safety Department, Road Transport Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT)

CONTENTS

Points of the Study

- **Measure Against Quietness: Necessary or not?**

Points in question:

*** Do we need to add sound to vehicles that have been made quiet?**

*** We may not need any measure if drivers pay more attention to pedestrians.**

Discussions at the Study Committee meetings:

* Visually-impaired pedestrians audibly recognize the presence/behavior of vehicles.

* The vehicle sound plays an important role as a tool for communication between vehicles and pedestrians (especially visually-impaired pedestrians). Hence, the absence of this sound is a problem.

* With the diversity of drivers and human errors being considered, it is not realistic to expect drivers alone to do something about the situation.

Conclusion: We need an audible measure.

Points of the Study

➢ **Possibility of Non-Audible Measures**

Points in question:

*** How about building a system where vehicles and pedestrians can check each other's location using communication technology?**

Discussions at the Study Committee meetings:

* This measure can be effective in the future.

* Measures using communication technology are currently under development (with some unresolved issues). We therefore need to wait for the technological development to progress.

Conclusion: For now, we need an audible measure.

Points of the Study

- **Types of Sound Emitted by Vehicles**

Points in question:

* What kind of sound is appropriate for the measure?

Discussions at the Study Committee meetings:

* It needs to be easily noticeable even by the elderly.
* It needs to allow pedestrians to recognize the presence/behavior of vehicles naturally and easily even without prior knowledge.

Conclusion: The sound that reminds us of running vehicles

Points of the Study

➢ Method for Playing the Sound

Points in question:

*** Permanently on or manually switchable?**

*** If the sound is on permanently, is the stop switch necessary?**

Discussions at the Study Committee meetings:

* In the case of the manual method, the drivers must make sure that the sound is turned on when necessary, but it is useless if they are not aware of the presence of pedestrians.

* If the soft horn or other short single sounds are used, pedestrians cannot grasp the behavior of vehicles.

* When drivers want to stop the sound while driving in areas where the audible warning is not necessary (e.g., residential area with few pedestrians at night) but is unable to stop it, some of them may accelerate the vehicle or remove the system so that the sound would stop.

Conclusion: Basically, the sound will be kept on permanently. The temporary stop switch will be allowed, but the system must automatically resume the sound.

Points of the Study

- **How to Spread The Use of the System**

Points in question:

*** Should it be a mandatory measure?**

Discussions at the Study Committee meetings:

* The equipment needs to be mandatory to ensure its widespread use.

* However, mandatory equipment on in-use vehicles is difficult due to many technical and economic issues.

Conclusion: Mandatory on new vehicles.

The use will be promoted by allowing simplified systems for in-use vehicles.

Positioning of Guideline

Issue

Visually-impaired pedestrian are unaware of EV/HEV due to the quietness.

Rapid penetration of HEVs

Voluntary

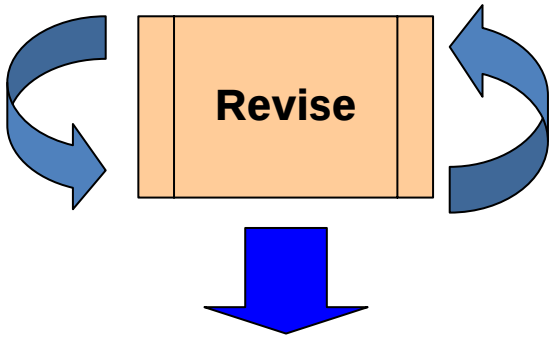
Guideline

Measures against the issue are needed ASAP.

Don’t disturb the promotion of the development for new technology.

Assessment

Penetration for measure systems in voluntary



- Assess social acceptability and status of developments on AVASs.
- Develop test method and requirements of sound volume.

Mandatory

Technical requirements

Result of the Public Comments

* Comments calling for the audible measure		61
* Comments against the audible measure		93
* Comments against the vehicle-only measure		54
* Comments urging the driver education		35
* Comments about the details of the measure		
	* About the scope	34
	* About situations where the measure is necessary	28
	* About the sound types and properties	167
	* About the method for playing sound	137
	* About the sound volume	28
	* About how to spread the use of the system	42
* Comments suggesting the measure be based on new technology, etc.		27
* Other comments		83

Committee Chairman's Comments

- Based on the results of the past studies, the Study Committee considered the safety and comfort of the visually-impaired pedestrians, etc. as the first priority when drawing up the conclusion.
- However, this problem is not just about the visually-impaired; almost everyone is involved either as pedestrians or drivers.
- This agreed measure does not solve everything. For ensuring safety, the role of drivers is essential.
- It is hoped that these discussions will promote people's awareness on the importance of traffic safety.

Thank you for your attention!