30th Anniversary of the Great Hanshin-Awaji Earthquake
【SDGs International Forum 2024: Climate Change × Disaster Reduction】
New Developments in disaster prevention and reconstruction in the age of a climate crisis: From the perspective of disaster waste

December 17, 2024

"Disaster Waste Disposal and Advance Preparationes"

Okumura Corporation's Initiatives

See : What do we observe?
Feel: What do we sense?
Act : How do we respond?

Yoshikazu Otsuka, Okumura Corporation

人と自然を、技術でむすぶ。
奥村組
OKUMURA CORPORATION

About Okumura Corporation①

A comprehensive construction company (General Contractor)

Business 1
Civil Engineering

Business 2
Building Construction







Business 3
Environmental

Someday...

About Okumura Corporation②

★Challenging new business domains!

Biomass Power Generation

Cultivation of Summer-Autumn Strawberries

Land-based Aquaculture

★Promotional activities too!

The Social Mission of the Construction Industry

SDGs

Especially in realizing "Sustainable Cities and Communities," the construction industry plays a major role. We are fully committed to creating a society that is not only rich and convenient but also safe and secure.

Furthermore,

Disaster response is also an important social mission entrusted to the construction industry!

For example,

Okumura Corporation's Initiatives (Introduction of disaster response-related initiatives)

■ **Experience in supporting responses to major earthquakes, heavy rainfall, and other disasters**

Since when : From the Great East Japan Earthquake in March 2011 to the Noto heavy rain disaster in September 2024 (present), engaged in various disaster response activities, during which time we developed disaster waste management technology.

For what kind of disasters : 12 disaster responses implemented (in chronological order)
1: Great East Japan Earthquake (2011), 2: Hiroshima City landslide (2014),
3: Kanto and Tohoku heavy rains (2015), 4: Kumamoto earthquake (2016),
5: Typhoon No. 10 (2016), 6: Northern Kyushu rains (2017),
7: Western Japan heavy rains (2018), 8: Hokkaido Eastern Iburi earthquake (2018),
9: Typhoon No. 19 (2019), 10: July 2020 heavy rains (2020),
11: Atami landslide (2021), 12: Noto Peninsula earthquake and heavy rains (2024)

In what capacity were we involved? Mainly involved in the following capacity:
Acting as a member of our disaster response team, as a member of academic societies (such as the Japanese Geotechnical Society), and as part of D.Waste-Net (Disaster Waste Treatment Support Network)

Okumura Corporation's Initiatives
(Introduction of research and development initiatives related to disaster response)

Ⅰ. Estimation of Types and Quantities of Disaster Waste

Enhancing efficiency and accuracy of disaster waste classification using hyperspectral cameras and other tools.

Ⅱ. Development of an Optimal Disaster Waste Treatment System

Developing systems to plan the arrangement of equipment and facilities for temporary disaster waste storage sites.

Ⅲ. Research on Disaster Prevention, Mitigation, and Recovery

Developing simulation tools for the collection and transportation of fallen volcanic ash.

Okumura Corporation's Initiatives
(Introduction of research and development initiatives related to disaster response) Ⅰ

Ⅰ. Estimation of Types and Quantities of Disaster Waste

(1) Experimental Imaging of Mixed Waste (Combustible Materials)

Classification	Kinds
Combustible materials	Vinyl
	Plastic
	Paper
	Cloth
	Wood

【Experimental Results】

✓ Hyperspectral cameras (HSC) appear effective for classifying combustible materials.

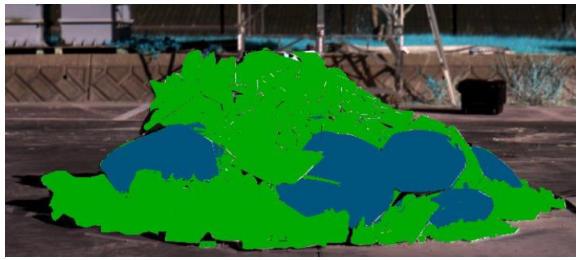
(2) Experimental Imaging of Incombustible Materials and Sediment

Classification	Kinds
Non-combustible materials	Crushed stone
	Scrap metal
	Concrete
	Bricks
	Glass
Soil	Decomposed granite soil

✓ Incombustible materials show lower classification accuracy compared to combustibles.

✓ Classification becomes challenging when sediment adheres to the waste.

(3) Experimental Imaging of piled Disaster Waste



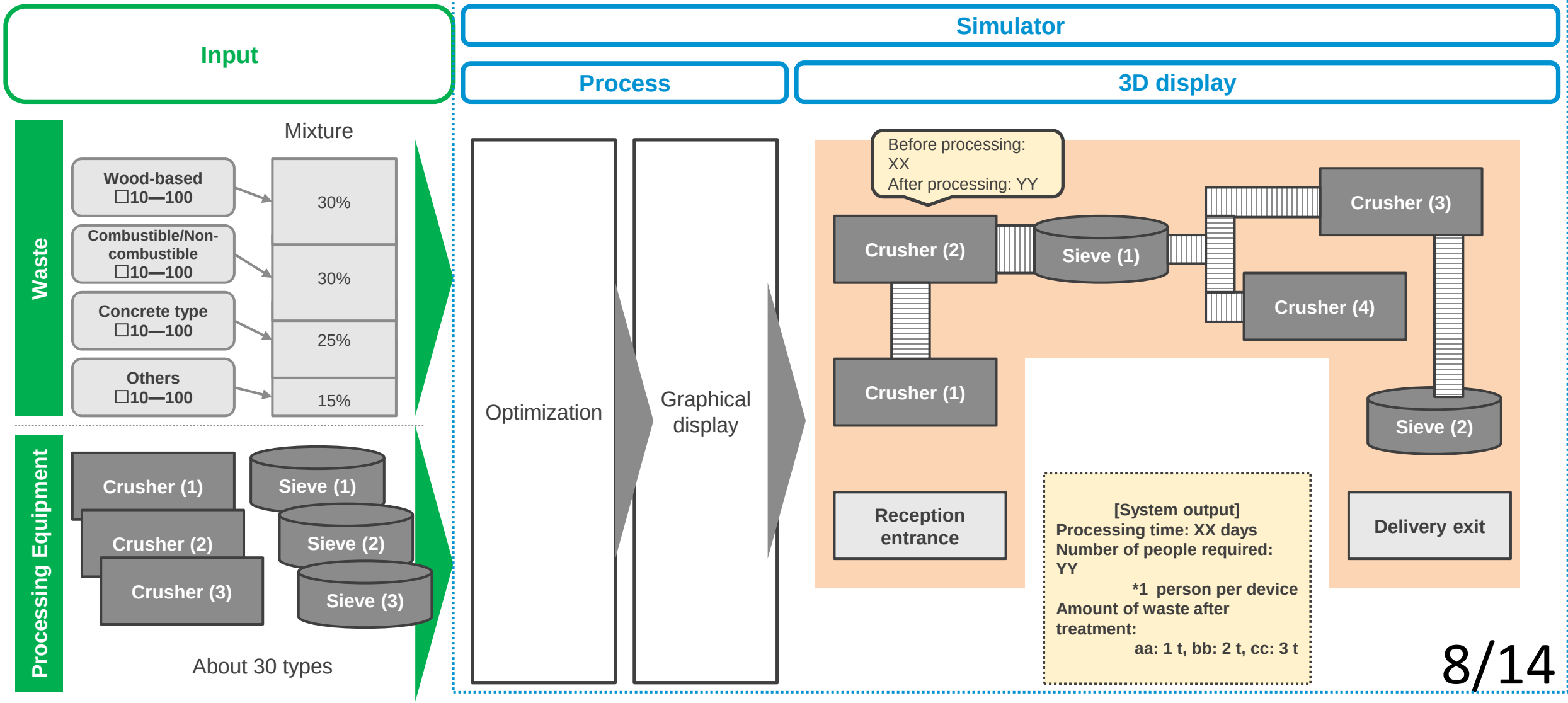
✓ Possible to divide into types

✓ Limit application scenarios

(1) Further division of combustible waste
(2) Detect other waste from combustible waste

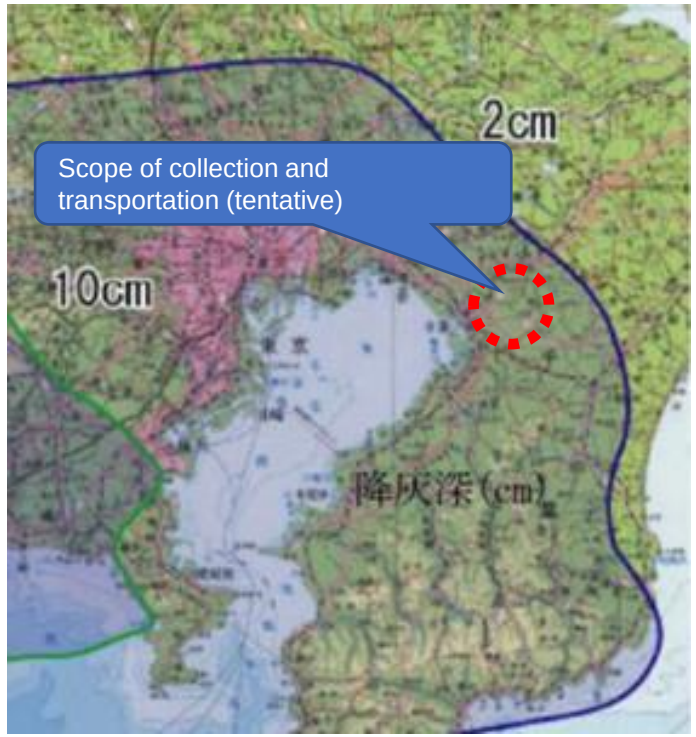
Okumura Corporation's Initiatives
(Introduction of research and development initiatives related to disaster response) Ⅱ

Ⅱ. Overview of the Optimal Treatment System



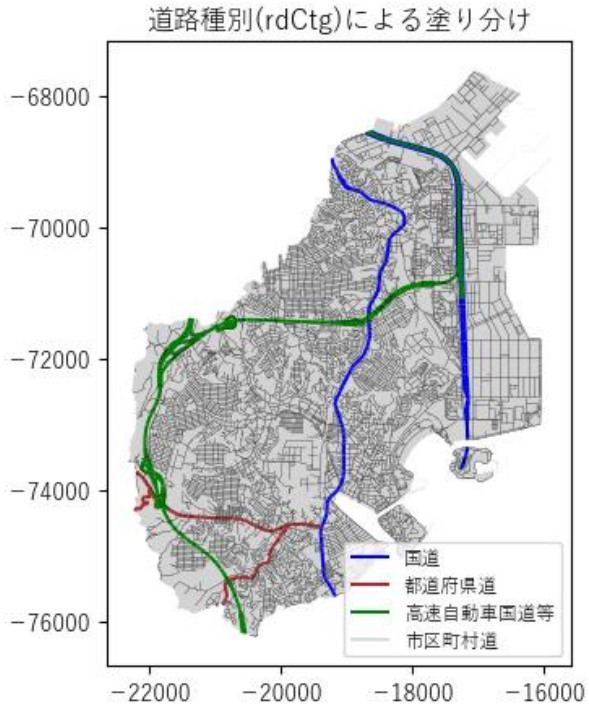
Okumura Corporation's Initiatives
(Introduction of research and development initiatives related to disaster response)Ⅲ

Ⅲ. Simulation of Volcanic Ash Collection and Transportation (Road Clearing Scenario)



[Requirements summary]

- ■ Terrain data: Roads from Geospatial Information Authority of Japan vector tiles Data
- ■ Target area
  - Road
- ■ Collection and transportation
  - Manpower, road sweeping vehicles (number, size), etc.



First edition simple simulator creation (2D)

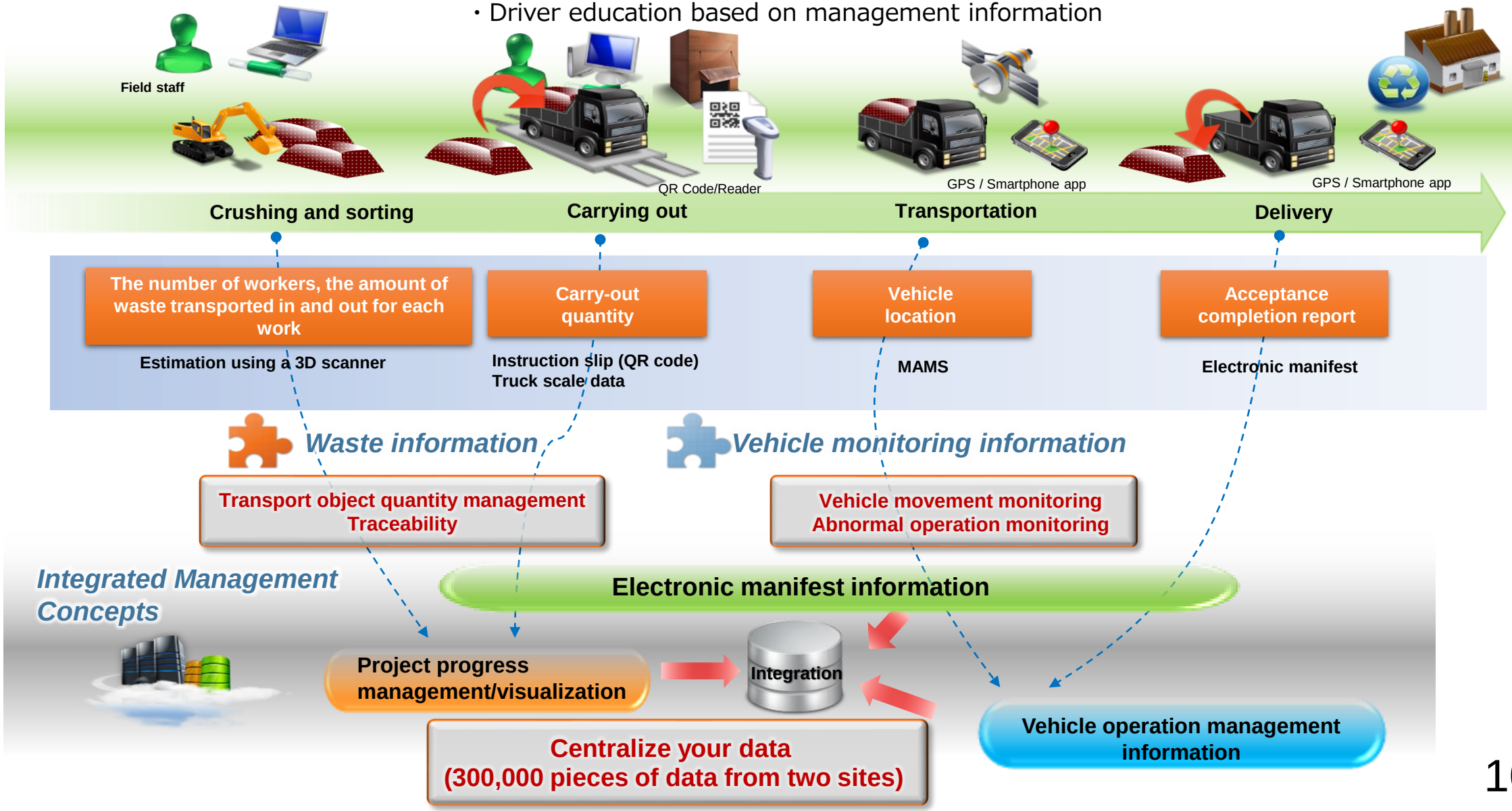
- Calculation of ash collection, transportation and processing time
- Visualization of ash removal status

In the future, this could be used to simulate snow removal and disaster waste collection.

Disaster waste response 1

Integrated Disaster Waste Management System (Proprietary Technology)

- Visualization of personnel, quantities of waste being transported in and out, and temporary storage amounts.
- Unified management of real-time vehicle information and electronic manifest data.
- Prevention of vehicle accidents and impacts on surrounding residents
- Driver education based on management information



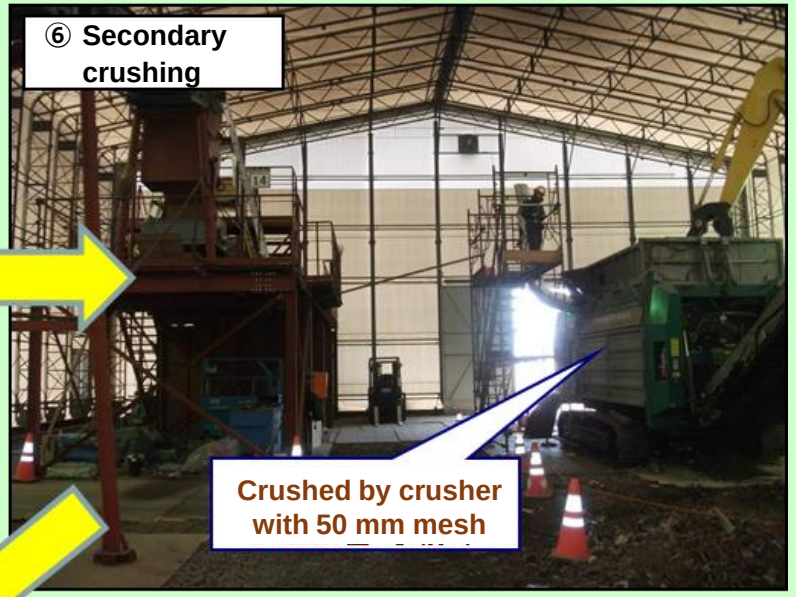
Disaster waste response 2

Photo of disaster waste sorting

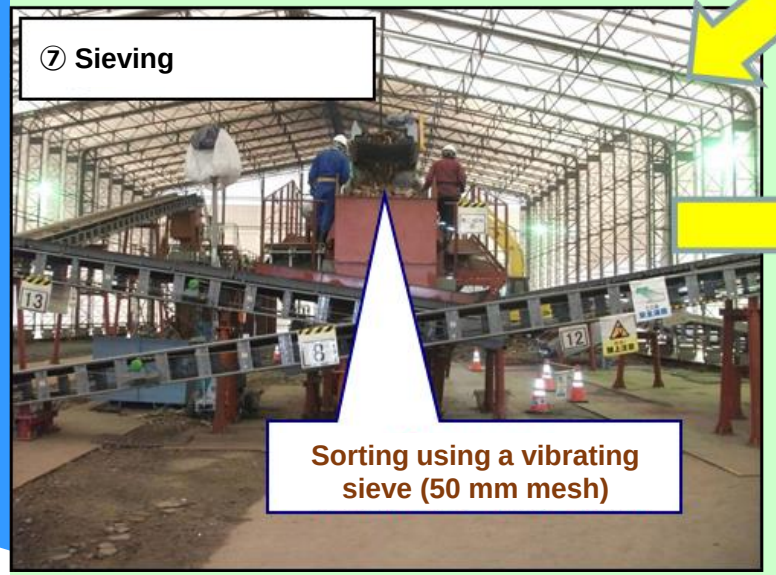
Crushing and sorting plants (2)

⑤ Manual sorting

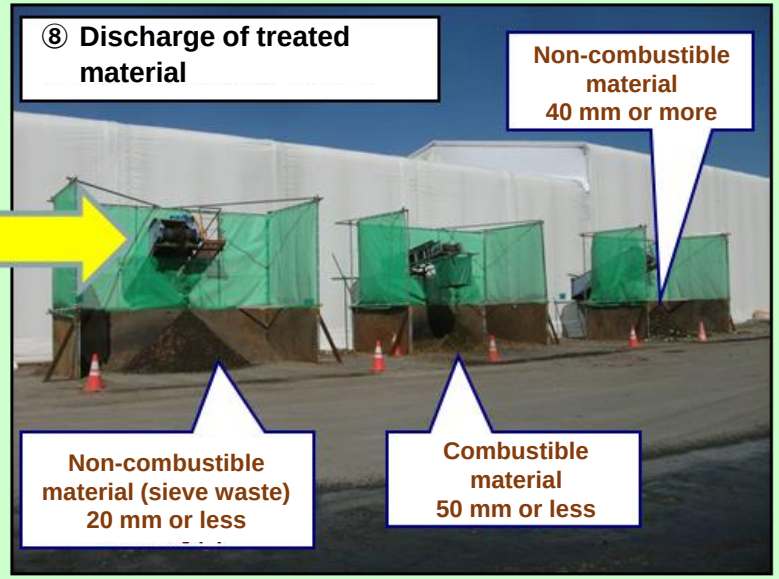
⑥ Secondary crushing



⑦ Sieving



⑧ Discharge of treated material

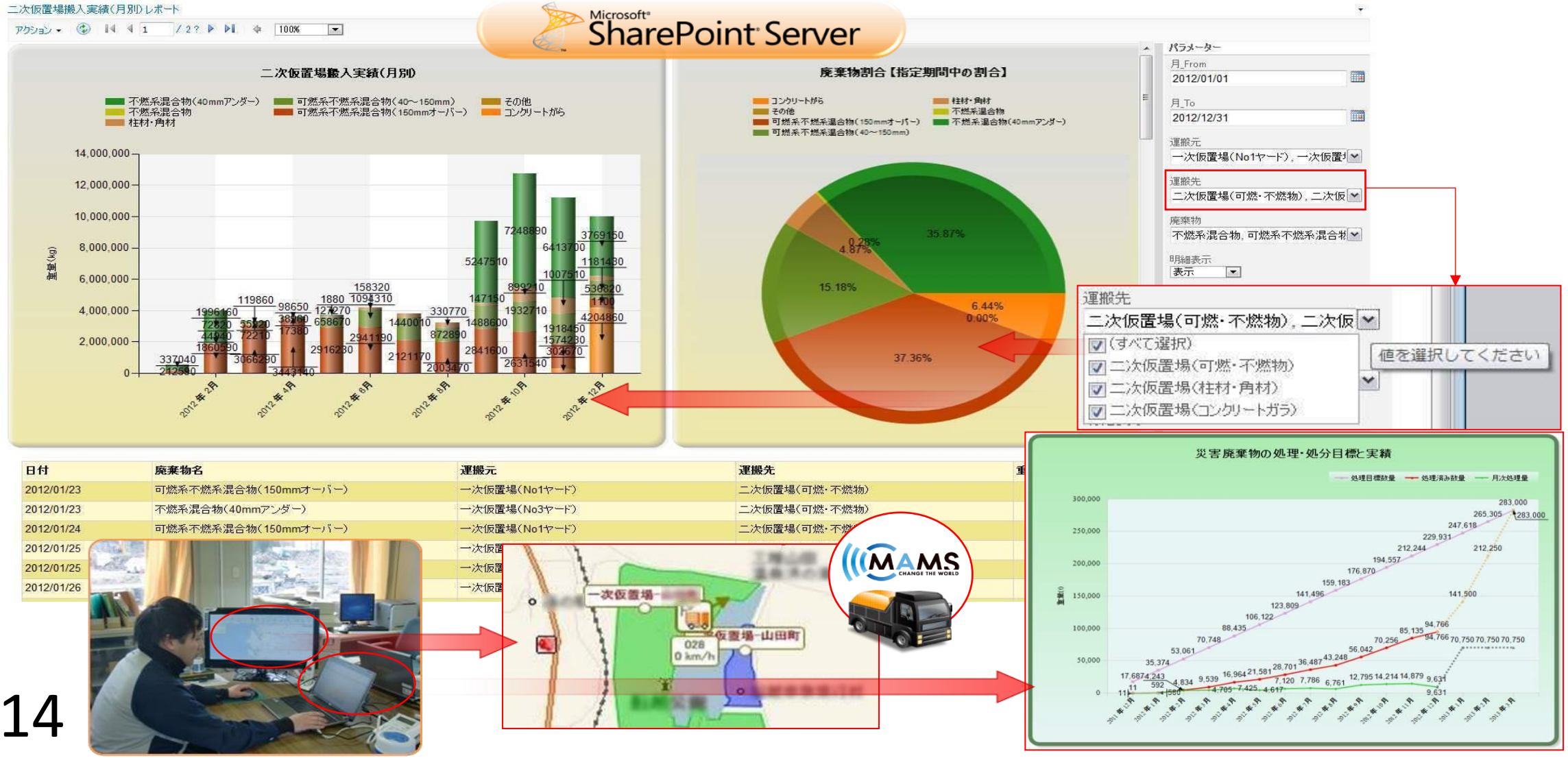


Disaster waste response 3

Disaster waste integrated management system (our proprietary technology)

Data collected and stored in the cloud

- Daily progress management reports displayed on the portal
- Multiple parties can check the process and progress anytime, anywhere.



Summary

Capturing the Essence of Disaster Response

- Intellectual curiosity
- Personal beliefs and passion
- Macro and micro perspectives
- Long-term vision

Preparing for Future Disasters

- Heavy rain disasters and landslides
- Earthquakes directly beneath the Tokyo metropolitan area
- Nankai Trough Earthquake
- Heavy rain disaster
- Volcanic disasters

See: What do we observe?

Feel: What do we sense?

Act: How do we respond?

Thank you for your attention.