

# TRAFFIC SAFETY MEASURES BASED ON THE DEVELOPMENT AND OPERATION OF INFORMATION PROVISION SYSTEM USING HAIL DETECOR

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JAPAN

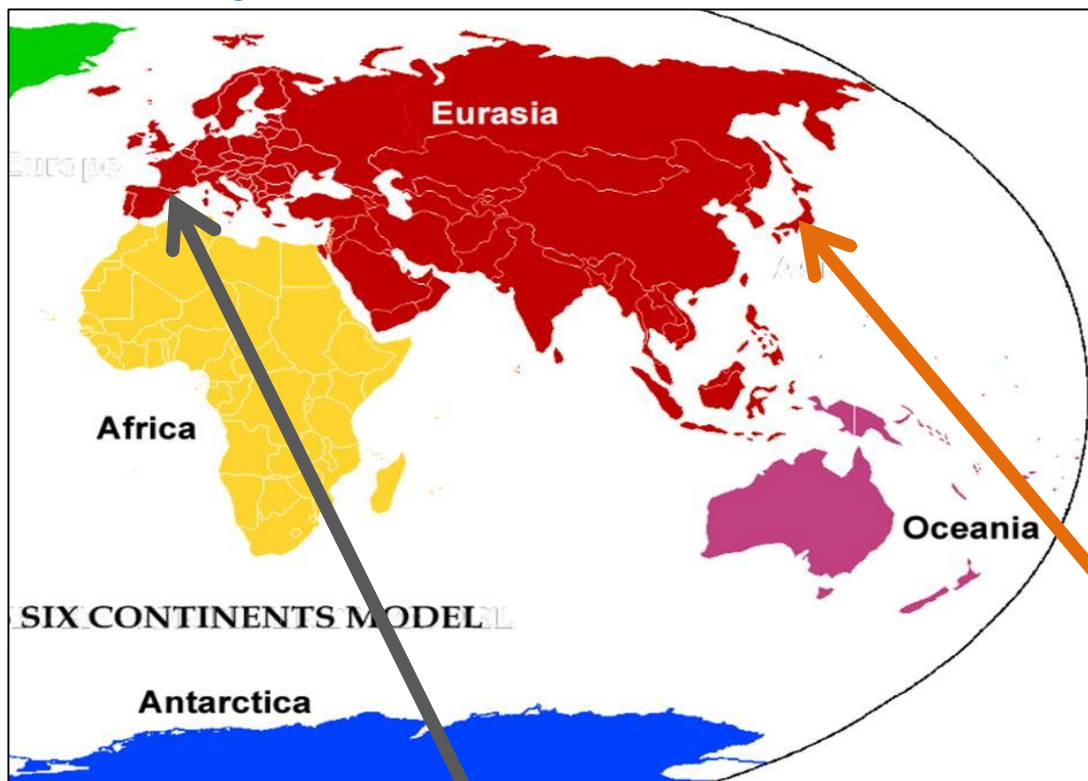
# CONTENTS

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1. Features of Niigata
2. Features of hail
3. Relation between the weather of winter and the traffic accident
4. Development of hail detector
5. Operation by Information Provision system
6. Conclusion

# 1. Features of Niigata

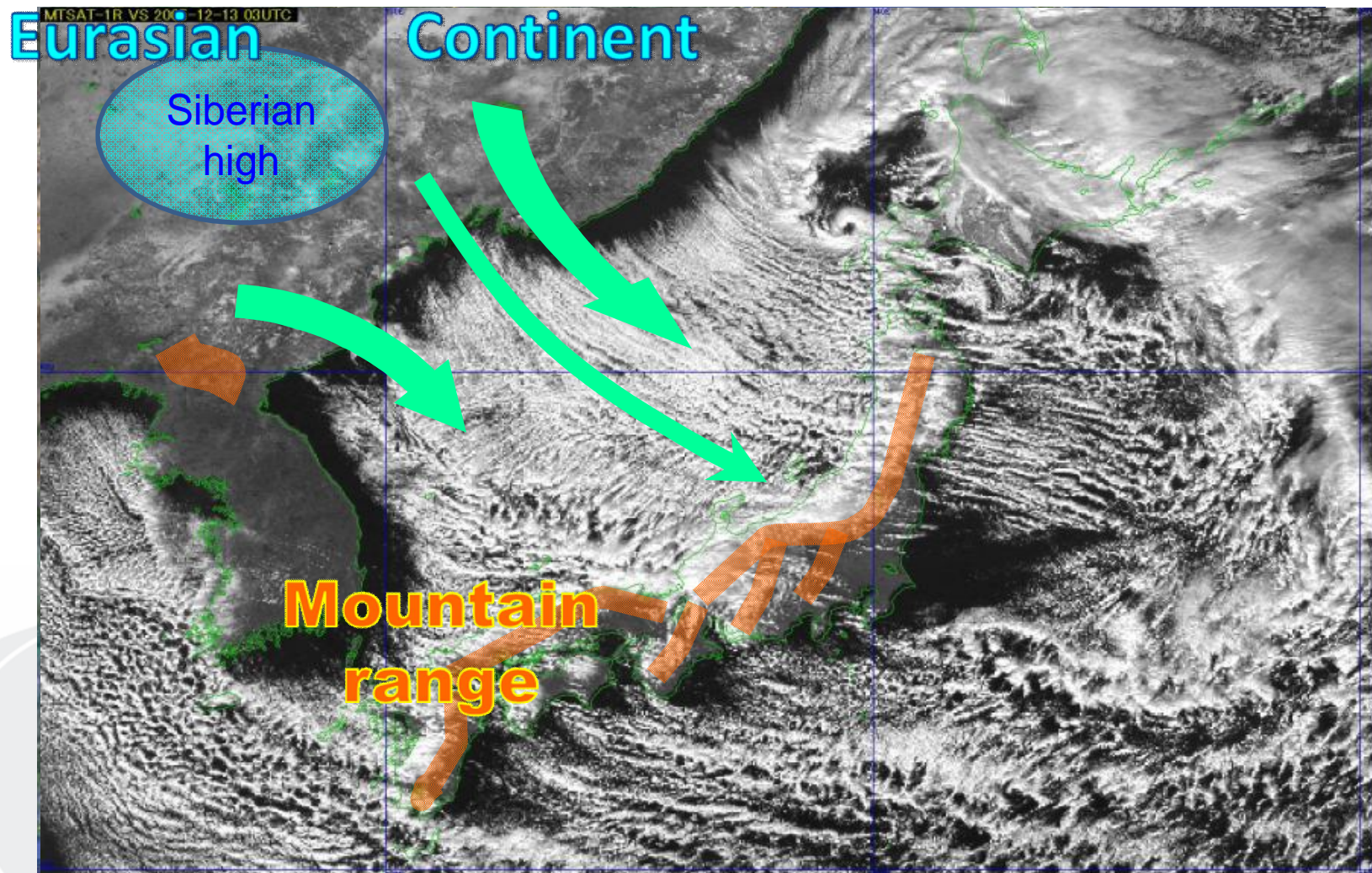
## Geographical locations



	Niigata, Japan
Latitude	N 37°08'53"
Longitude	E 138°14'10"

	Andorra la Vella, Andorra
Latitude	N 42°30'
Longitude	E 1°30'

# 1. Features of Niigata



## 2. Features of hail

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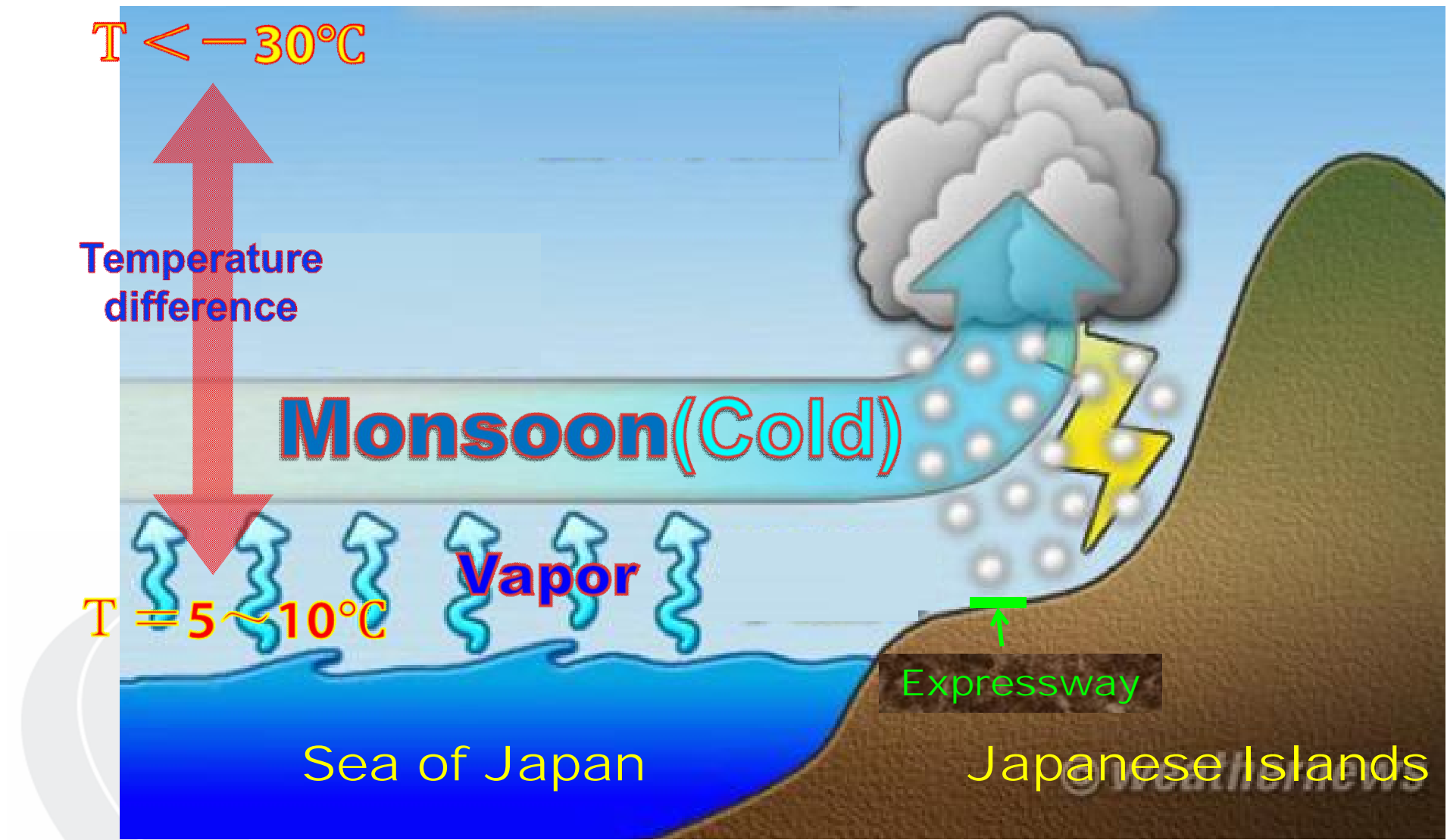
# What is hail?

- Small ice particle (<5mm)
- A form of solid precipitation



# How is hail generated?

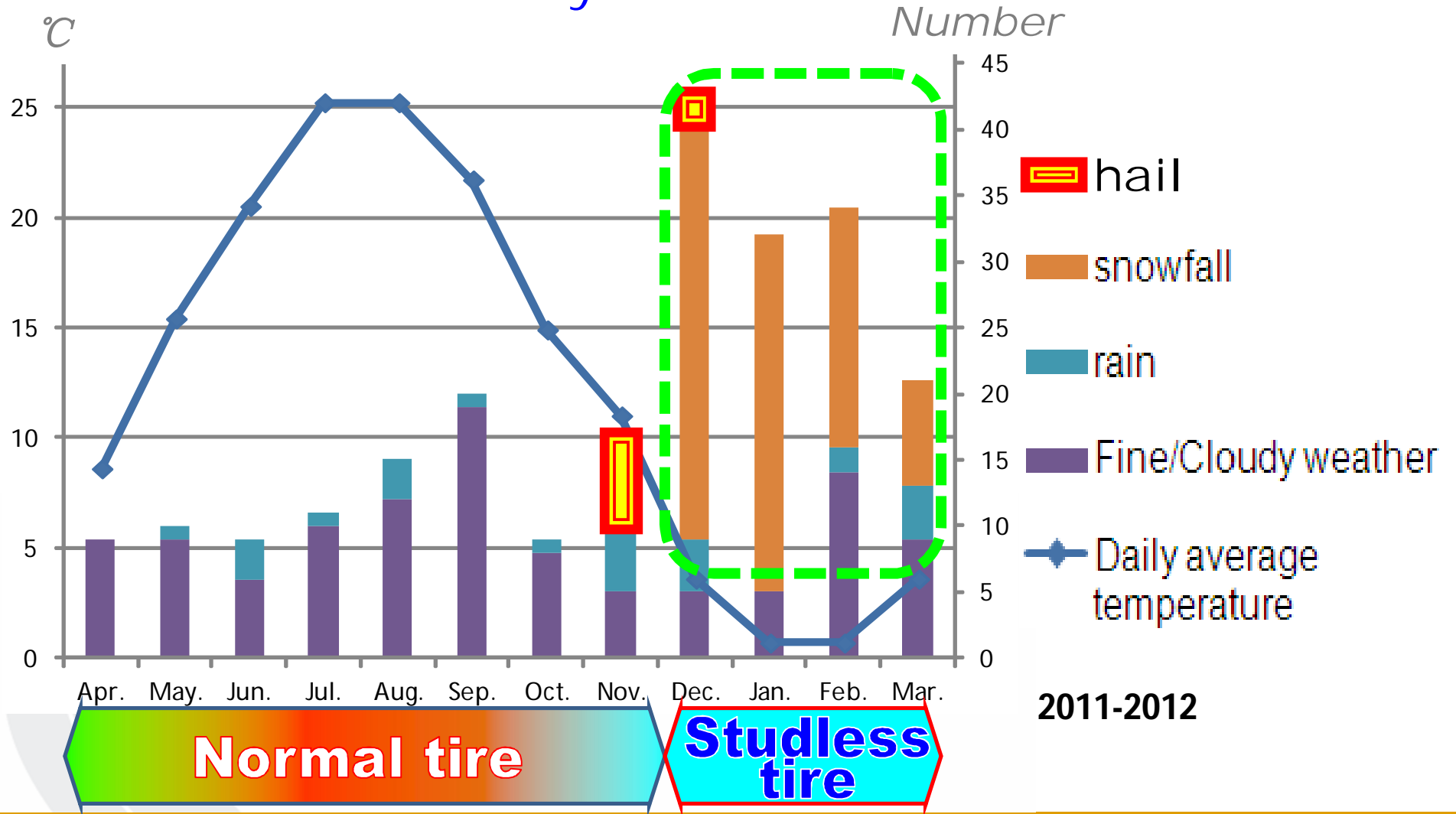
## 2. Features of hail





## 2. Features of hail

### Risk of accidents by "hail"





## 2. Features of hail

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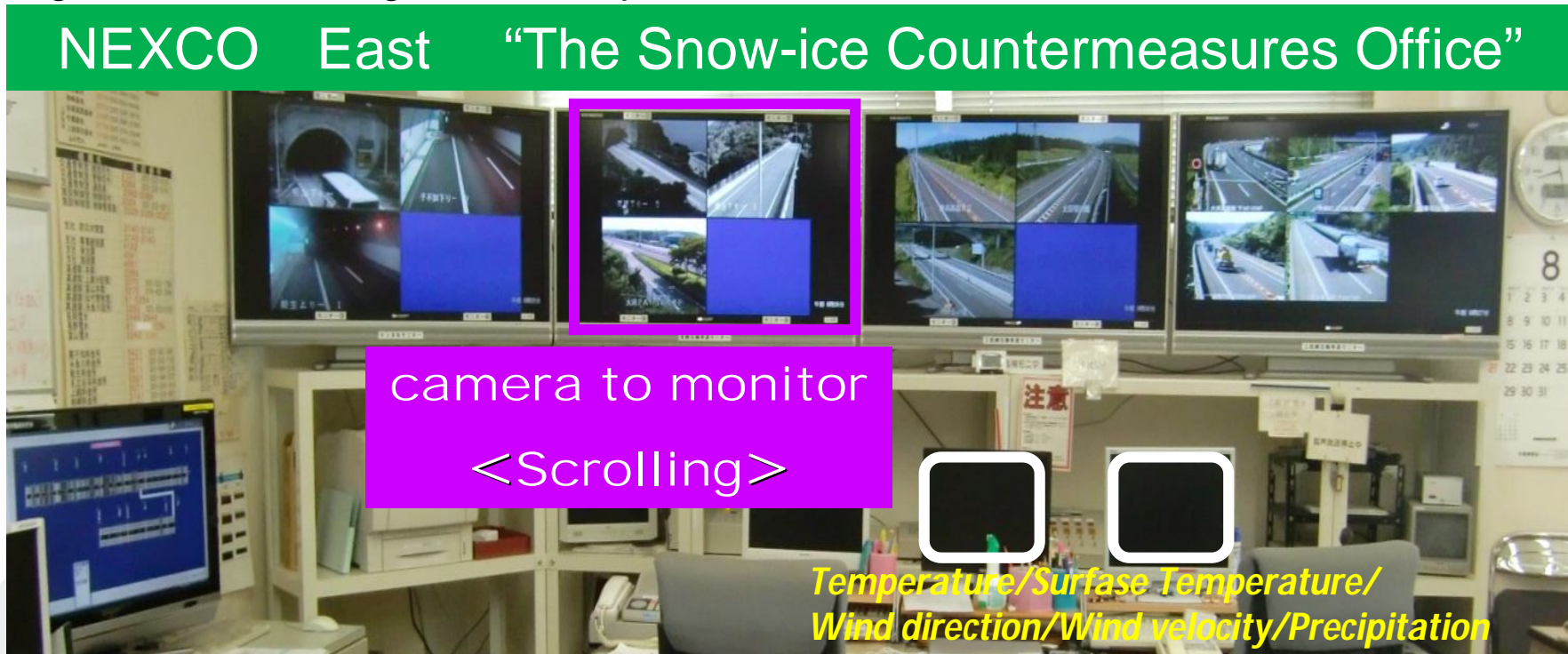
【 Road surface conditions 】

【 Road surface conditions 】  
Sherbet-like

9 minetes

## 2. Features of hail

The tunnel exit where the road surface changes suddenly from dry is very dangerous for drivers, and in order that an accident may occur easily, it is supervised with the cameras.

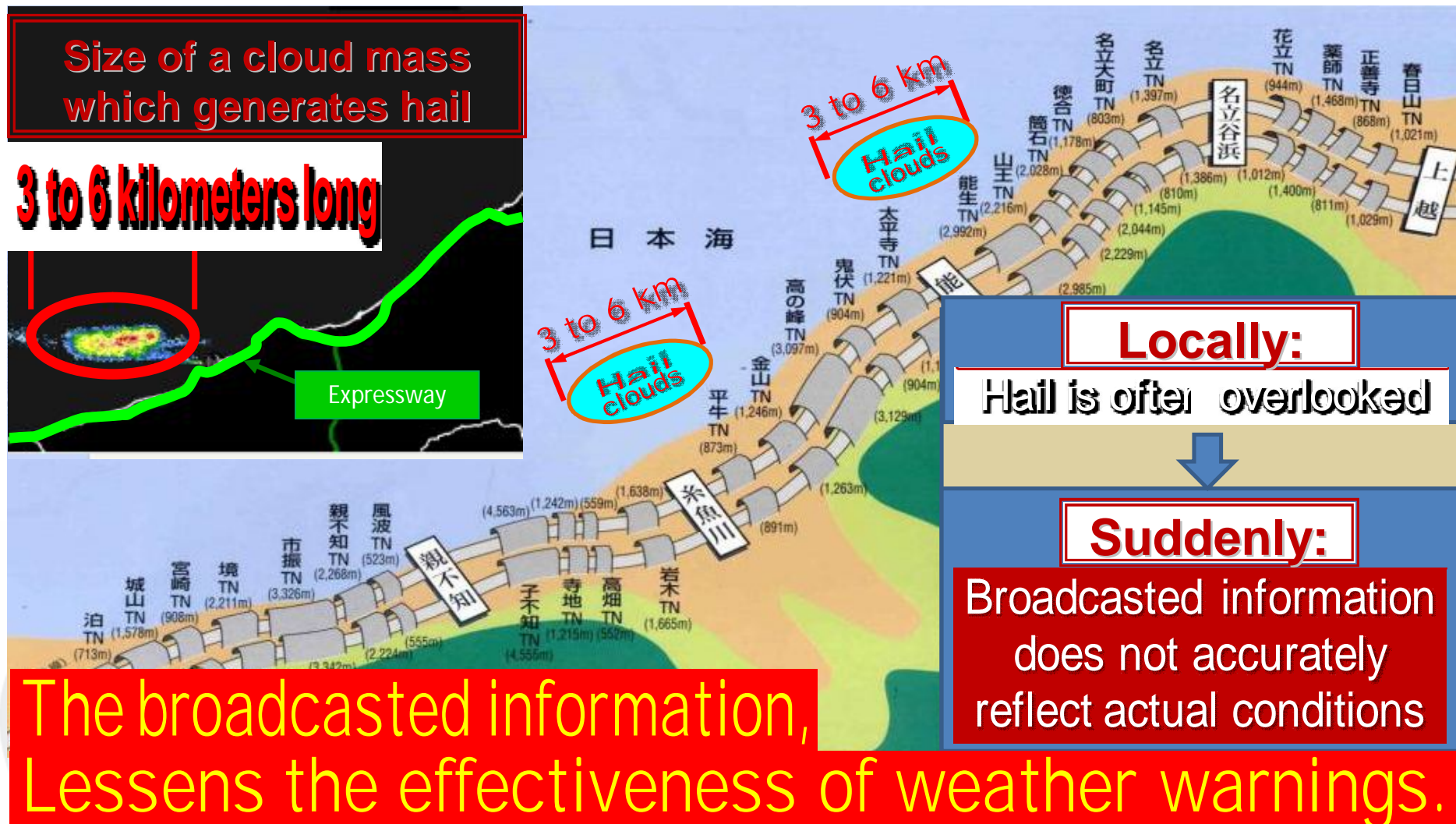


**However, the “sherbet” road surface condition is often overlooked even if there are many cameras.**

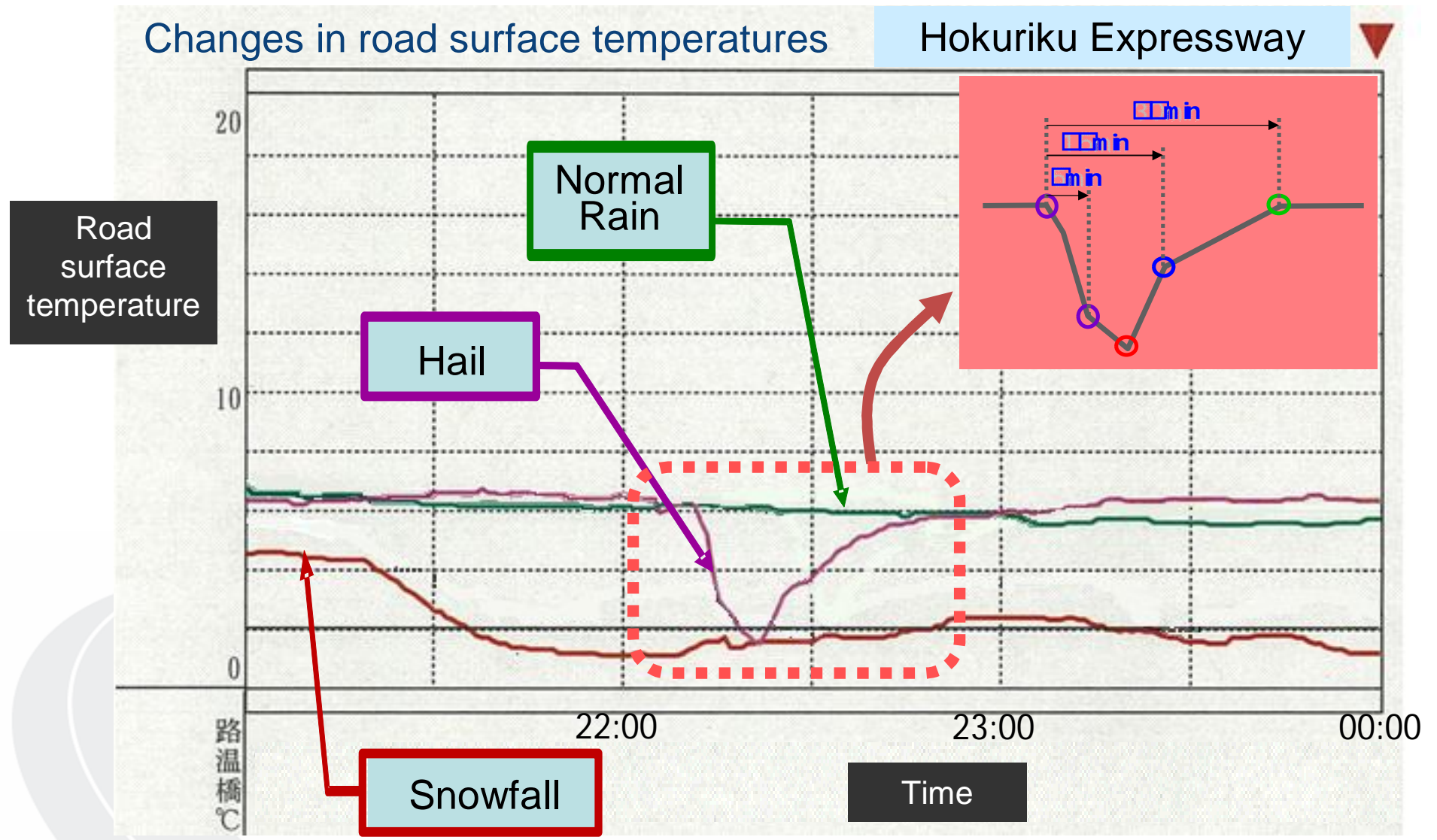
## Why is it overlooked?

## 2. Features of hail

### Locally generated hail

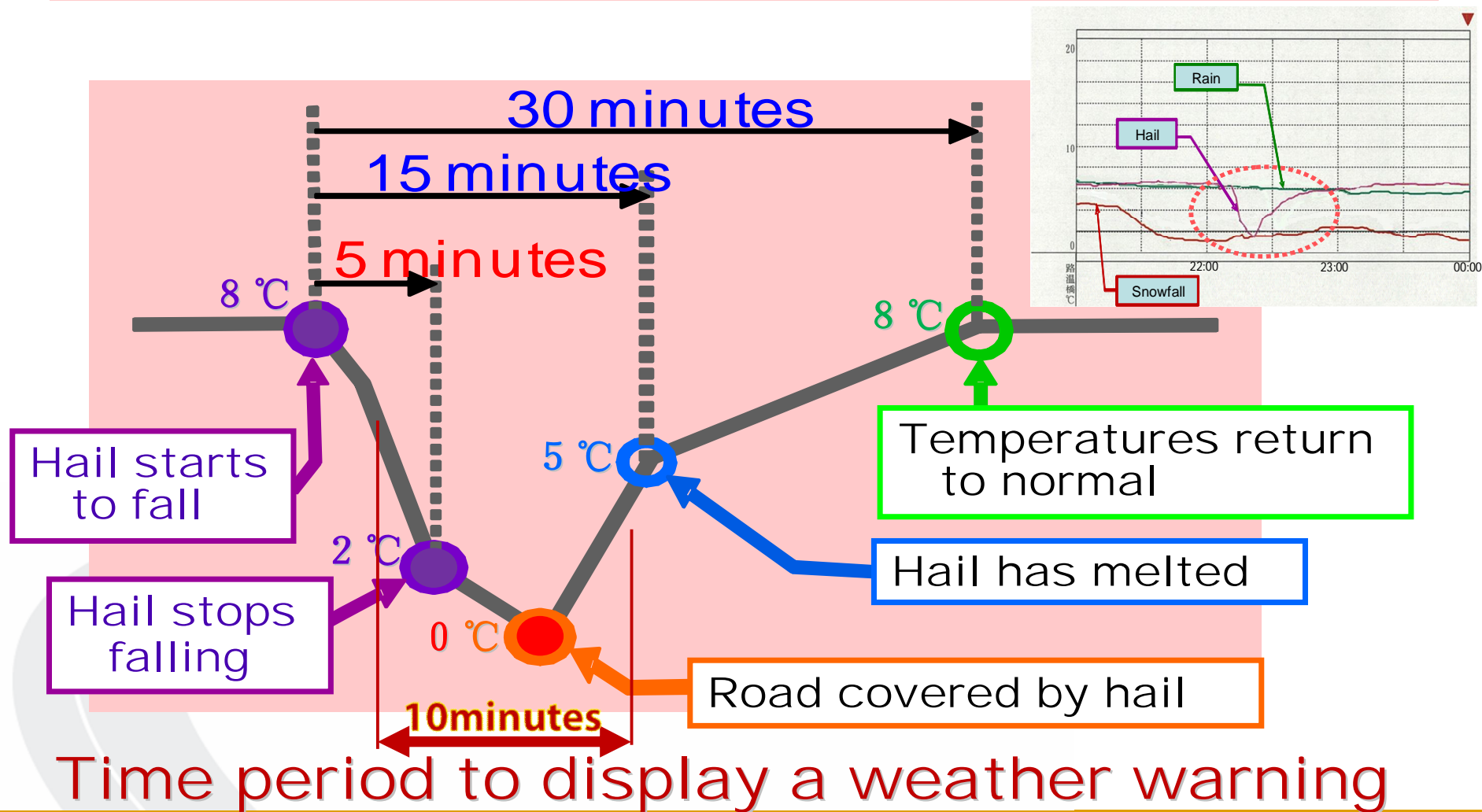


### 3. Relation between the weather of winter and the traffic accident



### 3. Relation between the weather of winter and the traffic accident

The situation of the road surface temperature change



#### 4. Development of hail detector

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# The concept

Obtaining real-time information.  
Providing highly reliable information.

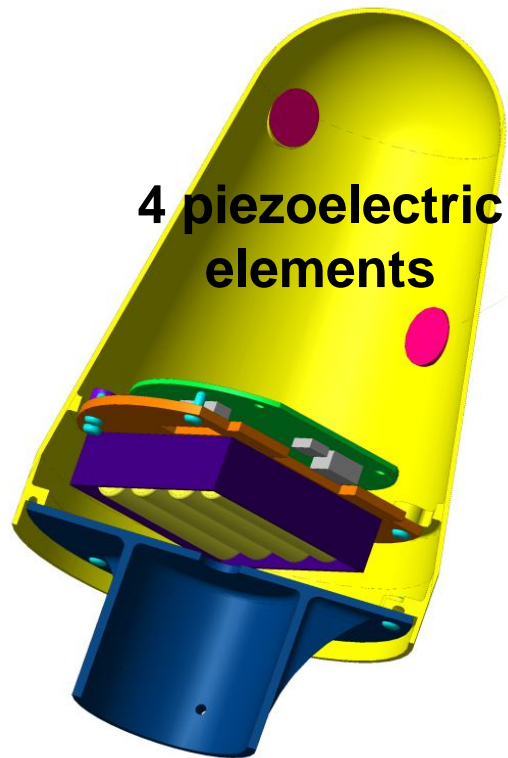


**Piezoelectric resin dome hail detector**



**OPERATION OF INFORMATION  
PROVISION SYSTEM USING HAIL DETECTOR**

## 4. Development of hail detector



### The feature of a hail detector

- ☐ Low Cost
- ☐ Small size and a light weight
- ☐ Structure which prevented the snow accretion
- ☐ The possibility of incorrect detection by a judgment program is low
- ☐ Linkage and extension are as easy as an information board, a surveillance camera, etc

Size	Weight	Rated apparent power	Sizeelectricity consumption
φ100× H160m m	About 400 g	DC12V	on standby:Less than 50mA on peak:800mA

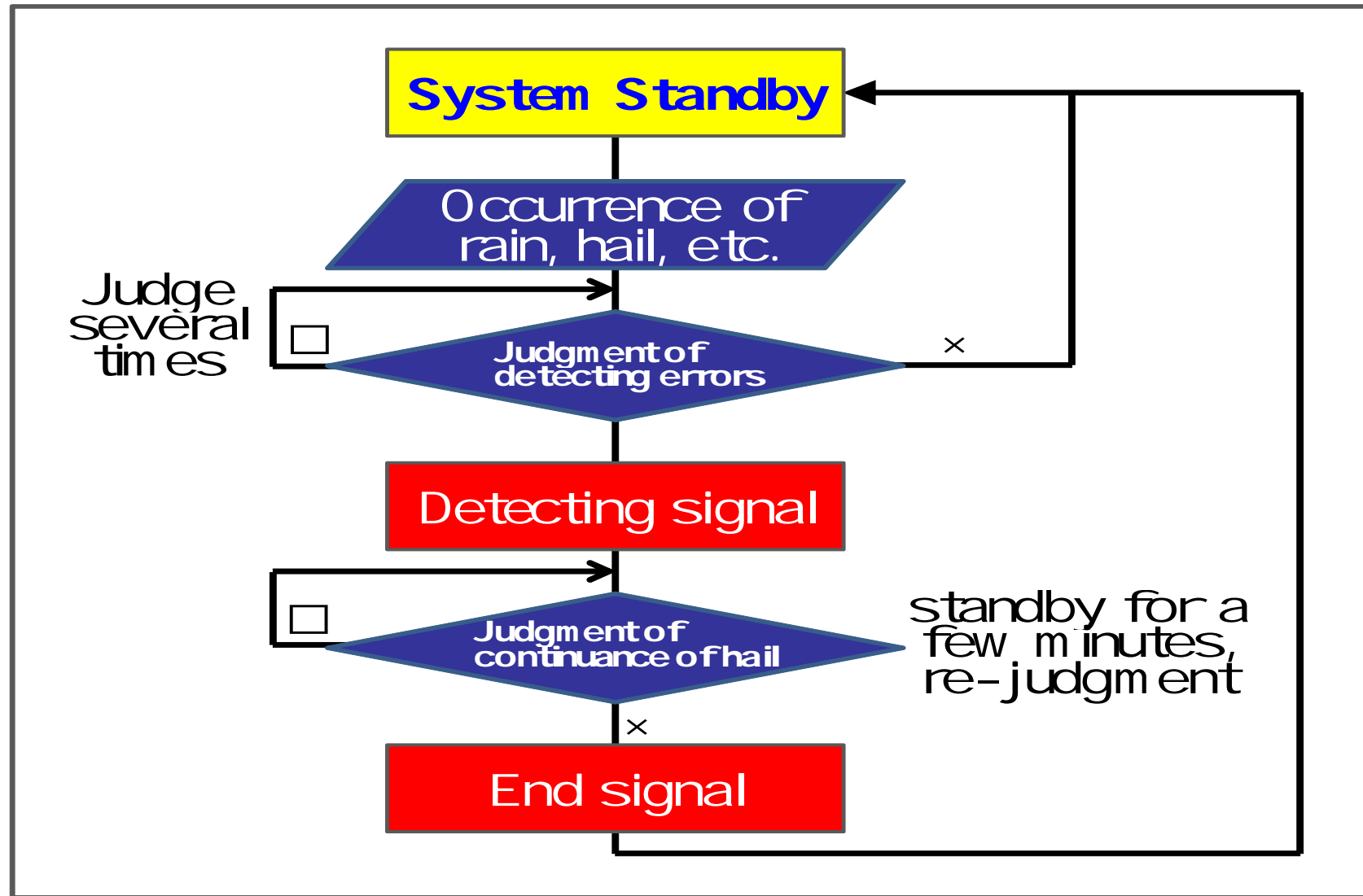
## 5. Operation by Information Provision system

Warning system using the hail detection equipment





## 5. Operation by Information Provision system



# 5. Operation by Information Provision system

Work condition report

The Counter

Acceleration of work

Hail prior counter  
Hail watch information

System  
Hail D

E-mail

**Weathernews, Inc**

Remote supervision by a radar



Information of situation

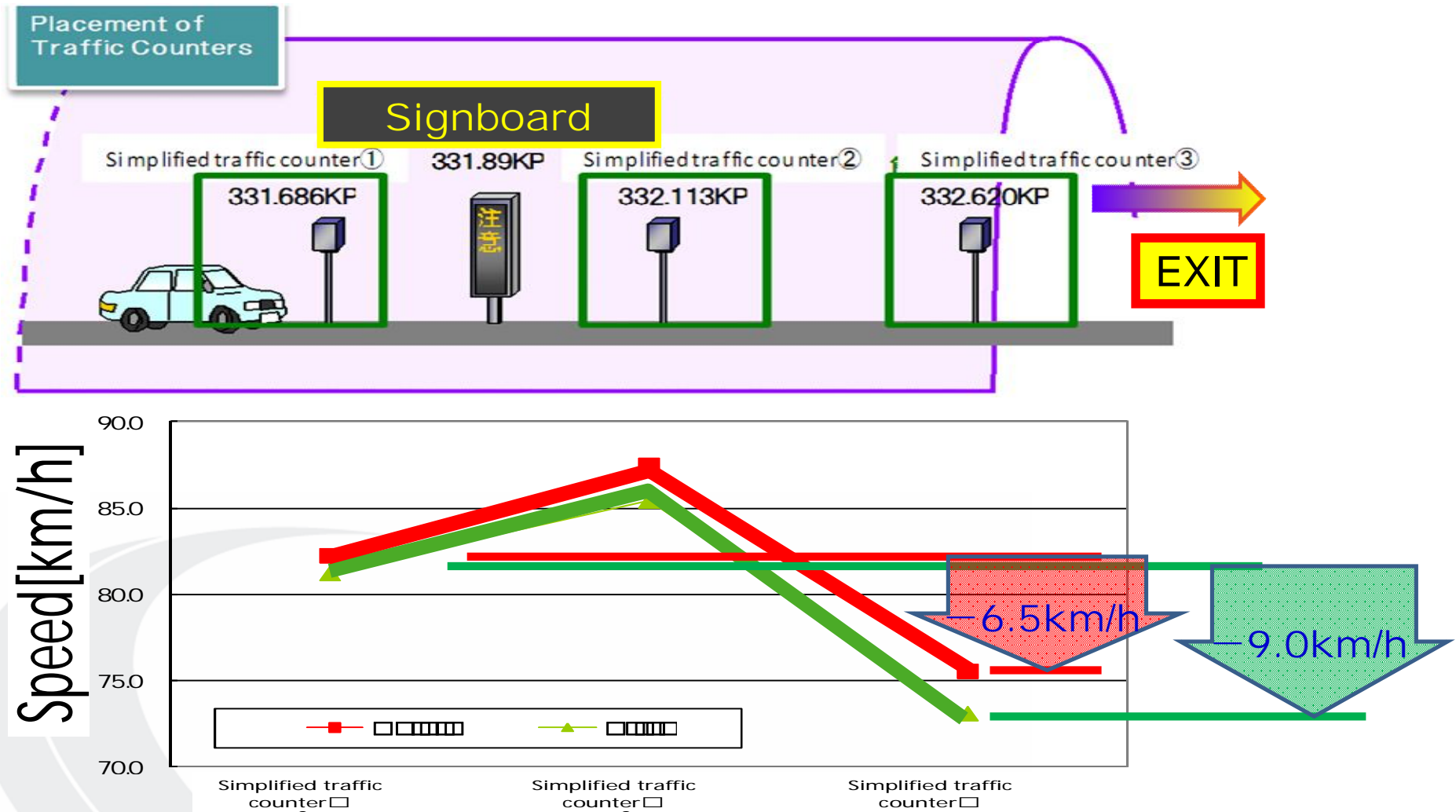


Information  
el

The exit hail information display in a tunnel

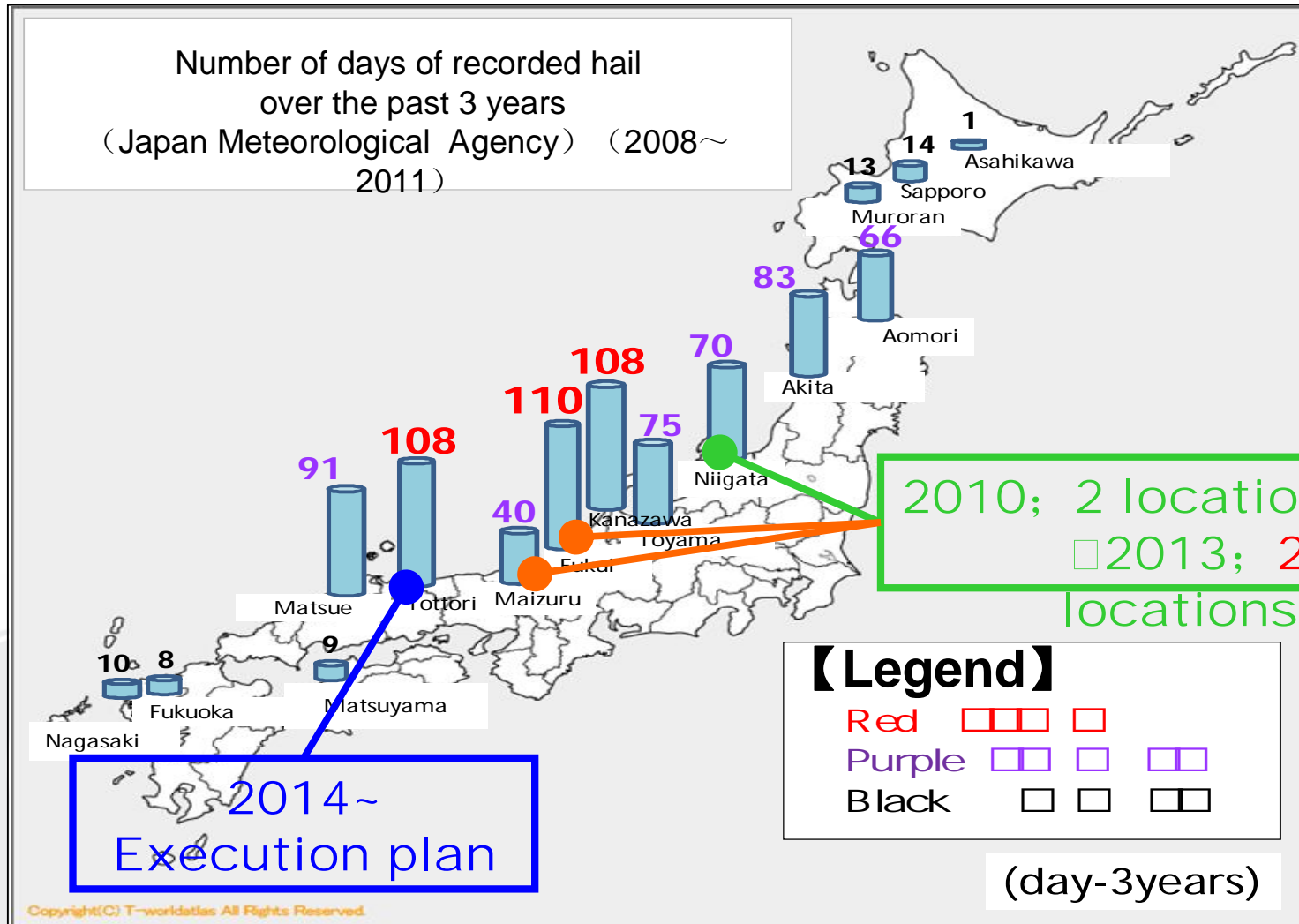
## 5. Operation by Information Provision system

Changes in speed before and after issuance of warning



## 6. Conclusion

### Areas where hail frequently falls in Japan



## 5. Conclusion

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Provide a safer driving environment

Credibility of broadcast information is important.

Acquire highly accurate  
information

Send reliable  
information in real-time

Establish a stable  
detection function



By issuing timely warnings and quickly removing snow, a safer driving environment can be provided even when meteorological conditions suddenly change.

# Thank you for your kind attention.



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The award type of president commendation



(ネクスコ東日本本社受賞会場にて)

