CRISIS MANAGEMENT CONFERENCE 2022

Challenges to Fire and Emergency Service Responses

08.11.2022

DAY - 1

Rapid Urbanization:
A challenge to Crisis Management

09.11.2022

DAY - 2

Challenges to Fire and Emergency Service Response in War like situations and preparedness to deal with such situations

-

DIRECTOR'S SPEECH:

Head of Departments, Representatives from Tokyo, Singapore, Brussels, Ulaanbaatar, Delhi, and New Taipei City and all the participants of the Network for Crisis Management, Namaste and a very warm welcome! to the Crisis Management Conference -2022. Delhi is honored to be the host city for this year's Crisis Management Conference and thankful to Tokyo for providing continuous and unconditional support in shaping the conference. I am given to learn that the theme for this year's conference is **"Challenges to Fire and Emergency Service Responses"** which I found is highly relevant in the present scenario. In addition to this, I am informed that the upcoming 02 days deliberations shall be focused on addressing the challenges due to Rapid Urbanization and war like scenarios.

Since the emergence of civilization, our scientists, engineers have put tremendous efforts to develop infrastructure to ensure comfort and growth of mankind. The height of their vision is reflected in the height of the buildings that are coming up in the metro cities. Every upcoming city takes a giant leap in erecting sky scrapers. The height is not the only criteria, horizontal spread and volumes of the buildings are also on stretch by the wisdom of our engineers. The technology and knowledge transfer rate is at its peak. The development, which was normally seen in the developed world, is being replicated at a very rapid rate in the developing nations.

According to NASA earth observatory report, the capital of India, New Delhi, has been experiencing one of the fastest urban expansions in the world. Vast areas of croplands and grasslands are being turned into streets, buildings, and parking lots, attracting an unprecedented amount of new residents. **By 2050, the United Nations projects India will add 400 million urban dwellers, which would be the largest urban migration in the world for the thirty-two year period.**

Delhi being a land of opportunities, most people (and their families) move into the city for work, education, healthcare, tourism and other business purposes. By 2028, New Delhi is expected to surpass Tokyo as the most populous city in the world. The increased urbanization has several consequences on the service delivery of the fire and emergency services which I believe, the CMC 2022 must be deliberating.

Further, in the present times the clash of communities, terrorism, Riots, cross border conflicts are on the hike, which may end up in a situation like war. All of these situations adversely affect the life safety of the citizen and pose special challenges to the response of fire and emergency services. We know the life is priceless, but at the same time the price of the infrastructure is also no less. It takes years and years together to develop the infrastructure. The enemy requires only a fraction of second to destroy it. The destruction of the infrastructure not only destructs the building but also incapacitates the entire civilization. We know, behind every extinct civilization, natural or manmade disasters are there. **We also know that the fire and emergency services are not in the direct line of decision making, which can influence the decision of outbreak of war, but it is seen that they are also on the target of the enemies**. The visuals and news from Ukraine war arena are of indicative of this, which should not be there.

The provisions of the present Geneva Convention constitute no obstacle to the humanitarian activities which the International Committee of the Red Cross or any other impartial humanitarian organization may, subject to the consent of the Parties to the conflict concerned, undertake for the protection of civilian persons and for their relief.

The fire fighting and rescue service are also humanitarian activities and therefore it may not be in exaggeration, if United Nations be approached to think of formation of a society on the lines of International Red Cross Society.

With these words, I declare the conference open and wish a huge success to their endeavors of building networking.

Atul Garg
Director, Delhi Fire Service

DAY 1 - 08.11.2022 CRISIS MANAGEMENT CONFERENCE – 2022 (DELHI - INDIA)	
SESSION 1 :RAPID URBANIZATION : A CHALLENGE TO CRISIS MANAGEMENT **Chief Guest: Sh. Atul Garg, Director, Delhi Fire Service** **Chairman of Session: Sh. R.C. Sharma, Former Director, Delhi Fire Service** **Host: Dr. Priyanka Jha, Faculty, IP University, Delhi**	
TIME	**DETAILS**
13:00 - 13:05	**Announcement by host of the day, Dr. Priyanka Jha,** **Presentation of bouquet to Chief Guest Sh. Atul Garg and Chairman of session Sh. R.C. Sharma, by Dy. Chief Fire Officer Dr. Sanjay Kumar Tomar**
13:05 - 13:10	**Speech of Director, Delhi Fire Service**
13:15 - 13:20	**Introductory Session by Dr. Priyanka Jha (introduction of chairman)**
13:20-13:25	**Introduction of presenters by Sh. Somvir Singh**
13:25 - 13:40	1st Presentation Mr. Michael Chua Singapore Civil Defence Force, Singapore **(Leveraging Technology to Transform Singapore Civil Defence Force)**
13:40 - 13:45	Q & A Session
13:45 - 14:00	2nd Presentation Mr. HAMANAKA, Akihiko Tokyo Metropolitan Government, Tokyo - Japan **(New Damage Estimates in the event of disasters such as a major earthquake hitting Tokyo)**
14:00 - 14:05	Q & A Session
14:05 - 14:20	3rd Presentation Mr. MACHIDA, Tatsuhiko Tokyo Fire Department, Tokyo - Japan **(Challenges and Countermeasures of the Tokyo Fire Department in Earthquake Disaster)**
14:20 - 14:25	Q & A Session
14:25 - 14:40	4th Presentation Mr. Cheng, Cheng – Chi Taipei City Fire Department, Taipei - Taiwan **(Disaster Relief Volunteer & Community Preparedness in Taipei City)**
14:40 - 14:45	Q & A Session
14:45 - 15:00	5th Presentation Mr. M. V. Deshmukh Maharashtra - India **(Urbanization and Fire & Life Safety Challenges)**
15:00 - 15:05	Q & A Session
15:05 - 15:15	**Closing Remarks by Dr. Priyanka Jha**
15:15 - 15:20	**Closing , Announce for the next session on 09.11.2022**

DAY 2 - 09.11.2022 CRISIS MANAGEMENT CONFERENCE – 2022 (DELHI - INDIA)	
SESSION 1 : CHALLENGES TO FIRE AND EMERGENCY SERVICE RESPONSE IN WAR LIKE SITUATIONS AND PREPAREDNESS TO DEAL WITH SUCH SITUATIONS **Chairman of session: Sh. R.C. Sharma, Former Director, Delhi Fire Service** **Special Guest and speaker: Dr. (Prof.) H. K. Dangi, eminent faculty, School of Economics, Delhi University** **Host of the Day: Dr. Priyanka Jha, Faculty, IP University, Delhi**	
TIME	**DETAILS**
13:15 - 13:20	**Introductory Session by Dr. Priyanka Jha**
13:20-13:25	**Introduction of presenters by Sh. Somvir Singh**
13:25 - 13:40	1st Presentation Dr. S. K. Tomar Delhi Fire Service, Delhi - India **(Challenges of Fire Services during War like situations)**
13:40 - 13:45	Q & A Session
13:45 - 14:00	2nd Presentation Dr. (Prof.) H. K. Dangi Delhi - India **(Use of Modern Technology for fire and emergency situation in war like situation)**
14:00 - 14:05	Q & A Session
14:05 - 14:20	3rd Presentation Mr. Cheng, Yu-Lun New Taipei City Government, Taiwan **(Emergence Data Platform for Smart Disaster Prevention)**
14:20 - 14:25	Q & A Session
14:25 - 14:40	4th Presentation Mr. Somvir Singh Delhi Fire Service, Delhi - India **(Addressing psychological issues to improve response in war like scenarios)**
14:40 - 14:45	Q & A Session
14:45 - 15:00	5th Presentation Col. Rakesh Verma Delhi - India **(Imperatives of Fire Safety and Emergency Response in Contemporary War like situations)**
15:00 - 15:05	Q & A Session
Session:2	
15:05 - 15:15	**Closing Remarks by Dr. (Prof.) H. K. Dangi**
15:15 - 15:20	**Summary of the Conference by the chairman of session Sh. R.C. Sharma**
15:20 - 15:35	**Annual Report from the Secretariat, Announce of the Next Host City and address by next host city Tokyo**
15:35 - 15:40	**Vote of Thanks by Sh. Manish Kumar, Delhi Fire Service**

DAY - 01:
RAPID URBANIZATION : A CHALLENGE TO CRISIS MANAGEMENT

CURRICULUM VITAE
[Presentation overview]

Presenter – Mr. Michael Chua
Position – Director Operations, Singapore Civil Defence Force

SCDF
The Life Saving Force
. . . for a safer Singapore

Leveraging Technology in Transforming SCDF

Captain Stacy Lian
Staff Officer, Current Operations, Operations Plans and Policy Branch
Operations Department
Singapore Civil Defence Force

Scope

1. Introduction to SCDF
2. Responders' Performance Vehicle
3. Integrating Robotics in Firefighting Operations
4. Leveraging Unmanned Aerial Vehicles
5. Enabling and Empowering the Community

Singapore Civil Defence Force

Mission

To protect and save lives and property for a safe and secure Singapore

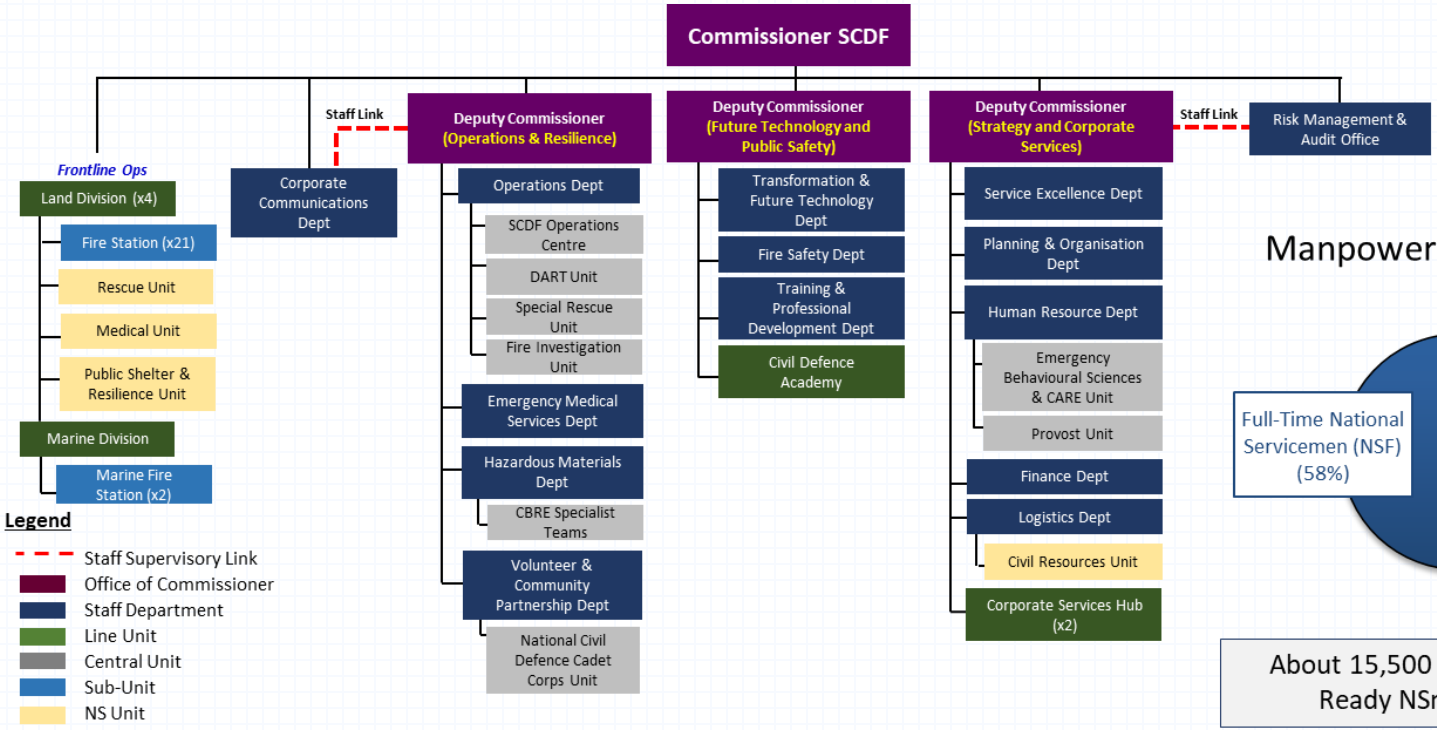
Vision

A world-leading life saving force through people innovation & partnership for an emergency ready nation

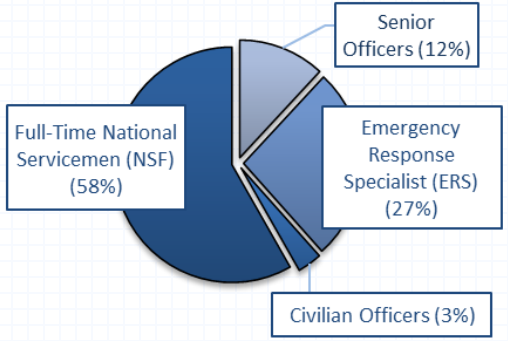
Core Values

- We take **pride** in saving lives and property
- We **care** for our people and those we serve

Our SCDF, Our People



Manpower Strength



About 15,500 Active Operationally Ready NSmen (ORNSmen)

UNCLASSIFIED

Primary Roles & Functions

Firefighting & Rescue

Hazardous Materials

Emergency Medical Services

Fire Safety & Public Protection

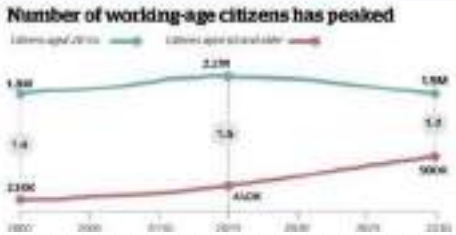
Community Engagement

SCDF's Transformation – Driving Forces

1 Increasing Workload

- Traveller Volume
- Ambulance Load

2 Manpower Constraints

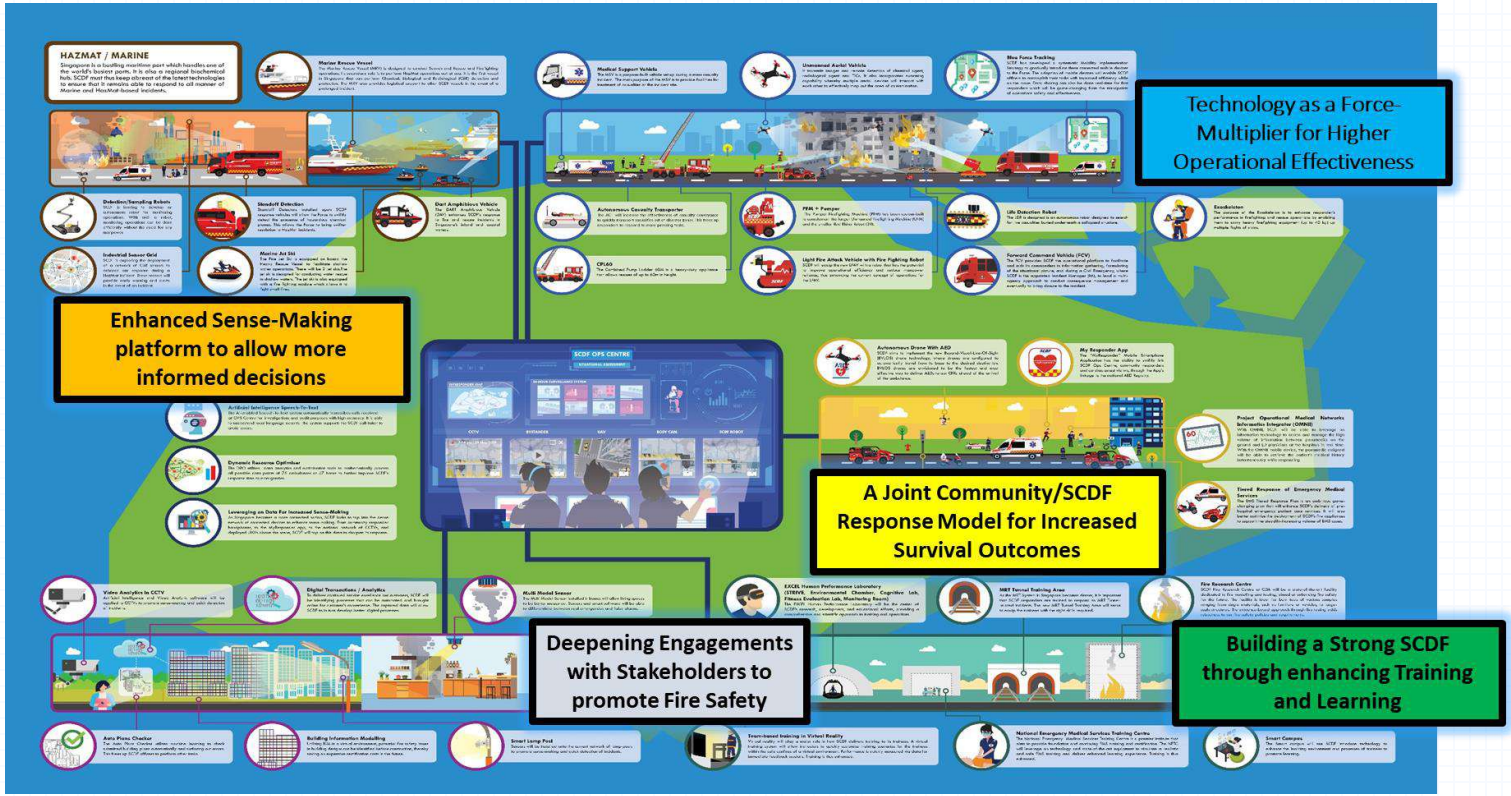


3 Higher Public Expectations

4 Ageing Population

SCDF Transformation Vision 2025

SCDF Transformation Vision 2025



Leveraging Science and Technology

Responders' Performance Vehicle

Integrating Robotics in Firefighting Operations

Leveraging Unmanned Aerial Vehicles

Responders' Performance Vehicle (RPV)

Innovating for Excellence

1. First known mobile facility in the world to leverage the latest in science and technology to provide comprehensive responder rehabilitation capabilities

2. Enhances recovery and safety of responders to deliver high operational performance during prolonged operations, reduces the chances of heat injuries

2003
MBCU[1] was operationalised

2013
RPM[2] was launched

2016
MBCU and RPM concepts were validated and proven effective. Research to further enhance the concept began.

2019
Initial design and concept of RPV was

Aug 2020
RPV was operationalised

[1]Mobile Body Cooling Unit
[2]Responders' Performance Module

Responders' Performance Vehicle (RPV)

Collaborative & Scientific Approach

1. The RPV is the result of close collaboration between SCDF and our partners:
   a. Operationally Ready National Service (ORNS) medical doctors
   b. Researchers from the Department of Physiology, NUS Yong Loo Lin School of Medicine
   c. HOPE Technik - a local engineering company

2. Leveraged advancements in heat injury management and latest developments in sports science knowledge

3. Developed through a process of thorough evaluation of latest scientific evidence, field testing, prototyping, and incorporated engineering, scientific and clinical expertise

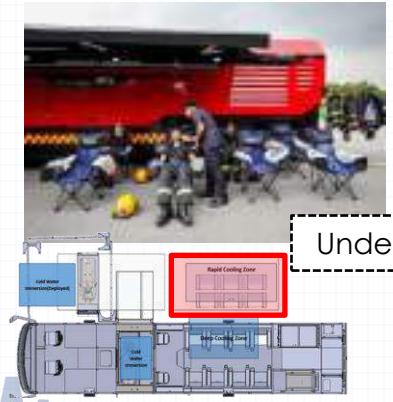
4. Award winning innovation: Institution of Engineers, Singapore (IES) Prestigious Engineering Achievement Award 2021

Responders' Performance Vehicle (RPV)

Concept of Operations

1. 3 Cooling Zones – **Rapid Cooling Zone + Deep Cooling Zone + Cold Water Immersion**
2. Mandatory triage point to assess responders exiting from the operational area
3. On-site rehabilitation to keep responders safe and sustain performance for prolonged operations

Rapid Cooling Zone – 28 pax



Under 37.9°C

Deep Cooling Zone – 8 pax

Above 37.9°C

Cold Water Immersion – 1 Pax

Above 38.5°C

Integrating Robotics in Firefighting Ops

Enhanced Ops Effectiveness and Responders' Safety

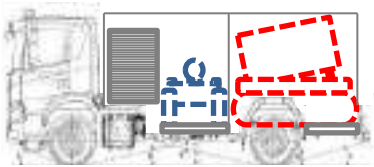
1. Unmanned Firefighting Machine (UFM) first introduced in 2014; Successfully deployed at numerous operations
2. Adapting Robotics negates the need to commit responders into dangerous areas and enhances their safety
3. Unmanned Ground Vehicles (UGV) Capabilities Roadmap

UNMANNED GROUND VEHICLES (UGV) CAPABILITIES ROADMAP

Areas of Focus	Before 2020	2021	Towards 2025	2025 - 2030
Environment Sensing (Perception)	Basic Waypoint Navigation	Navigation in Challenging Terrains	Autonomous Exploration	Swarm Technology for Multiple Purposes
Planning and Decision Making (Analysis)	Basic Monitoring - Location, Camera, Battery/Fuel, Sensors	Able to monitor and track all robots at incident	UGV to make sense of sensor information; Machine learning for UGV to recommend actions	
Operations and Control (Action)	Single user control Single robot to carry out a single function	Modular & Multipurpose Robots	Single user control multiple robots with BVLOS and Autonomous features	

2-Tier Approach in Firefighting UGV CONOPS

Tier 1 (Fire – Light to Moderate)	Tier 2 (Fire – Large)
✓ Quick deployment (Pump Ladder + Red Rhino) ✓ Lower monitor output (equivalent to 1 x 64mm jet) ✓ Perform simple tasks which would otherwise be executed by 1-2 men	✓ Higher monitor output and range ✓ Higher penetration power to reach seat of fire ✓ Perform other functions to support prolonged firefighting operations



Leveraging Unmanned Aerial Vehicles

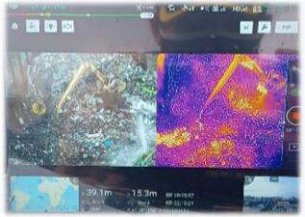
Enhanced Situational Awareness and Sensemaking with UAVs

1. Unmanned Aerial Vehicles (UAVs) adopted in SCDF since 2014
2. Promising results as an aerial platform to support emergency response
3. UAVs are being trialled in SCDF to support :
   a. Sense-making capabilities in low visibility conditions
   b. Tactical operations such as HazMat monitoring and to support firefighting operations
   c. Routine operations such as fire safety enforcements

Leveraging Unmanned Aerial Vehicles

3-Tier Risk-Based UAV Capability Development

Tier 1 (Sensemaking UAVs)	Tier 2 (Tactical Response UAVs)	Tier 3 (Large-sized UAVs)
✓ General sensemaking ops ✓ Low risk operations, high operational impact	✓ Carries specialised payload to support tactical operations ✓ Higher risk due to the nature of operations and weight class	✓ Highly tactical and specialised UAVs with a heavy-weight class ✓ Envisioned to carry personnel and heavy payloads



Aerial Surveillance

3D Mapping

Firefighting UAV

HazMat UAV

BVLOS UAV

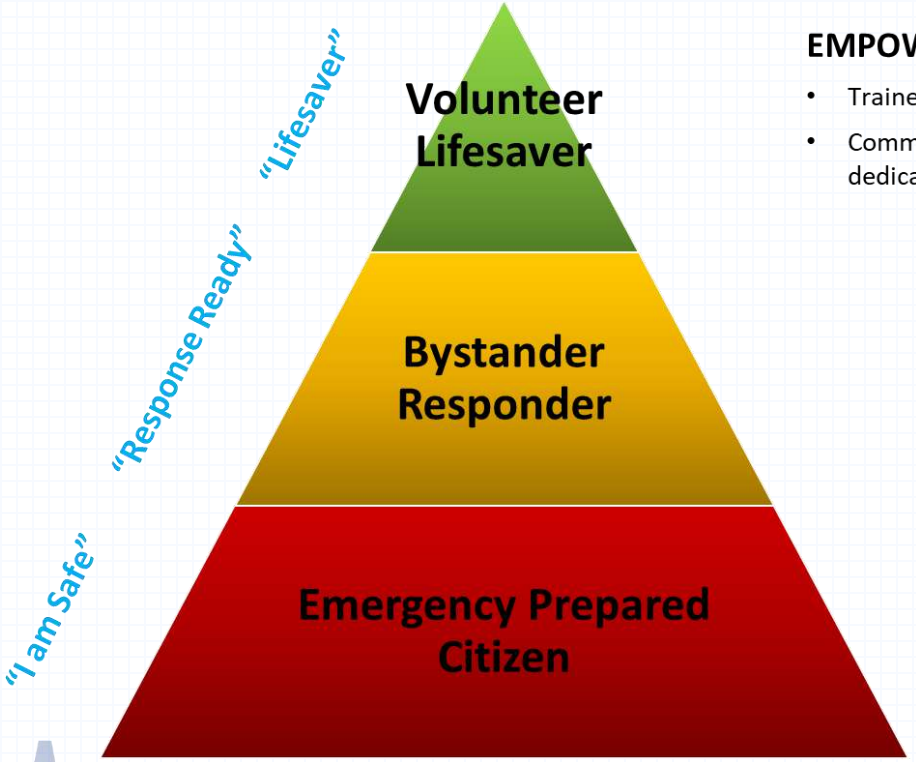
Large-sized UAV for R&E and Firefighting (Concept)

Enabling & Empowering the Community

SG Secure

1. Level up core competencies of community to be first responders during emergencies
2. Towards an Emergency Ready Nation
3. Strengthen community response against threat of terrorism

Enabling & Empowering the Community



EMPOWER THE ACTIVE RESPONDER

- Trained in Life Saving Skills
- Commits volunteer hours and serve Community as a dedicated responder

ENABLE THE BYSTANDER RESPONDER

- Trained in Life Saving Skills
- Involves in the chain of saving lives but does not commit volunteer hours
- Examples: Calls 995 & retrieve AED

ENGAGE THE CONCERNED CITIZEN

- Basic EP Knowledge awareness
- Knows how to help and get out of harm's way in times of emergency
- Examples: Self evacuation & use mySCDF app to take snap shots

Enabling & Empowering the Community

Junior CD Lionhearters

National CD Cadet Corps

CD Lionhearters

CD Auxiliary Unit

Preschool Resource Kit

Primary School Curriculum

Emergency Preparedness (EP) Days

Public Education Programs

Community Emergency Preparedness Programme (CEPP) – Training + Online

Future-Ready

Future 4-Storey Emergency Preparedness Centre

Future Ready to Safeguard Our Nation

CURRICULUM VITAE
[Presentation overview]

Presenter – Mr. Hamanaka Akihiko
Position – Director Planning Section,
Tokyo Metropolitian Government

New Damage Estimates in the event of disasters such as a major earthquake hitting Tokyo

Disaster Prevention Division, Bureau of General Affairs, Tokyo Metropolitan Government
HAMANAKA Akihiko

TOKYO METROPOLITAN GOVERNMENT 東京都

Background to revisions to damage estimates

March 2011: Great East Japan Earthquake

Estimates for damage in Tokyo following earthquake centered on Tokyo, or Nankai Trough earthquake, published (2012-2013)

Developments in the decade since

- ✓ New insights and knowhow about damage due to major earthquakes etc.
- ✓ **Massive earthquake presumably imminent**
- ✓ Steady progress with earthquake-resistant urban development

Major changes in social environment

Preparation of new estimates on which to base disaster preparedness measures

Characteristics of new damage estimates

Previous damage estimates

Basically quantitative evaluations based on numerical figures such as number of fatalities

However, only a limited number of aspects can be scientifically quantified

Potential for inadequate preparations by residents and local governments due to underestimation of potential damage

New damage estimates

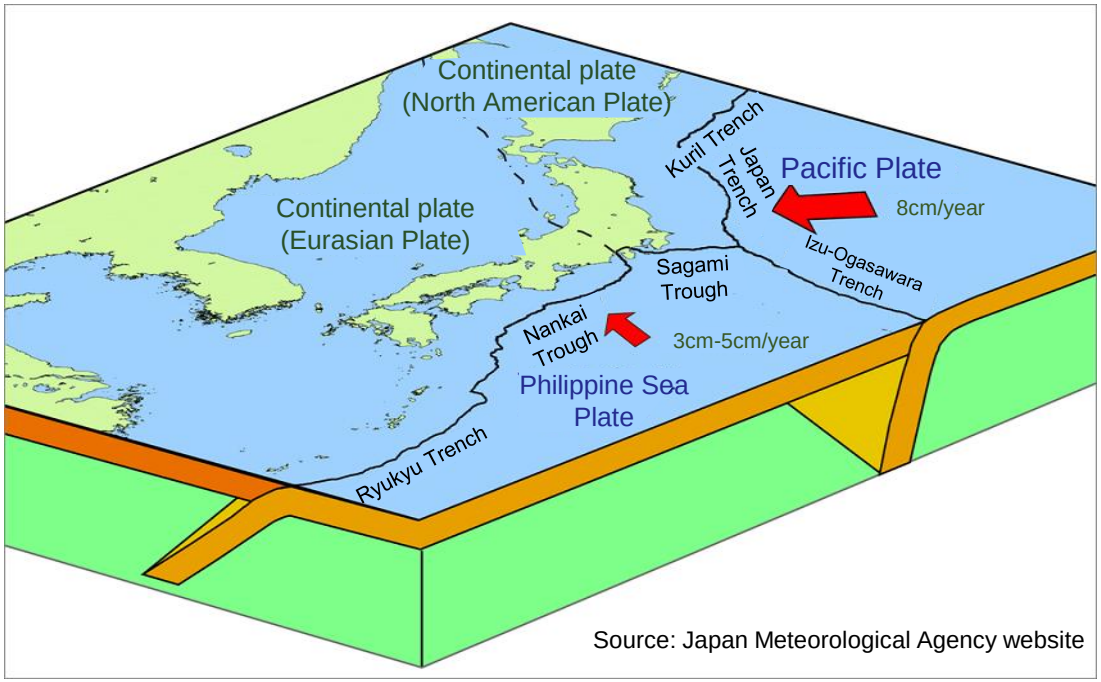
Visual representation of disaster risks

Presentation of difficult-to-quantify aspects in the form of qualitative damage scenarios

Encouraging each Tokyo resident to consider potential disasters as something that affects them personally in order to enhance their ongoing preparedness

Types of earthquakes assumed in new damage estimates for Tokyo

Tectonics plates subduct in a complex manner beneath Tokyo



Specific damage levels calculated for 5 earthquake types

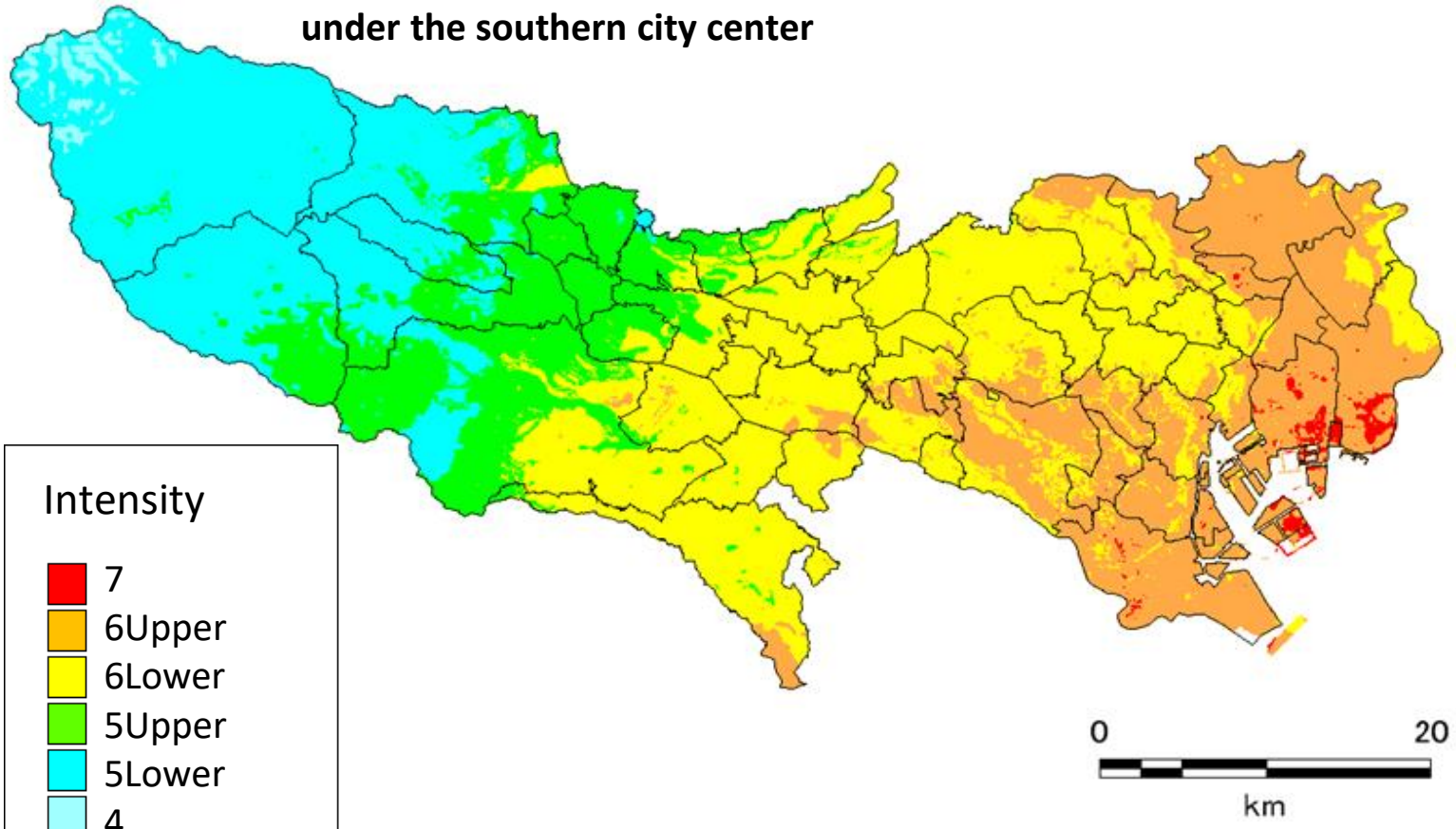
Magnitude 8 & 9 ocean trench earthquakes — 2 earthquake types

Magnitude 7 earthquakes centered on Tokyo — 3 earthquake types

Damage Estimates in Tokyo (Epicentral earthquake under southern city center)

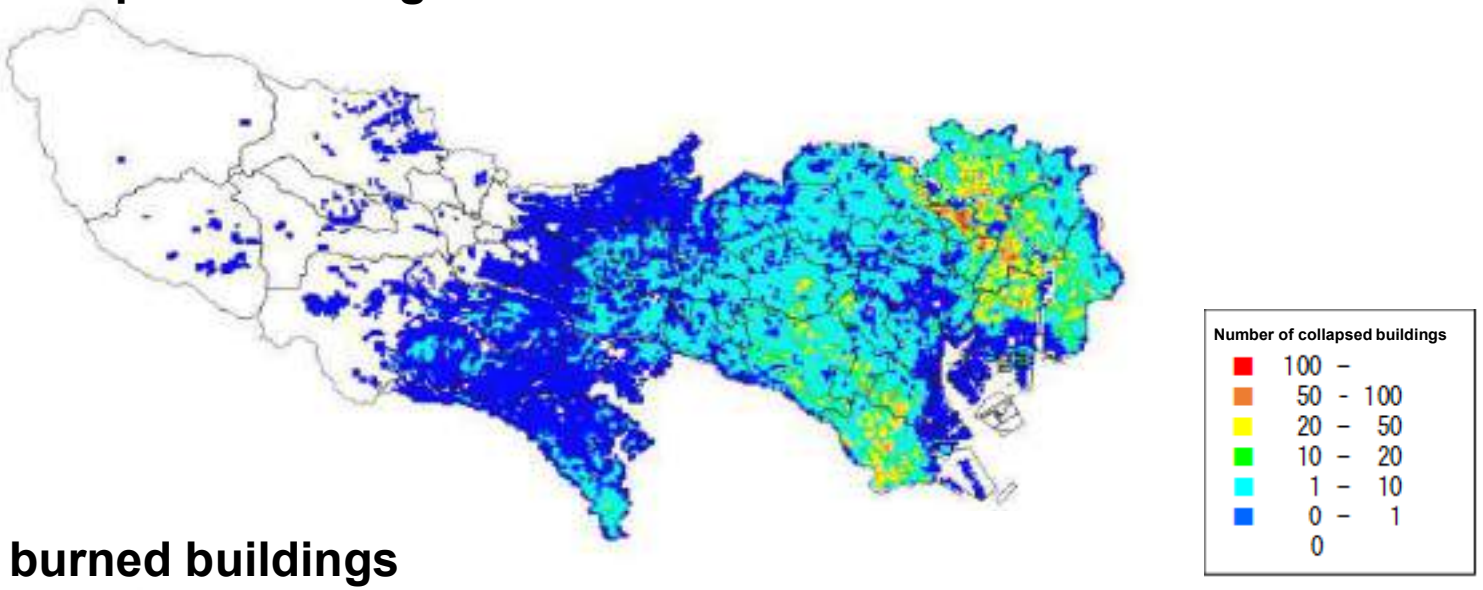
- This is an earthquake **with the maximum predicted damages within the city, with an intensity of 6 upper or greater effecting approximately 60% of city wards.**
- **194,431 buildings** will be damaged, and **6,148 deaths** are predicted.

Distribution of intensity for an epicentral earthquake (M7.3) under the southern city center

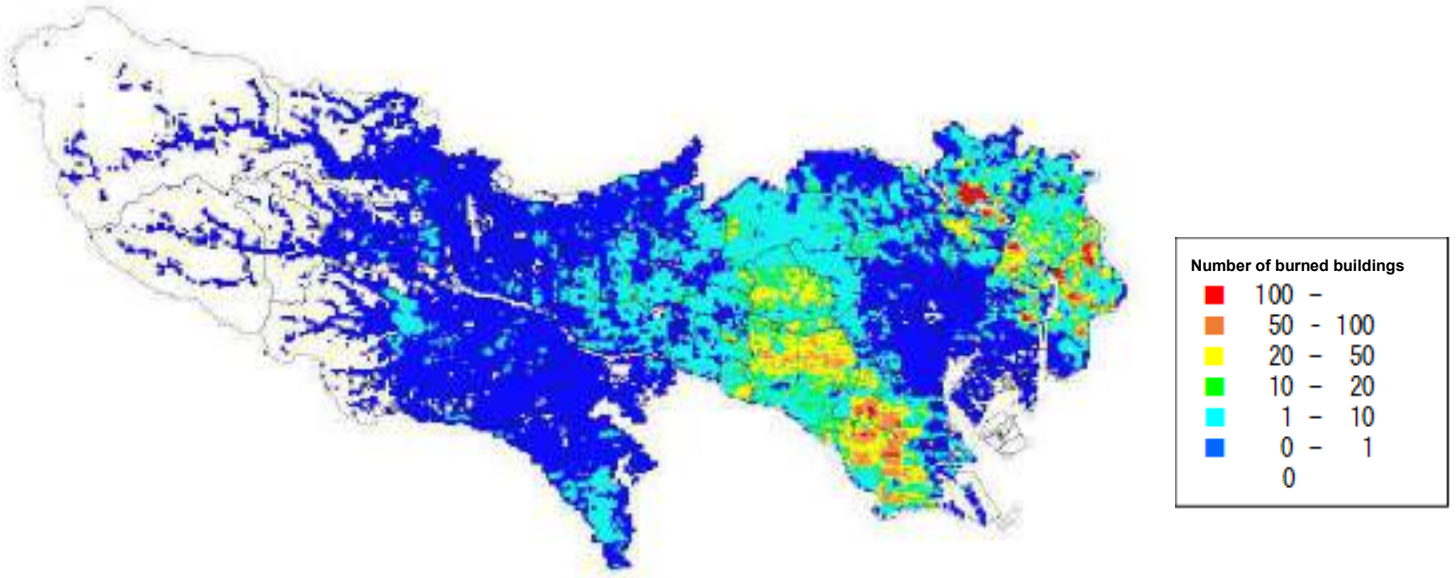


Damage Estimates in Tokyo (Epicentral earthquake under southern city center)

Distribution of collapsed buildings



Distribution of burned buildings



Comparison with earthquake in northern Tokyo Bay, which in the previous estimate was expected to cause the most damage

			Winter, evening (wind speed 8 m/s)			
Material damage	Building damage		194,431	(304,300)	Building	Approx. 110,000 less
	By factor	Shaking, etc.	82,199	(116,224)	Building	Approx. 34,000 less
		Fire	112,232	(188,076)	Building	Approx. 76,000 less
Casualties	Deaths		6,148	(9,641)	People	Approx. 3,500 less
	By factor	Shaking, etc.	3,666	(5,561)	People	Approx. 1,900 less
		Fire	2,482	(4,081)	People	Approx. 1,600 less
	Injuries		93,435	(147,611)	People	Approx. 54,000 less
	By factor	Shaking, etc.	83,489	(129,902)	People	Approx. 46,000 less
		Fire	9,947	(17,709)	People	Approx. 8,000 less
Evacuees			@ 2.99 million (@ 3.39 million)		People	Approx. 400,000 less
Stranded			@ 4.53 million (@ 5.17 million)		People	Approx. 640,000 less

※ ( ) denotes the previously predicted damages for an earthquake effecting the north of Tokyo Bay.
※ The seismic activity for an epicentral earthquake under the southern city center and an earthquake in northern Tokyo Bay will be different, and could be hard to compare.
※ Totals may not add up due to rounding to the nearest whole number.
※ Shaking, etc. includes damage from liquefaction and landslides.

Estimate of damage in Tokyo (following earthquake centered on south-eastern Tokyo)

Comparisons with past major earthquakes

	Tokyo damage estimate (published 2022)	Great East Japan Earthquake (March 11, 2011)	Great Hanshin-Awaji Earthquake (January 17, 1995)
Epicenter/magnitude	South-eastern Tokyo: M7.3	Off the Sanriku coast: M9.0	Northern Awaji Island: M7.3
Time of day	Winter 18:00 windspeed 8m/s	14:46	05:46
No. of dead/missing	6,148人 *	Approx. 18,500	Approx. 6,400
No. of injured	93,435 *	Approx. 6,100	Approx. 43,800
No. of collapsed buildings	Approx. 194,000 (including 11,000 destroyed by fire)	Approx. 127,000	Approx. 105,000
Economic damage	———	Approx. 16.9 trillion yen	10 trillion yen

* Breakdown

	Destroyed buildings	Fire	Concrete block walls, etc.	Other	Total
No. of dead	3,209	2,482	205	252	6,148
No. of injured	69,547	9,947	7,057	6,884	93,435

○ Other negative impacts - Number of people stranded in immediate aftermath: approx. 4.53 million; number of people sheltering in evacuation centers: 2.99 million

Damage prediction for Tokyo (Subduction-zone earthquake: islands)

Oshima

Toshima

Niijima

Shikinejima

Kozushima

Miyakejima

Mikurajima

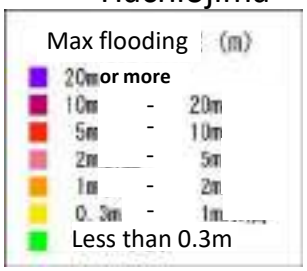
Hachiojima

Aogashima

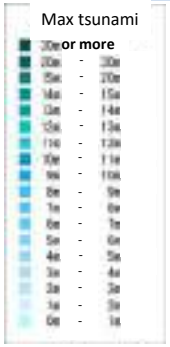
Chichijima

Hahajima

	Max Tsunami height	Arrival time
Oshima	@ 16 m	@ 23 min.
Toshima	@ 17 m	@ 19 min.
Niijima	@ 27 m	@ 17 min.
Shikinejima	@ 28 m	@ 14 min.
Kozushima	@ 27 m	@ 17 min.
Miyakejima	@ 16 m	@ 25 min.
Mikurajima	@ 6 m	@ 30 min.
Hachijojima	@ 17 m	@ 32 min.
Aogashima	@ 14 m	@ 36 min.
Chichijima	@ 15 m	@ 126 min.
Hahajima	@ 16 m	@ 108 min.



* Flooding on each island is maximum prediction



Building damage
1,258
(1,282)

Deaths
952
(1,774)

( ) Previous prediction

Damage Reduction Effects of Disaster Prevention and Mitigation Measures

(Winter, evening/wind speed 8m/s)

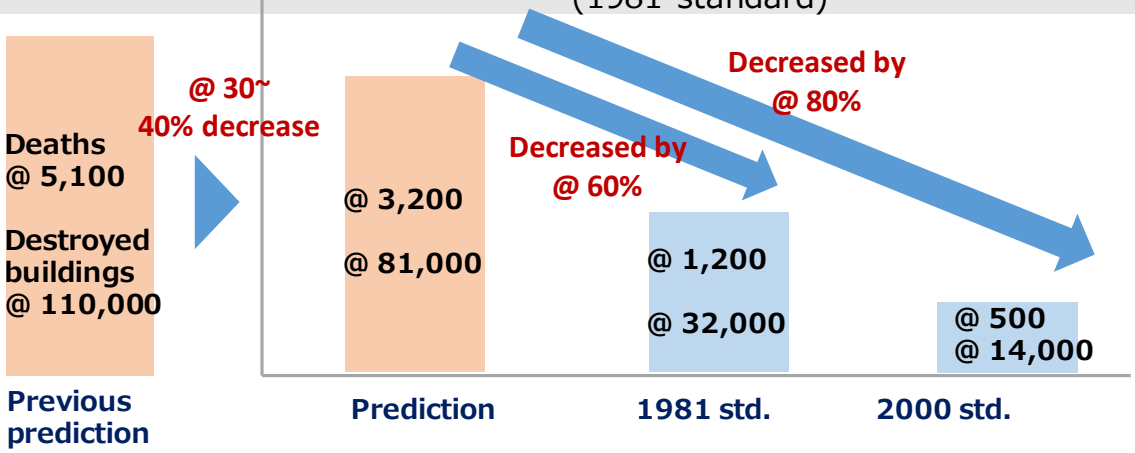
○ **Estimation of reduction in damages** due to **further promotion of measures** for building earthquake proofing

Promotion of earthquake resistance

Category	Current state	Promotion (1)	Promotion (2)
Promotion of earthquake resistance	Home earthquake resistance 92%	100% earthquake resistance (1981 standard)	2000 Standard

- 30% - 40% reduction in building destruction and deaths over previous prediction.
- Further progress in measures is predicted to **further reduce deaths and destroyed buildings**.

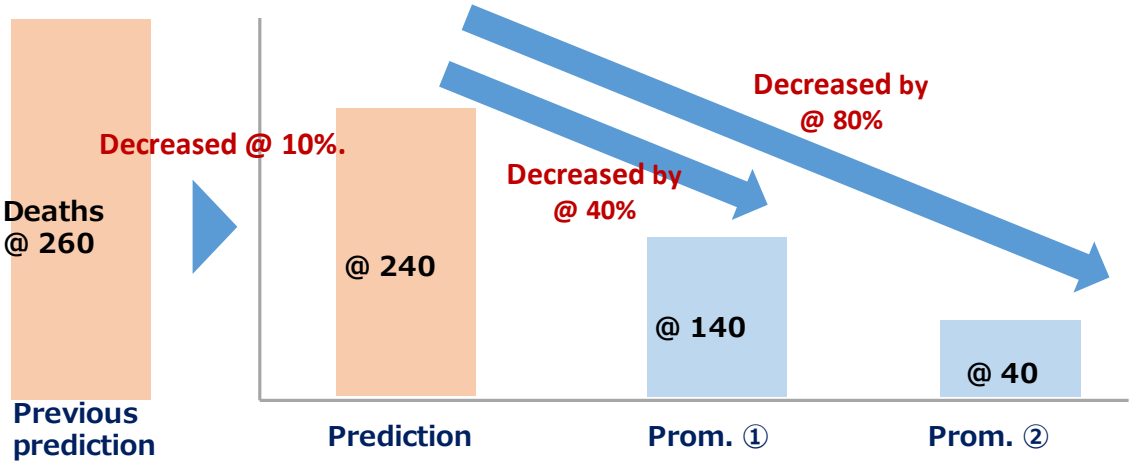
* The number of fatalities is the number of people killed by damage to buildings caused by shaking, and does not include people killed by collapsing walls, etc.



Furniture collapse prevention

Category	Current state	Promotion (1)	Promotion (2)
Increased rate of measures to prevent furniture collapse/falling	57.3%	75%	100%

- Deaths down 10% from previous prediction
- Further progress in measures is predicted to **further reduce deaths**.



Damage Reduction Effects of Disaster Prevention and Mitigation Measures

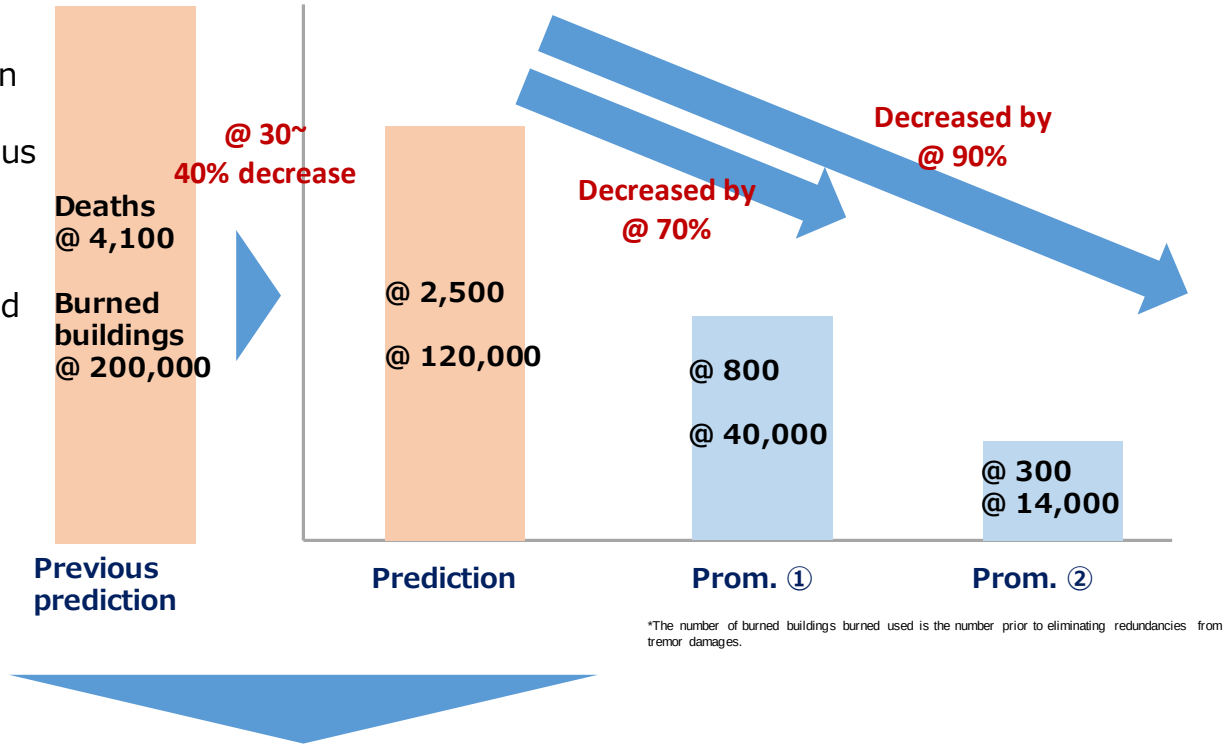
(Winter, evening/wind speed 8m/s)

○ **Estimation of reduction in damages** due to **further promotion of measures** for building earthquake proofing

Fire prevention

Category	Current state	Promotion (1)	Promotion (2)
(1) Reduction of fires caused by electricity	8.3%	25%	50%
(2) Improvement in initial fire fighting	36.6%	60%	90%

- 30% - 40% reduction in deaths, burned buildings over previous prediction.
- Further progress in measures is predicted to **further reduce deaths and burned buildings**.

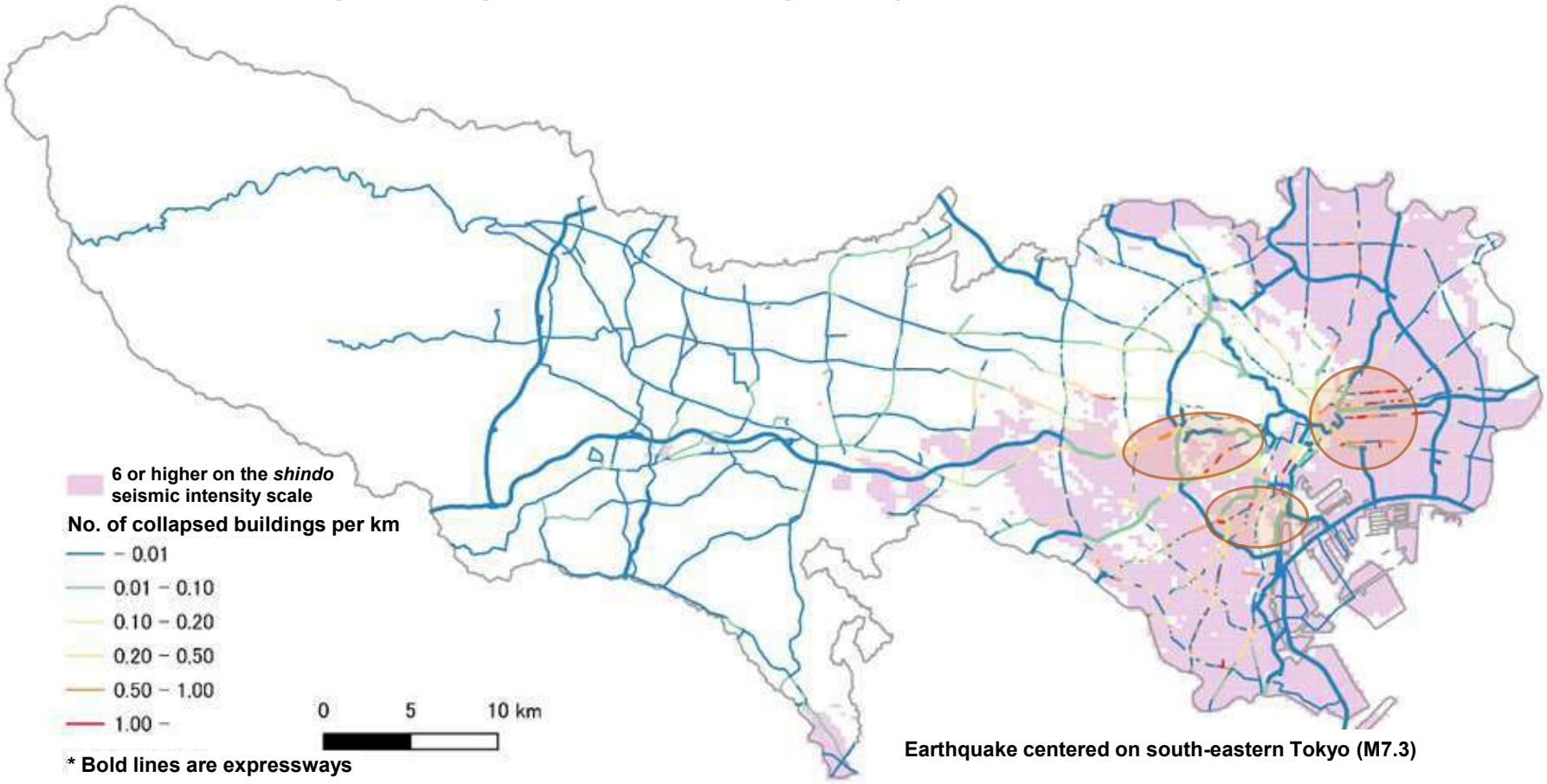


*The number of burned buildings burned used is the number prior to eliminating redundancies from tremor damages.

A significant reduction of damage can be achieved by promoting the various measures.

Traffic disruptions on designated emergency transport routes

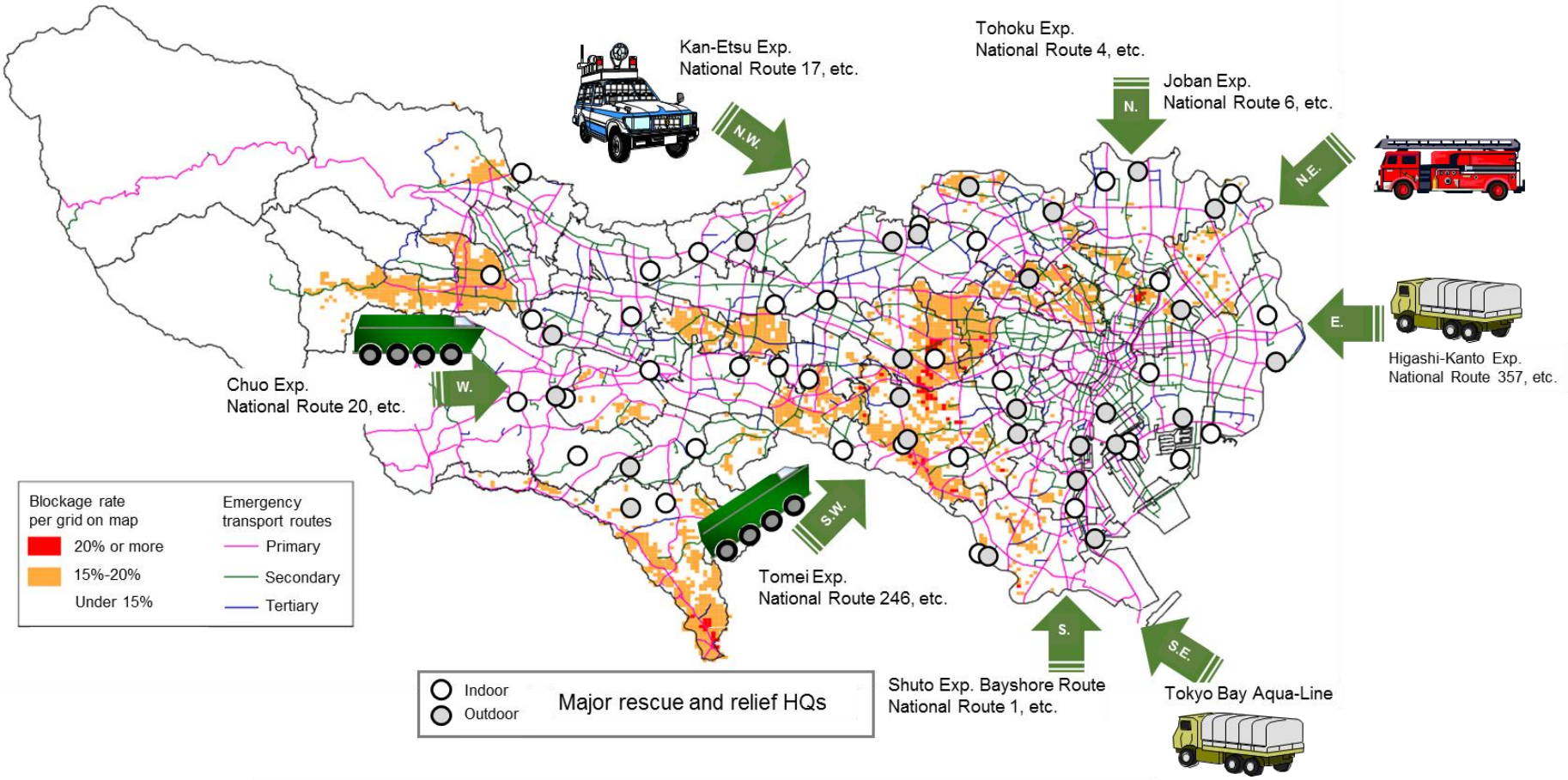
Visual representation of the risk of buildings collapsing along designated emergency transport routes



Number of collapsed buildings per kilometer along emergency transport routes

Blockage of narrow roads

Visual representation of risk of blockage of narrow roads connecting on to designated emergency transport routes and other major thoroughfares



Rate of blockage of narrow roads due to collapsed buildings

Overview of Quantitative Evaluation

Past measures have contributed to disaster risk reduction

Steady progress with seismic reinforcement, increasing fire resistance, etc. leading to clear reductions in fatalities, injuries, and physical damage

- Seismic reinforcement of housing 81.2%➡92.0%
- Percentage of urban area that is fire-resistant 58.4%➡64.0% (development areas)

Estimated fatalities
Approx. 6,100
(down by approx. 3,500)

➡As immense damage is still expected, however, further expansion and enhancement of initiatives is required

The islands of Tokyo are expected to suffer immense tsunami

It's feared that enormous tsunamis could quickly reach many of the islands of Tokyo

➡Rapid evacuation measures, and countermeasures against the kind of damage to port facilities that would lead to islands becoming isolated, are particularly important

There are concerns it may be difficult for rescue and relief units to access certain areas

Steady progress being made with seismic reinforcement of buildings along emergency transport routes, but there are districts with a high risk of blockages due to the collapse of unreinforced buildings

- **Seismic reinforcement of buildings along designated emergency transport routes** 81.3%➡91.6%

➡ Further efforts to advance seismic reinforcement of buildings along emergency transport routes is essential

Quantitative evaluation isn't necessarily persuasive to residents about how disasters could impact them personally

Present qualitative damage scenarios in addition to quantitative evaluation
and provide visual representations of disaster risk

Qualitative evaluation within the new damage estimate

Qualitative damage scenarios - Covers 50 aspects within nine different areas

Nine areas

(1) Building damage, etc. (2) Deaths, injuries, illness (3) Transport infrastructure (4) Lifelines (5) Impact on lifestyles (6) Other damage (7) Economic damage (8) Scenarios specific to each area of Tokyo (9) Compound disasters

Present five scenarios that could personally impact those affected by disasters

(1) **Efforts to restore infrastructure/lifelines**

(2) **Emergency response activities by research and relief organizations**

(3) **Daily life in emergency evacuation shelters**

(4) **Daily life sheltering in familiar places such as one's own home after a disaster**

(5) **Circumstances of those left stranded in the immediate aftermath of a disaster**

Potential disaster scenarios for Tokyo residents and the damages thereof (summary)

➢ The conditions that can occur during an earthquake organized by time from earthquake occurrence from the standpoint of city residents and related organizations.

Epicentral earthquake occurs under Tokyo

	Primary damages	Lifelines	Railroads and roads	Life at evacuation shelters	Destinations	Living environment
Immediately after earthquake ~	▼ Victims trapped in **collapsed buildings** that had low earthquake resistance. ▼ **Simultaneous fires in multiple areas** with dense wooden structures	▼ Wide ranging **interruption to lifelines** such as electricity, water, gas, and communications. ▼ Expansion of areas without communications as backup generators for cell towers run down.	▼ **Rail transport stopped** due to damage, inspections ▼ **Traffic limitations on major roads**, private cars unable to pass.	▼ Countless **evacuees mob evacuation shelters.** ▼ Possible **rapid depletion of supplies at shelters.**	▼ **Stranded travelers temporarily mob shelters.** ▼ Time spent at shelters without power generators difficult.	▼ Rapid worsening of **toilet sanitation** due to improper management.
Day three ~	▼ Potential worsening of **damages due to strong aftershocks**. ▼ **Potential electrical fires** due to shorting electrical equipment when power comes back on.	▼ **Gradual restoration of lifelines**, but **some recovery takes longer** due to damage conditions.	▼ **Delayed rescue operations** due to remaining road obstructions.	▼ Depletion of stockpile of supplies for those sheltering at home, **increase in evacuees at evac centers over time.**	▼ **Stays at temporary shelters extended** if recovery of public transportation is delayed.	▼ **Toilets unusable** in apartment buildings because **sewer pipe repairs not finished**, despite return of water service.
1 week ~	▼ **Increased risk of landslide** if heavy rains occur after earthquake.	▼ **Ongoing planned power outages** due to lack of electricity supply.	▼ Rail operations gradually recovered in some areas, but **derailments can cause further delays**. ▼ Gradual removal of **restrictions to travel** on major roads.	▼ **Increased stress and trouble among evacuees** due to lack of necessary supplies and privacy.	▼ **Crowding of people** at stations and surrounding areas when rail transport resumed. ▼ **Business continuity difficult** due to difficulty of employees reaching work location if earthquake occurs late at night or on weekends.	▼ **Lack of necessary supplies** due to excessive buying and hoarding.
1 month ~	▼ Increase in **earthquake related deaths** among elderly and those with pre-existing conditions.	▼ **Lifelines fully restored** in many areas.	▼ **Several months required to restore roads** cut off by landslides.	▼ **Reduction in evacuees** as lifelines are restored and people return to homes or temporary housing.		▼ **Delayed restoration of elevators in apartment buildings** due to requirement for inspections despite return of electrical service.

There will be many challenges in immediate daily life for the time being following the earthquake, and recovery will take longer if the damages are extensive.

- These estimated damages are just one possibility, and please note that the same damages may not occur exactly in the same way during an actual earthquake.

< Photos: Institute of Scientific Approaches for Fire & Disaster>

Revision of Tokyo Metropolitan Government Plan for Local Disaster Preparedness Measures

Basic revision approach

To protect residents from disaster risks identified in the new damage estimate we will revise the Plan for Local Disaster Preparedness Measures, a plan that will guide efforts to **fully harness Tokyo's resources to advance disaster preparedness measures**

3 main points of the revision

(1) Accelerate implementation of measures by **setting new disaster risk reduction targets**
(2) **Respond appropriately to new issues** associated with changes in social environment, etc.
(3) Work to ensure that residents, relevant organizations, etc. **share similar understanding about the nature of potential disaster damage**

Revision policy

Coordinate the direction for **12 priority disaster preparedness measures** that ought to be enhanced and made more concrete, from the perspective of preparedness/emergency response/recovery

12 priority measures

(1) Urban development involving seismic reinforcement/increasing fire resistance; (2) Securing lifelines; (3) Securing transport network; (4) Household and community disaster preparedness activities; (5) Emergency disaster response measures; (6) Evacuation of residents, procurement of supplies; (7) First-aid and health-related measures; (8) Rebuilding lives/livelihoods; (9) Smooth disposal of disaster waste; (10) Measures for people stranded in the immediate aftermath of disasters; (11) Apartment building disaster preparedness; (12) Disaster preparedness measures for the islands of Tokyo

Revision schedule

Plan revision scheduled for early 2023

Thank you very much for your attention.

CURRICULUM VITAE [Presentation overview]

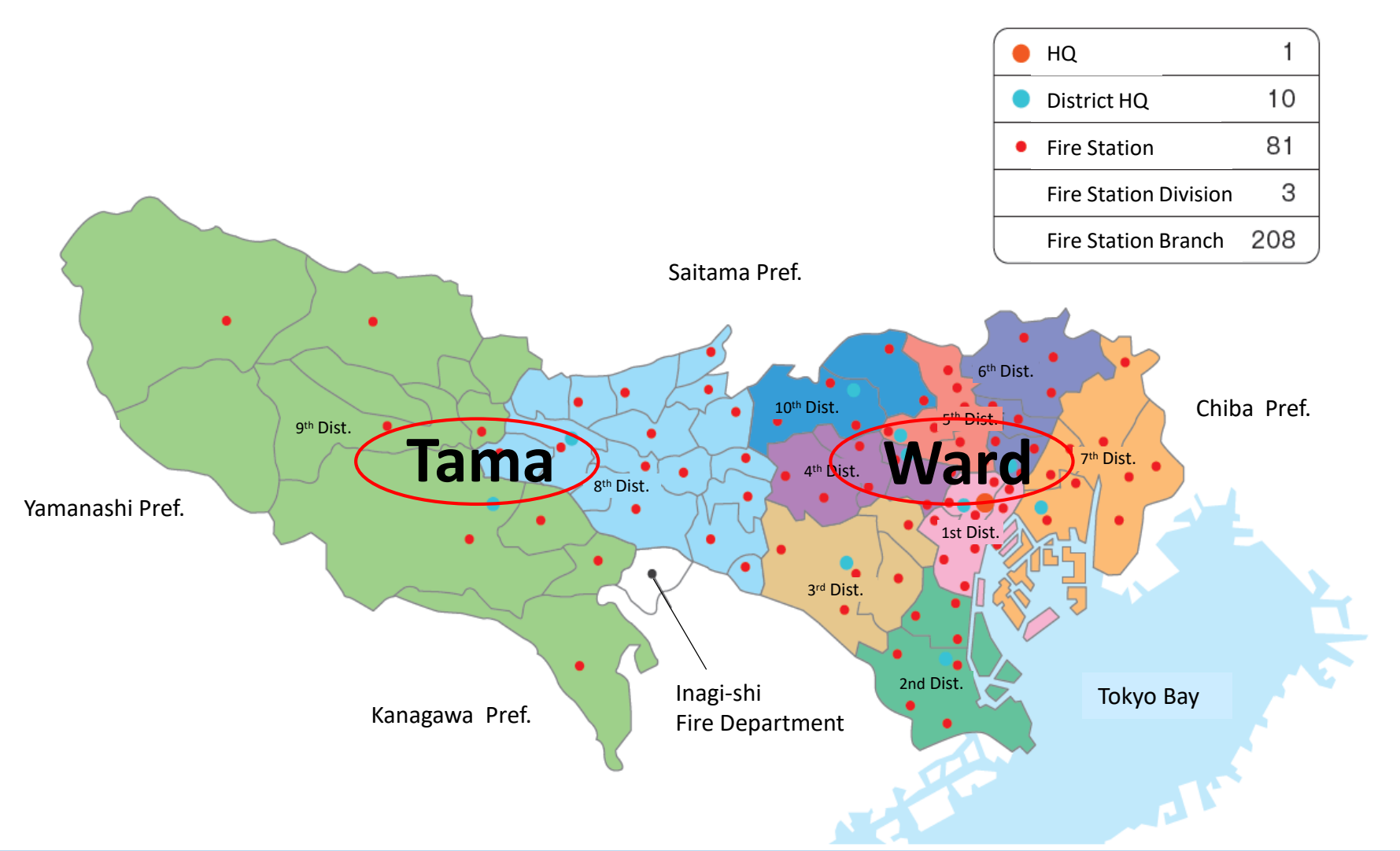
Presenter – Mr. Machida Tatsuhiko
Position – Fire Captain, Tokyo Fire Department

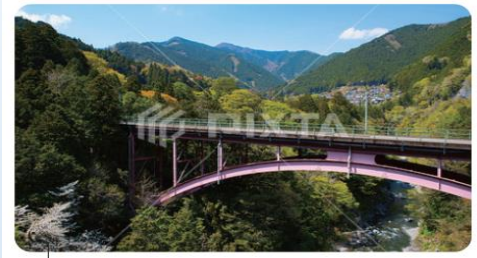
Crisis Management Conference 2022

Challenges and Countermeasures of the Tokyo Fire Department in Earthquake Disaster

MACHIDA Tatsuhiko
Fire Captain
Chief, International Affairs Branch
Administration Section
Administration Division
Tokyo Fire Department

TFD Service Area





Mountain

City

Coast

The TFD covers 23 wards, 25 cities, 3 towns and 1 village (52 in total).
Area 1769.38 km2, Population 13,726,337

Resources

Budget (JPY)	**251,067,000,000**
	(Approx. 1.8 billion dollars)
Personnel	**18,661**
Uniformed	18,238
Civilian	423

Apparatus	**2,075**

Incl. 9 Fireboats & 8 Helicopters

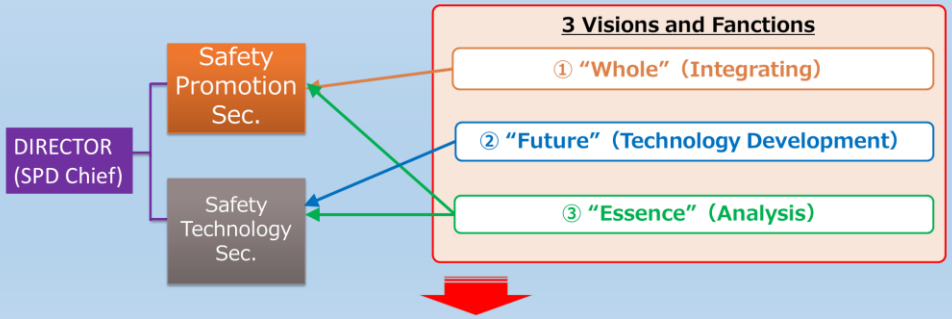
Responses

Responses in the TFD Area (2021)			
1-1-9 Calls	1,016,405	Fires	3,936
EMS Dispatches	743,726	Rescues	24,747
Fire Inspections	31,064	Fire Safety Practices	5,340 (486,875ppl.)

Latest News

Safety Promotion Division

Safety leader with "Whole", "Future" and " Essence"(First in Japan)



Seeing Accident Potentialities for Firefighters' Safety working for Citizens' Safety

Earthquake Preparedness of the TFD

【Self Help】

Promoting Life safety/ Fire Safety/ Initial Firefighting Training

【Mutual Help】

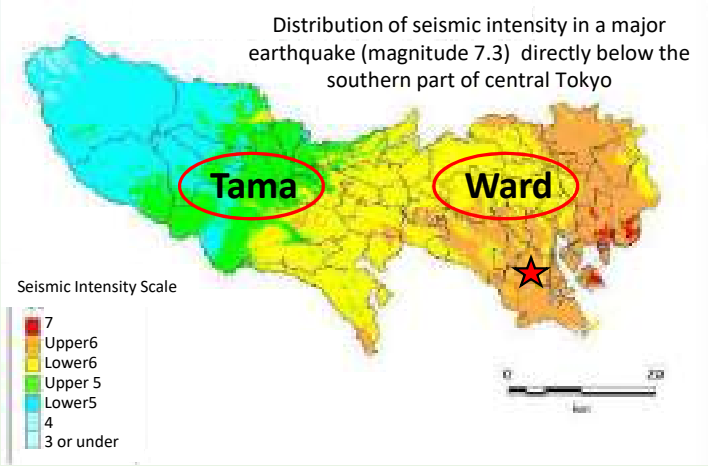
Developing Community Disaster Preparedness

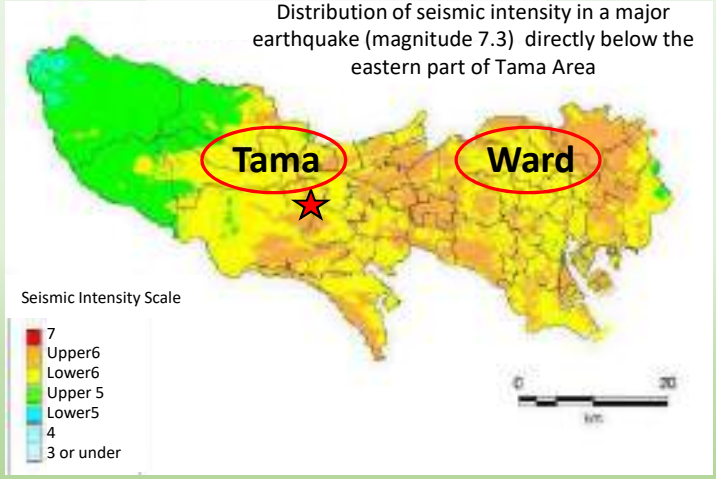
【Public Help】

Developing the Ability to Cope with Multiple Disasters

etc...

Main Points of the Estimate





Severe damage is concentrating on 2 areas.

1.Eastern Part of Ward Area
-Soft Ground
2.Southern Part of Ward Area
-Closeness to the Epicenter
-Density of Buildings and population

7 wards account for 80% of casualties.

Damage is widespread all over Tokyo.

1.Eastern Part of Ward Area
-Soft Ground
2.From western Part of Ward Area to Tama Area
-Closeness to the Epicenter

Damage by Steep slope collapse is the largest among all estimates.

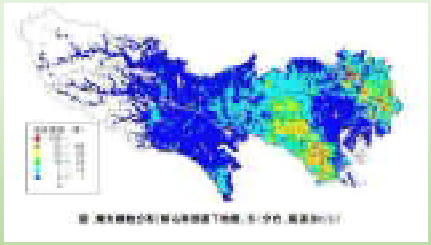
-High seismic intensity in Tama Area

Operations

Stage	Standard	Deployment
Earthquake Deployment	A/N (based on the earthquake information)	On duty personnel
Emergency Earthquake Deployment Stage 1	Above upper 5 (JSI)	On duty & required Personnel
Emergency Earthquake Deployment Stage 2	Above lower 6 (JSI)	All personnel & Volunteer fire corps members

Revised operation

Regional difference in Damage



Reinforcement of Support system

Less damage

More damage

Lack of personnel & equipment

Necessary units (gathered before request)

Challenges

【Challenge 1】 Regional difference in damage due to social & urban structure

【Challenge 2】 New aspects of damage caused by social & urban structural change

【Challenge 3】 Enormous number of buildings burnt out by multiple simultaneous fire breakout

【Challenge 4】 Huge number of 1-1-9 calls for rescue

【Challenge 5】 Expanding human damage after earthquake

【Challenge 6】 Difficulty of coping with complex disasters

Countermeasures

【Challenge 1】
Regional difference in damage due to social & urban structure
【Countermeasure】
Effective operation based on the disaster fact & local trait

【Challenge 2】
New aspects of damage caused by social & urban structural change
【Countermeasure】
Enhancing operation capability & system according to the transformation

Countermeasures

【Challenge 3】

Enormous number of buildings burnt out by multiple simultaneous fire breakout

【Countermeasure】

Further promotion of fire safety & initial firefighting training by the package of self/mutual/public help

【Challenge 4】

Huge number of 1-1-9 calls for rescue

【Countermeasure】

Rescue operation on early stage by combination of self/mutual/public help

-Community Risk Reduction & Effective rescue operation

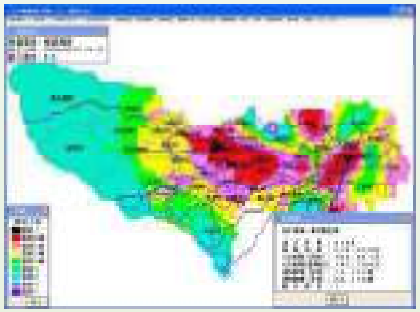
Countermeasures

【Challenge 5】
Expanding human damage after earthquake
【Countermeasure】
Improving operational resilience

【Challenge 6】
Difficulty of coping with complex disasters
【Countermeasure】
Developing the total emergency response capabilities

Outlook for devastating disasters

Enhancement of fire department strategies and on-scene operations



Sophistication of earthquake preparedness systems

Backup Trucks (Augment)

Multi-purpose Road Accessor (Augment)

Sediment disaster Remote monitoring system (deployment)

Sediment suction vehicle (deployment)

Drone (renewal)

Earthquake occurs when we forget.

-Japanese proverb-

Never forget, keep you remember!




東京消防庁
Tokyo Fire Department




CURRICULUM VITAE
[Presentation overview]

Presenter – Mr. Cheng, Cheng-Chi
Position – Specialist :Disaster Management,
Taipei City Fire Department

Disaster Relief Volunteer and Community Preparedness in Taipei City

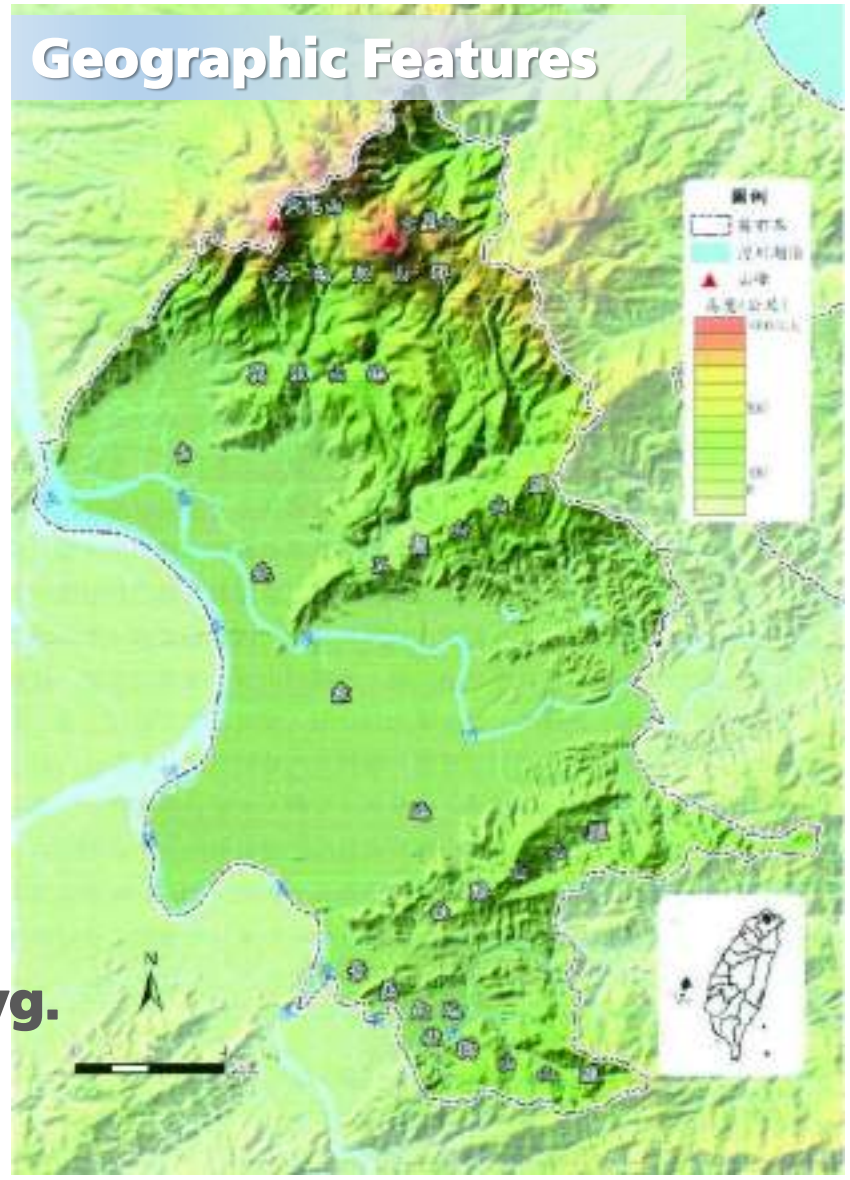
Cheng-Chi Cheng
Subdivision Chief
Office of Disaster Management
Taipei City

Hazards and their impacts in Taipei

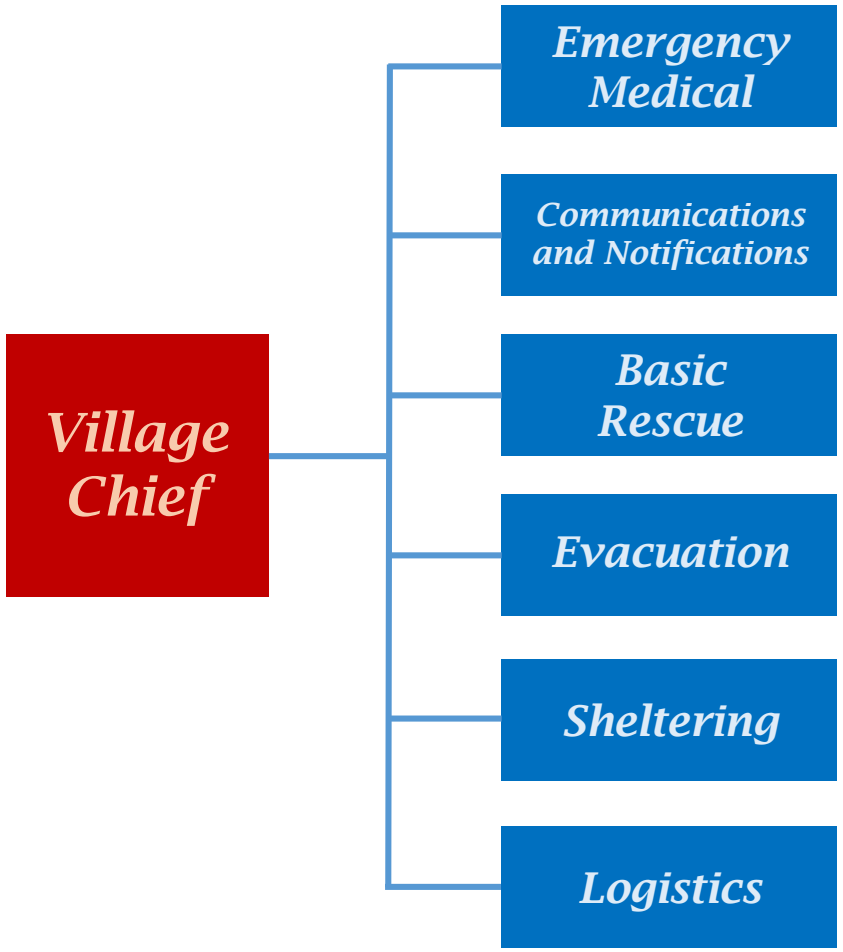
2.5 million

271 km²

23°C Avg.



How Taipei Community Disaster Response Team Operates?



- **All 456** villages has TDRT.
- Holds regular training every year.

Reinforcing potential impact communities

Landslide Hazard

Supported by

Geotechnical Engineering Office
Public Works Department of
Taipei City Government

Earthquake Hazard

Supported by

Taipei City Fire Department

Flood Hazard

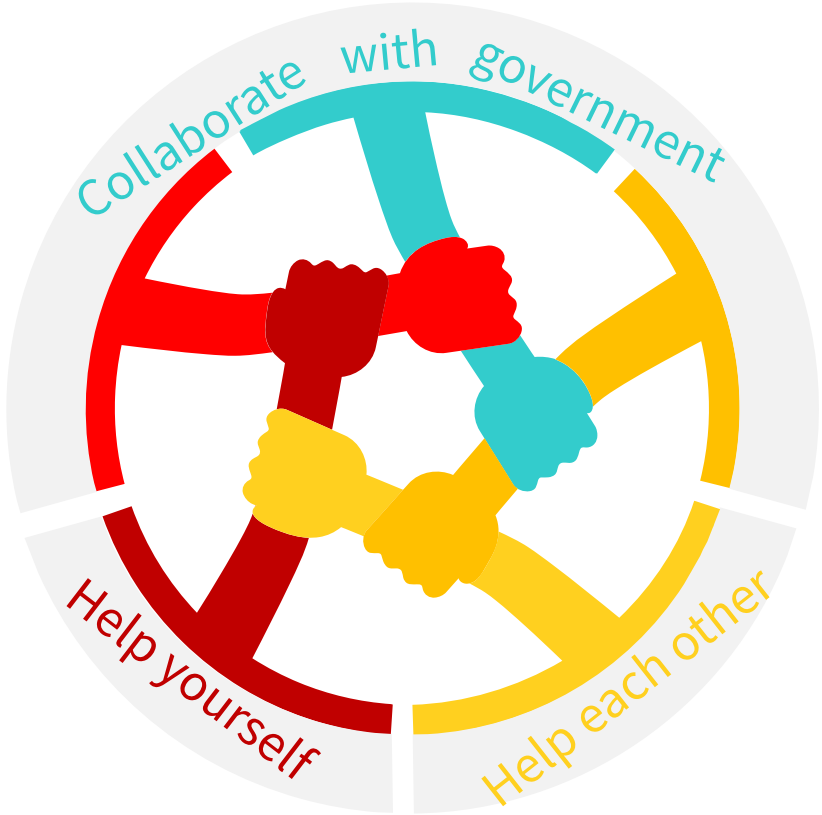
Supported by

Hydraulic Engineering Office
Public Works Department of
Taipei City Government

Certified Disaster Relief Volunteer

The bridge between government and citizens

Protect the lives and property of citizens



Trained by

1 *Government* **2** *Certified NGO*

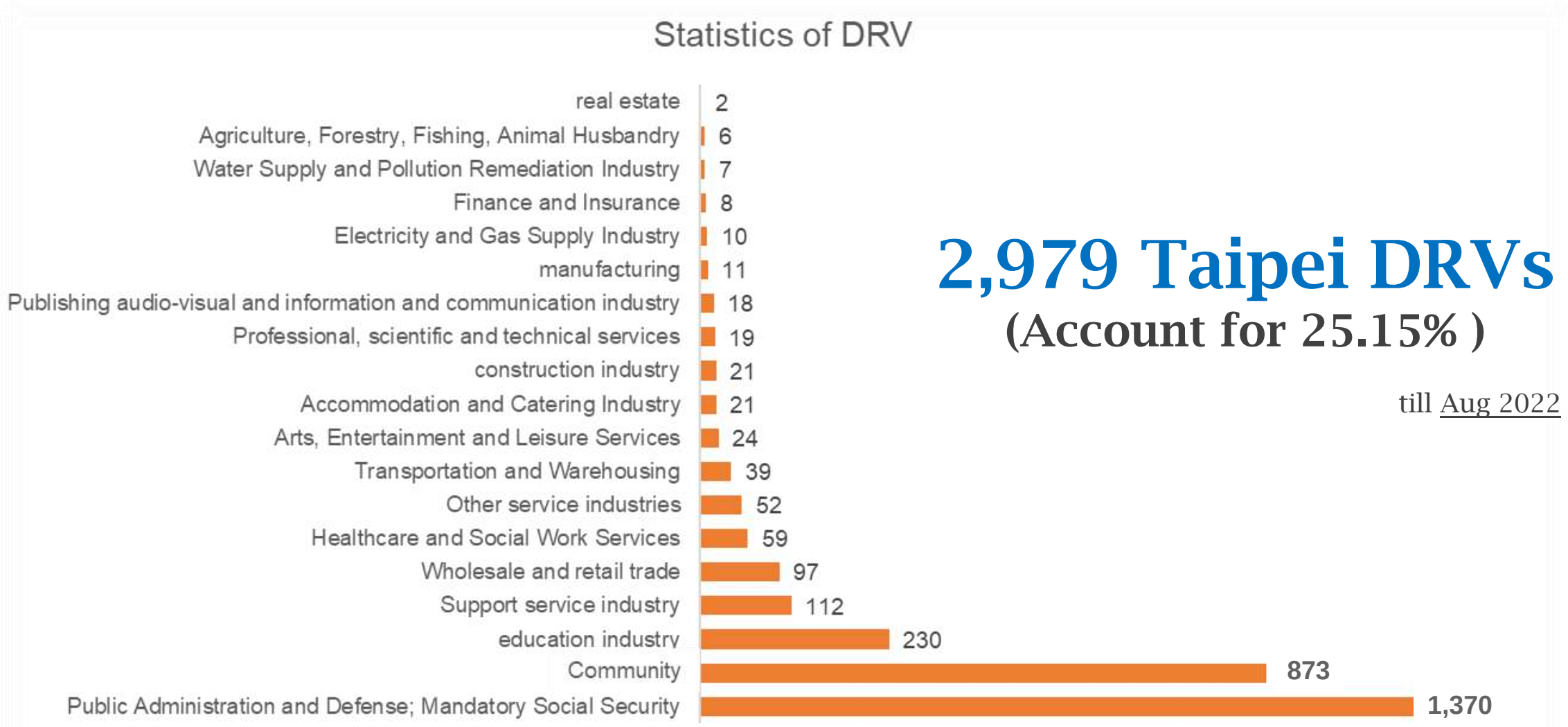
Certified by Institution

Non-Government Organization for Disaster Prevention Examination and Guidance

TIEDP 社團法人 臺灣防災教育訓練學會

The training course for DRV is about **15 hours**, including basic first aid training , implementation of first aid measures, duties and tasks of DRV, Taiwan's disaster prevention system and operation, Taiwan's recent disaster experience and disaster characteristics, information accessing and application, and community disaster prevention plan, personal protection measures (including situational exercises), community disaster prevention work promotion and operation, community shelter set up and operation, disaster prevention plan implementation and verification.
After passing the subject and technical examinations, a DRV can be certified.

Taipei Disaster Relief Volunteer (DRV) since 2019



2,979 Taipei DRVs

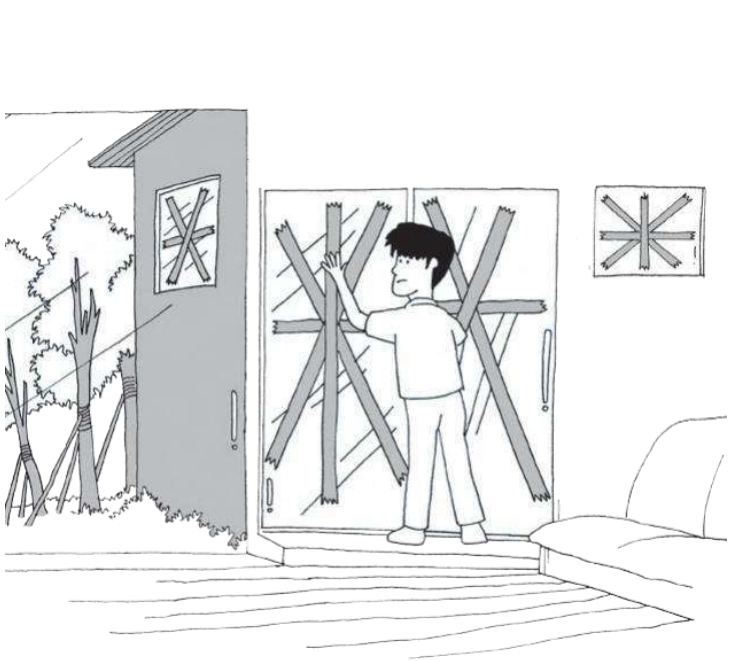
(Account for 25.15%)

till Aug 2022

Taipei Disaster Relief Volunteer (DRV) since 2019

Taipei DRV Capability

- Promoting disaster prevention propaganda and building disaster-resistant communities.
- Helping themselves and each other during and after a disaster.



Taipei Disaster Relief Volunteer (DRV) since 2019

Engage DRV in community preparedness

- Assist in shelter maintenance and operation.
- Assist people in flood prevention, tree sawing, and traffic guidance during typhoons.
- Perform Basic Emergency Medical Service.




Taipei Disaster Relief Volunteer (DRV) since 2019

Engage DRV in community preparedness

- Each village has more than 2 DRVs.
- Including the village chief and the village secretary.

Taipei Disaster Relief Volunteer (DRV) since 2019

Role of DRV during COVID-19

- Assisting in environmental disinfection.
- Assisting epidemic prevention education.

Disaster Relief Volunteer and Community Preparedness

complement and reinforce each other

Community | School | Business

Conclusion

- Disaster starts from and impacts the “local", so interaction with the community will help mobilize during emergencies.
- Based on different characteristics of different regions, people from various fields are invited to participate.
- Effective response requires comprehensive planning and coordination of all who will be involved—government, volunteer groups, private businesses, schools, and community organizations.

CURRICULUM VITAE
[Presentation overview]

Presenter – Mr. M.V. Deshmukh
Position – Director: Govt. Affairs, Maharashtra

Rapid Urbanization: A Challenge to Crisis Management

MR. MILINDKUMAR V. DESHMUKH
DIRECTOR GOVT. AFFAIRS
FIRE SAFE INDIA FOUNDATION

Fast Facts - Urbanization in India

Most Urbanized States: Tamil Nadu 43.9%; Maharashtra 42.4%; Gujarat 37.4%

3 out of world's 21 mega cities: Mumbai (19 mill); Delhi (15 mill); Kolkata (14 mill)

Large Cities: 23 in 1991; 40 in 2001
Urban Pop.: 25% of 850 mill in 1992; 28% of 1,030 mill in 2002.

Estimated Urban Pop. by 2017: 500 mill

% of Urban Residents who are Poor: About 25%
Slum Population: About 41 million in 2001

Estimated Slum Pop. by 2017: 69 mill

Densely populated cityscape

- **Urbanization is an integral part of the process of economic growth. As in most countries, India's towns and cities make a major contribution to the country's economy.**

- **Urbanization in India has expanded rapidly as increasing numbers of people migrate to towns and cities in search of economic opportunity.**

- **source** WORLD BANK REPORT

CHALLENGES

KEY CHALLENGE IN URBAN AREAS FOR FIRE DEPARTMENT

- **MIXED OCCUPANCY**

ON THE GROUND FLOOR : SHOPS

ABOVE OFFICES OR RESIDENCIES

CHALLENGES CONTD.

PROLIFERATION OF SLUMS

Slums now account for 1/4 of all urban housing.

- **In Mumbai, for instance, more than half the population lives in slums**

NARROW ROADS

HEAVY TRAFFIC

OLD & NEW CONSTRUCTIONS IN THE SAME NEIGHBOURHOOD

ROLE OF FIRE SERVICES

IN FACT, ALL OVER THE WORLD FIRE SERVICES ARE NOT ONLY EMPLOYED FOR FIREFIGHTING BUT ALSO FOR RESCUE OPERATIONS AS AN EMERGENCY RESPONSE SERVICE.

DEFICIENCY IN FIRE SERVICES

1

Fire Stations

2

Fire Fighting and Rescue Vehicles

3

Fire Personnel

- **Source 13th finance commission**

Shortcomings in the Present System

- LACK OF UNIFIED FIRE SERVICES IN SOME OF THE STATES: UNIFIED FIRE SERVICES PROVIDE ALL THE NECESSARY GUIDELINES AND INSTRUCTION IN FIRE FIGHTING.
- PROPER ORGANISATIONAL STRUCTURE, TRAINING AND CAREER PROGRESSION FOR PERSONNEL LACKING IN MOST OF THE FIRE DEPARTMENTS IN INDIA.
- INADEQUATE MODERN EQUIPMENT AND THEIR SCALING, AUTHORIZATION & STANDARDIZATION;
- APPROPRIATE AND ADEQUATE FUNDING NOT AVAILABLE, INHIBITS TECHNOLOGICAL PROGRESSION FOR FIRE FIGHTING.

Shortcomings in the Present System CONTD.

- LACK OF INFRASTRUCTURAL FACILITIES FIRE STATIONS & ACCOMODATION
-
- LACK OF UNIFORM FIRE SAFETY LEGISLATION IN SOME OF THE STATES
- PUBLIC AWARENESS (DO'S & DON'TS),REGULAR MOCK EVACUATION DRILLS NOT CONDUCTED
- VULNERABILTY ANALYSIS NOT DONE

OUR URBAN SPACE & PECULIARITIES

DUE TO INEFFECTIVE TOWN & COUNTRY PLANNING ;CITIES ARE GROWING VERTICALLY

THIS HAS LEAD TO SKYSCRAPERS DOTTING THE CITY LANDSCAPE.

THOUGH HIGH RISES ARE CONSIDERED A CHALLENGE BEFORE FIRE SERVICES ; LOW RISE HIGH DENSITY & SLUM COLONIES TOO POSE A SERIOUS CHALLENGE TO THE FIRE SERVICE.

SUGGESTIONS & SOLUTIONS

FIRE PREVENTION IS BETTER THAN FIRE FIGHTING

FOR LIFE SAFETY ;FIRE PREVENTION IS THE SOLE ALTERNATIVE .

OBSERVANCE OF NATIONAL BUILDING CODE TO BE MADE MANDATORY

UNIFIED FIRE SERVICES

FIRE RESISTANCE MATERIALS USED FOR CONSTRUCTIONS TO BE AS PER STANDARDS AND HAVE INDEPENDENT CERTIFICATION.

SUGGESTIONS & SOLUTIONS

CONTD.

ALL NEW CONSTRUCTIONS SHOULD HAVE

EFFECTIVE FIRE ALARM SYSTEMS WITH NOTIFIERS

EFFECTIVE SELF ACTUATED SPRINKLER SYSTEMS

DUAL STAIRWAYS & FIRE LIFTS

REFUGE AREAS FOR SPEEDY EVACUATION

SUGGESTIONS & SOLUTIONS

- TO NEGOTIATE TRAFFIC AND NARROW AND CONGESTED ROADS
- INNOVATIVE USE OF RAPID INTERVENTION VEHICLE AS FIRST FIRE RESPONDER.

URBANISATION IS INEVITABLE

- COMPREHENSIVE TOWN & COUNTRY PLANNING AND EFFECTIVE LAND USE IS THE KEY
- CRITICAL INFRASTRUCTURE LIKE ROADS , WATER SUPPLY ,MASS TRANSIT SYSTEM NEEDED TO DEAL WITH FIRE AND LIFE SAFETY .
- SUSTAINABLE QUALITY OF LIFE AND URBAN CENTRES TO BE ECONOMIC GROWTH DRIVERS

Thank You

DAY - 02:
CHALLENGES TO FIRE AND EMERGENCY SERVICE RESPONSE IN WAR LIKE SITUATIONS AND PREPAREDNESS TO DEAL WITH SUCH SITUATIONS

CURRICULUM VITAE
[Presentation overview]

Presenter – Dr. S.K. Tomar
Position – Dy. Chief Fire Officer, Delhi Fire Service

Challenges to Fire and Emergency Service Response in War Like Situations

Dr. SANJAY KUMAR TOMAR
MI Fire (U.K.), MBA (DM), I Dip NIBOSH
Dy. Chief Fire Officer
Delhi Fire Service

Introduction

- Warfare is a special category as it is planned with goal of action or intended to damage.
- Attack on vital installations and emergency services.

Source: Stock Photo Mumbai Taj Hotel terror attack, 28.011.2008

Accessibility

Access to fire services is severely impacted due to attack on roads, bridges etc.

- Blast on Kerch bridge link to Crimea bridge, Russia

Source: telegraphindia.com/amp

Rescue of trapped people

- Reaching upto the trapped people/victims due hardest hit areas as continuing on attack of missiles, bombs etc.
  - 26/11 terror attacks on Mumbai Taj Hotel

Source : Deccan Chronicle, 27.11.2022

Rescue of trapped people Contd..

As the war continues, fire engines, fire stations and equipment are lost, with a number of firefighters loose their lives.

- Firefighters work to put out a fire in a residential apartment building after it was hit by shelling as Russia's invasion of Ukraine.

Source-Marko Djurica / Reuters, 15 March, 2022.

Rescue of trapped people Contd.

As high rise apartment blocks are struck and neighborhoods are bombarded, they have to work out the multiple burning homes to priorities. Whom to rescue first?

Another question to firefighter?

How to tackle fires spread in kilometers at the same time?

Source- Twitter, 02.03.2022

PPEs for Fire fighters such as Bullet proof jacket, helmet etc.

Standing tall doing their jobs on the front lines as Army personnel, Fire Fighters are also required bullet proof PPEs

- Firefighters climb a ladder while working to Rescue trapped guest in Hotel Taj while terrorist continuing bullet firing Mumbai attacks 26/11/2008.

Source: India Today, 27.11.2008

Hostile Crowd

- Roads are blocked/damaged.
- Damage to fire fighting equipments.
- Injury to fire personnel.

➢ East Delhi riots.

Source: https://www.opindia.com/2020/02/delhi-riots

Hostile Crowd Contd..

Source : the newsmen, 16.03.2021

Source: livelaw.in/amp/news

Communication Failure

- Communication gap among all stakeholders.
- Failure of coordination with other stakeholder.
- Delay in speedy rescue .
- Supply of additional resources hampered.

➢ Russia TV tower destroyed in war.

Source: https://www.facebook.com/photo/?

Non availability of water resources

- Water resources for fire fighting are damaged due to continue bombing.
- Water pipeline destroyed in Ukraine War

Source: bbc.com/news, 25.10.2022

Specialized Training to Firefighters for War like situation

- Fire fighters are required to impart special training i.e. Firefighting during war like situation.
  - ➢ Firefighters climb a ladder while working to extinguish a blaze in a destroyed apartment building area bombing in a residential area in Ukraine,

Source : KYIV, Ukraine Mar 18,2022,

Hostage Situation : Terror attack

- Guests using curtains to escape from the Taj Mahal Palace hotel, Mumbai during the siege.

Source: AFP via Getty Images, 28.11.2022

Conclusion

1. There is no system of rules about the correct way to act in War like situations.
2. Standard operating procedure can not be followed.
3. Firefighters are not trained for such situations.

Source: Jagran TV, 04/05/2022

Thanks

CURRICULUM VITAE
[Presentation overview]

Presenter – Dr. H.K. Dangi
Position – Professor: School of Economics,
Delhi University

USE OF MODERN TECHNOLOGY IN FIRE SAFETY AND EMERGENCY SITUATIONS

Dr. H K Dangi

FIRE SAFETY

- New Delhi: A major fire broke out in a five-star hotel in vasant kunj on 25 june 2008 and nearly 250 guests, including foreigners, had to be evicted. A fire service official suffered some injuries, while the guests and hoel staff managed to escape unhurt.
- In a similar incident in 1986, 39 people, including guests and fire safety officials lost their lifes in a fire at Siddharth Hotel, now called Vasant Continental in Vasant Vihar.
- On June 8, 2007, a 31-year –old French national died and two others were injured when a fire broke out at Hotel Regalia in Chitranjan Park.
- **54.40% of forests in India are exposed to occasional fires, 7.49% to moderately frequent fires and 2.40% to high incidence levels while 35.71% of India's forests** have not yet been exposed to fires of any real significance.

MODERN TECHNOLOGY IN FIRE SAFETY

- Intelligent use of technology in fire fighting as well as fire detection is helping worldwide in saving many lives.
- Initiation of SMS alerts on number of forest fires in State/District
- Firemen can fight fire from safe distances without risking their lives by using robots for fire fighting.
- Techniques like computer vision, machine learning, and deep learning can help the front line workers to make more informed decision in a stressful situation.

USING ROBOTS IN FIRE FIGHTING

- The Delhi government has inducted two robots into the city's firefighting fleet.
- Robots imported from Australia joined indian firefighting fleet on march 15, 2022 and has also been proven effective in Mundka and Bawana fires.
- These robots can be used from a distance of 300m, minimizing risk for firemens.
- They can also provide information about people trapped inside so that strategic plan to rescue them can be made.
- Can also be used in high rise buildings or suffocating situations without risking human lives.

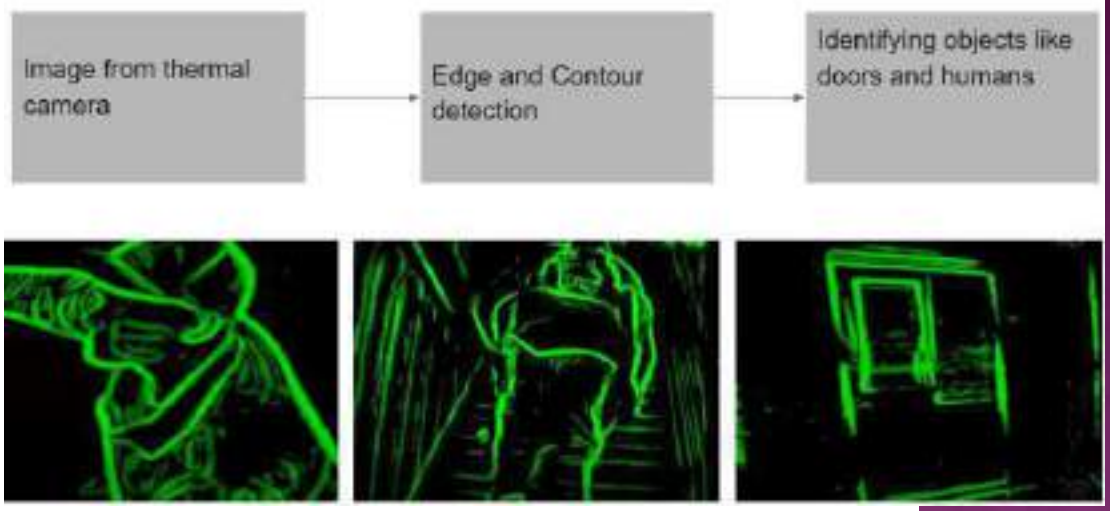
ROBOT BEING USED FOR FIREFIGHTING

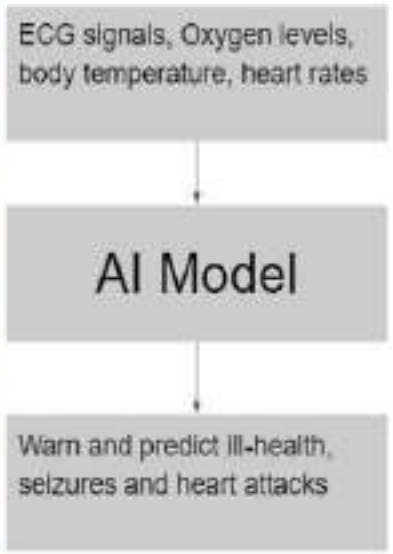
According to the National Fire Protection Association, there were 29,130 injuries reported while fighting fire in 2015. These injuries are also coupled with 68 on-duty deaths. These deaths are somehow avoidable by using Robots on frontline.

HOW AI CAN HELP IN FIRE AND EMERGENCY SITUATIONS

- A common problem faced by the fire officials when a rescue operation is underway in a place that has engulfed with flames and smoke is poor visibility.
- To solve this issue, a simple computer vision technology is employed. By mounting a camera on top of the helmet, data from the camera is used to enhance the vision of the fire officials.
- Apart from vision-related problems, the heat from the flames can cause suffocation, seizures, and even heart attacks.
- Sensors like oxygen level detectors are used to check if the oxygen level of the firefighter is in the normal range. ECG sensors can understand the extent of physiological arousal that someone is undergoing to better infer about someone's psychological state.

- AUDREY strands Assistant for Understanding Data through Reasoning, Extraction, and synthesis. It is an AI solution developed by NASA.
- Using artificial intelligence, AUDREY can collect data on temperatures, gases, and other danger signals and guide a team of first responders safely through the flames.
- Therefore, AI has an enormous potential to grow in the domain of fire and safety. These are just a few applications that can be employed to protect the environment and the lives of the people from a mishap





USING DRONES TO MAXIMIZE EFFECTIVENESS

- The Australian-owned company will provide ANU and ACT RFS with autonomous scout drones to assist with research into effective methods of early detection of bushfire ignitions.
- Drones provide cheap access to aerial data that can be used to acquire situational awareness in the event of a fire.
- Drones can also carry different sensors; one sensor that is used often is the IR sensor, which helps firefighters to identify hot-spots and even trapped people inside a structure.
- Firefighters use drones after extinguishing the fire to survey the scene, collect relevant information, and turn it into 3D maps, which serve as a record of the post-fire scene.

- MUMBAI: The city's **fire** brigade is in talks with companies to buy '**fire-fighting drones**'.
- The Karnataka Forest Department is adding a **Cessna C-188** aircraft and drones with thermal sensors to its arsenal to deal with forest fires.
- **The Odisha Fire Services may use drones for firefighting.**


Thank
you

CURRICULUM VITAE
[Presentation overview]

Presenter – Mr. Cheng, Yu-Lun
Position – Chief: New Taipei City
Government Fire Department

Emergence Data Platform for Smart Disaster Prevention

2022.11.8

新北市政府
New Taipei City Government

Natural Disaster on A Global Scale

EM-DAT, The International Disaster Database (2019)

- In 2019, 361 major natural disasters occurred, a total of 11,719 people were killed, 91.29 million people were affected, and the total economic loss was US$121.8 billion.
- The disaster-stricken areas are the worst in Asia, followed by Africa.

World Bank Group, WBG (2015)

Natural Disaster Hotspots: A Global Risk Analysis

•Taiwan' s land area and population at risk of 3 more natural disasters are both at 73%, ranking first in the world.

Economic and Social Commission for Asia and the Pacific, UN ESCAP (2018)

- Natural disasters will cost the Asia-Pacific region more than US$160 billion annually by 2030.

UNDRR

The United Nations Office for Disaster Risk Reduction, UNDRR (2021)

- Floods in the Europe have highlighted the necessity for investment in disaster management.

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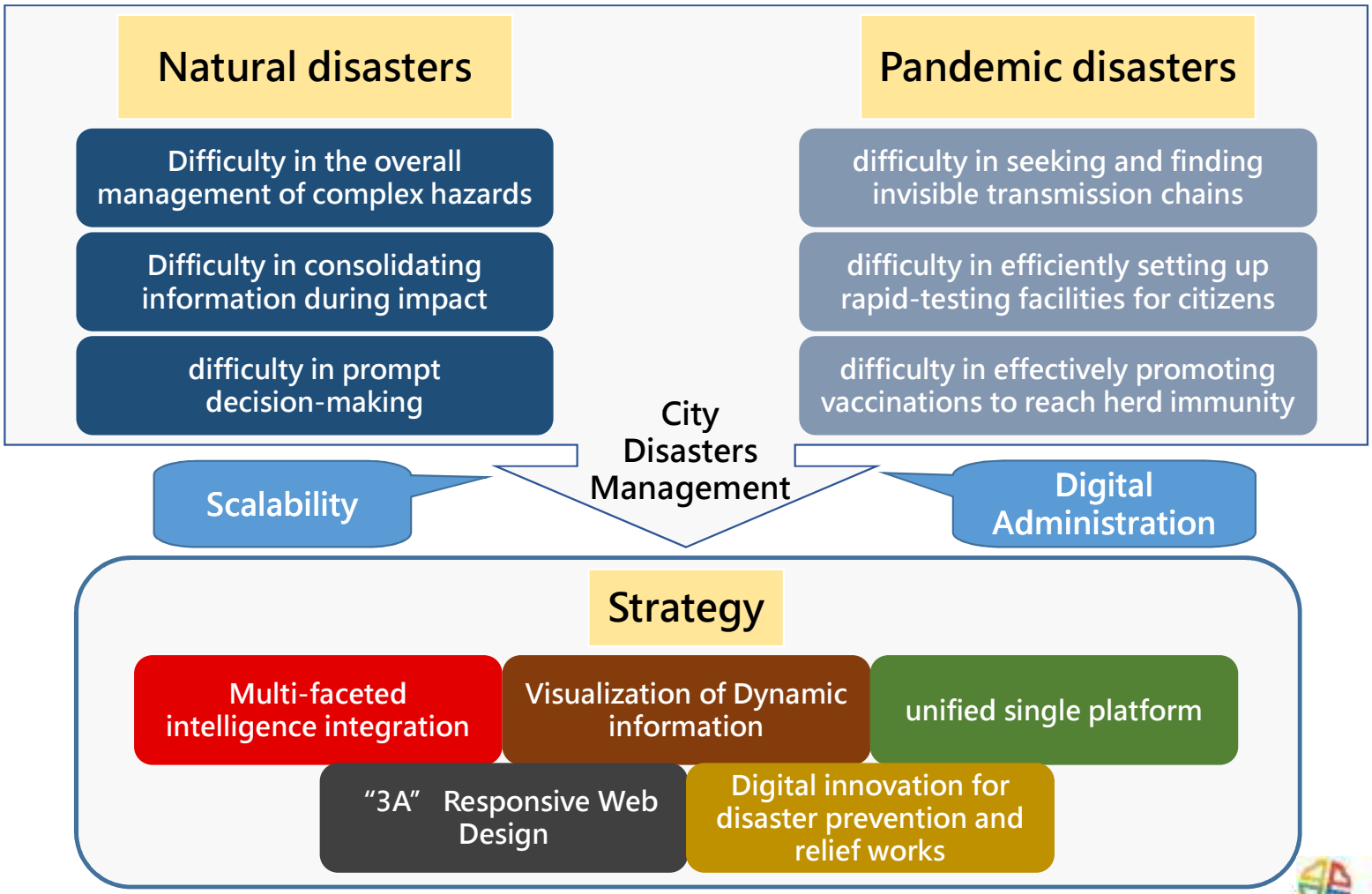
Intelligent Eoc Smart NTPC

Emergence Data Platform



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Multi-faceted intelligence integration

90+ disaster monitoring data

96+ government sectors served

14,000+ CCTV (from central/local)

40,000 cases tracked

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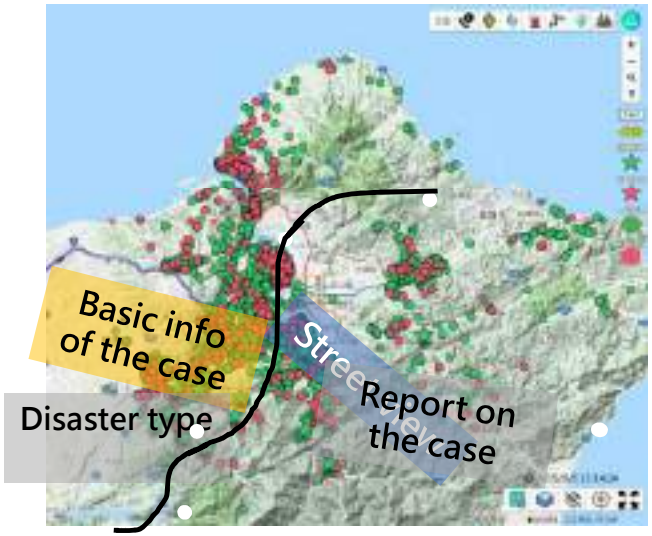
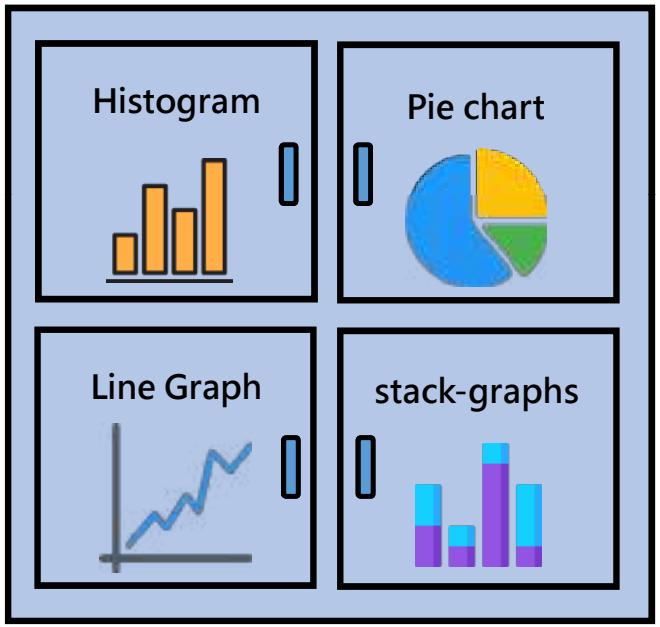
Visualization of Dynamic information

Visualization



Interaction



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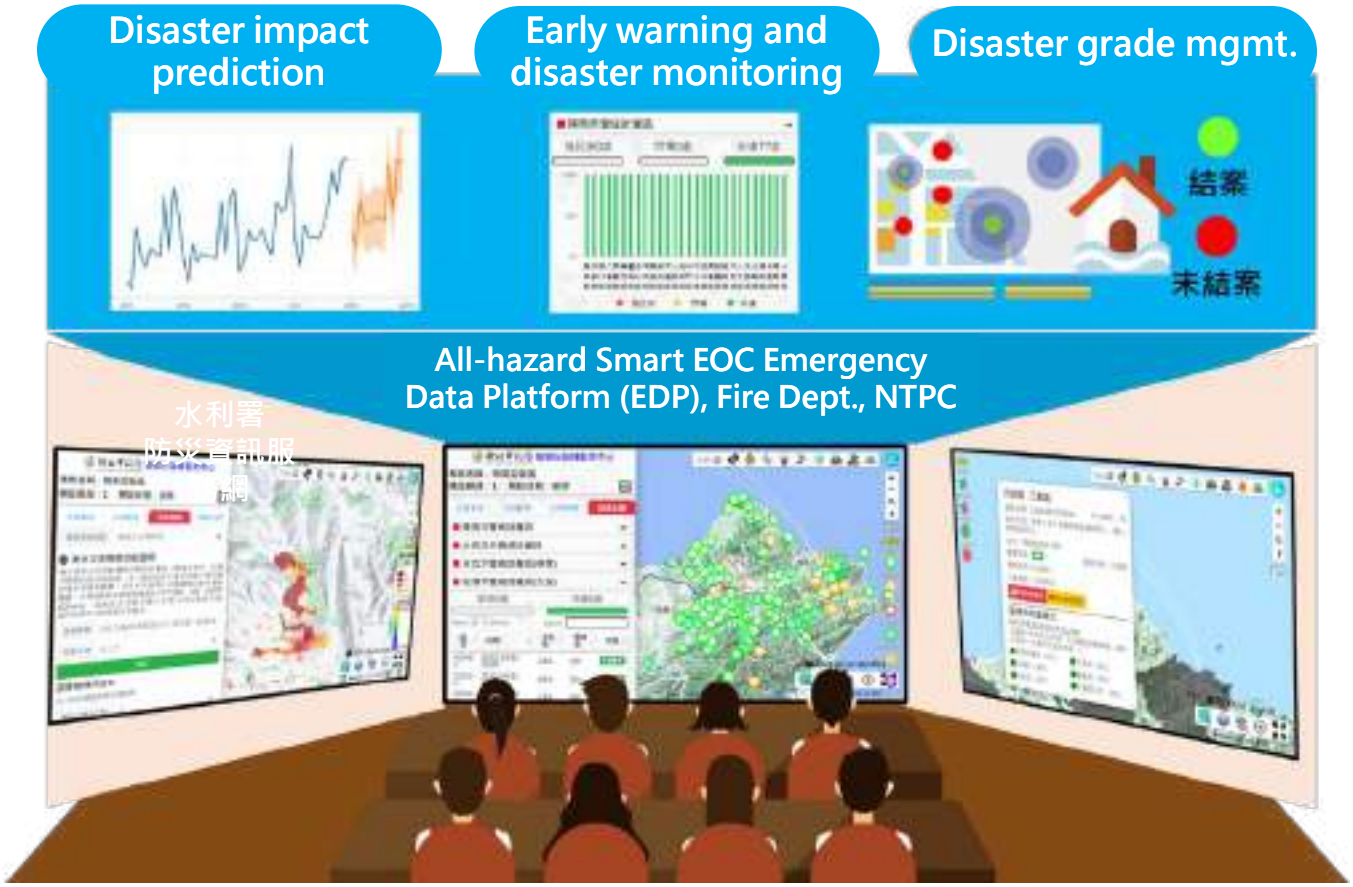
Intelligent Eoc Smart NTPC

Emergence Data Platform

Unified single platform



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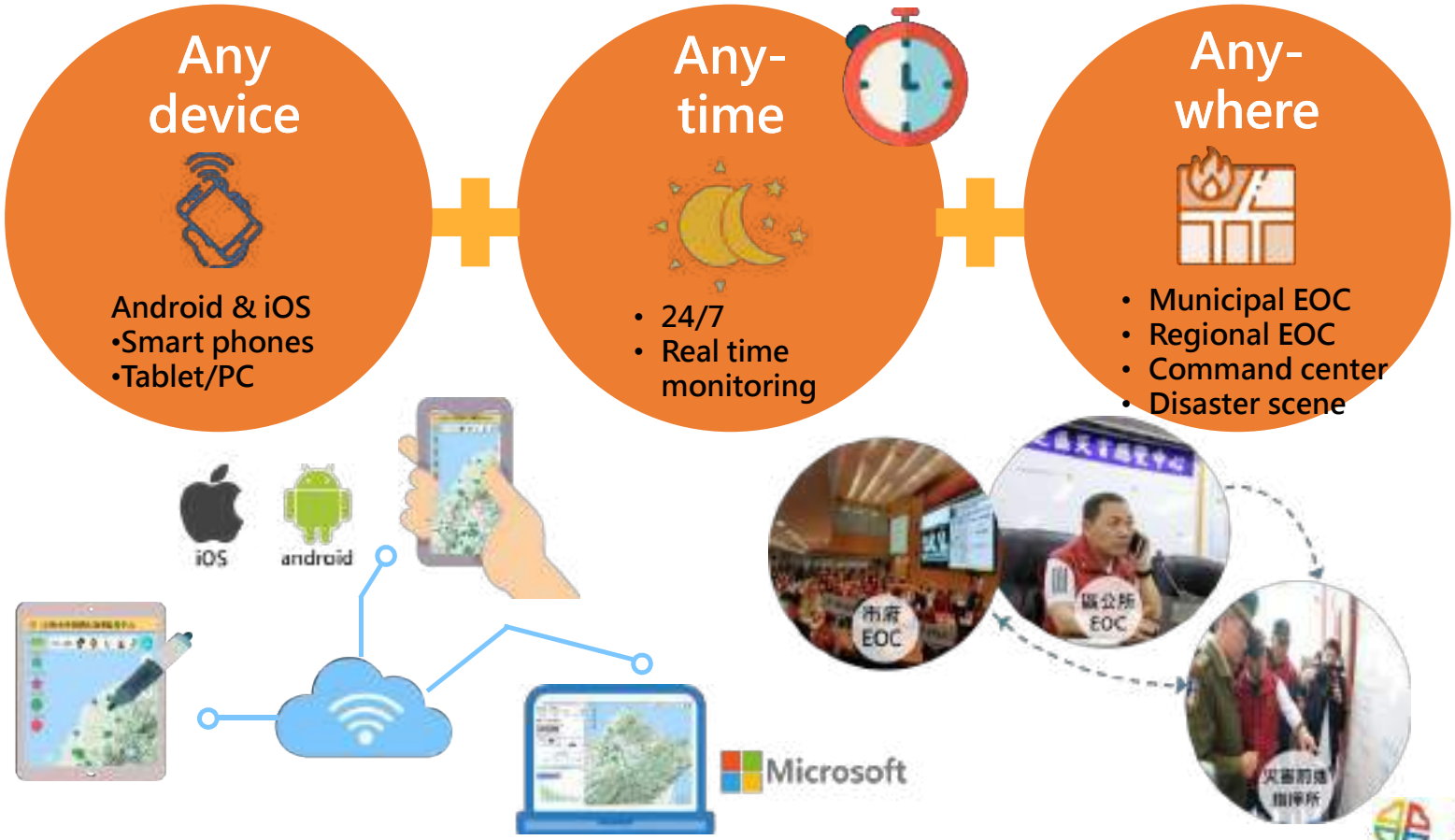
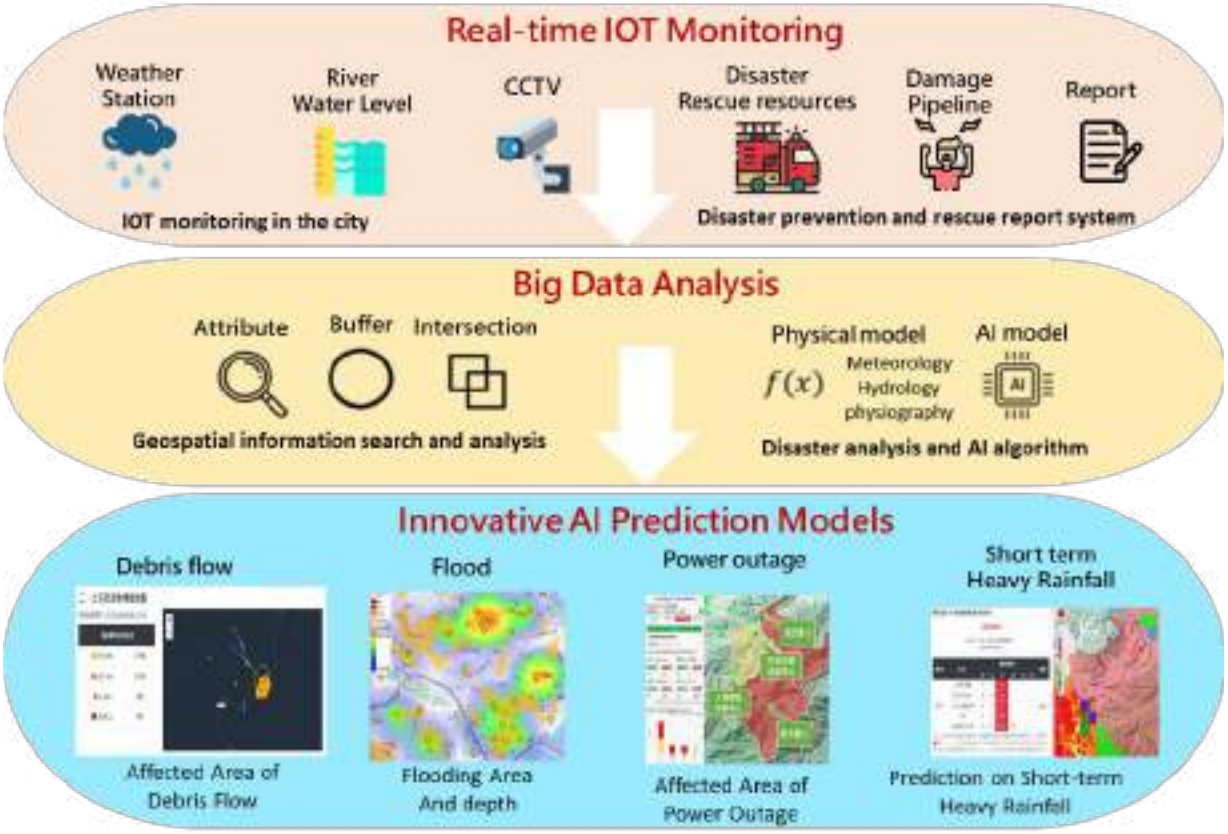
Intelligent Eoc Smart NTPC

Emergence Data Platform

“3A”Responsive Web Design



Digital innovation for disaster prevention and relief works



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Decision Making System of Pandemic Disasters

Quick grasp dashboard of disaster incidents

https://devcom.com/tech-blog/agile-advantages-for-business/

Assist to establishment "Epidemic Prevention Center" rapiddly

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EDP for All-Hazards Decision Making

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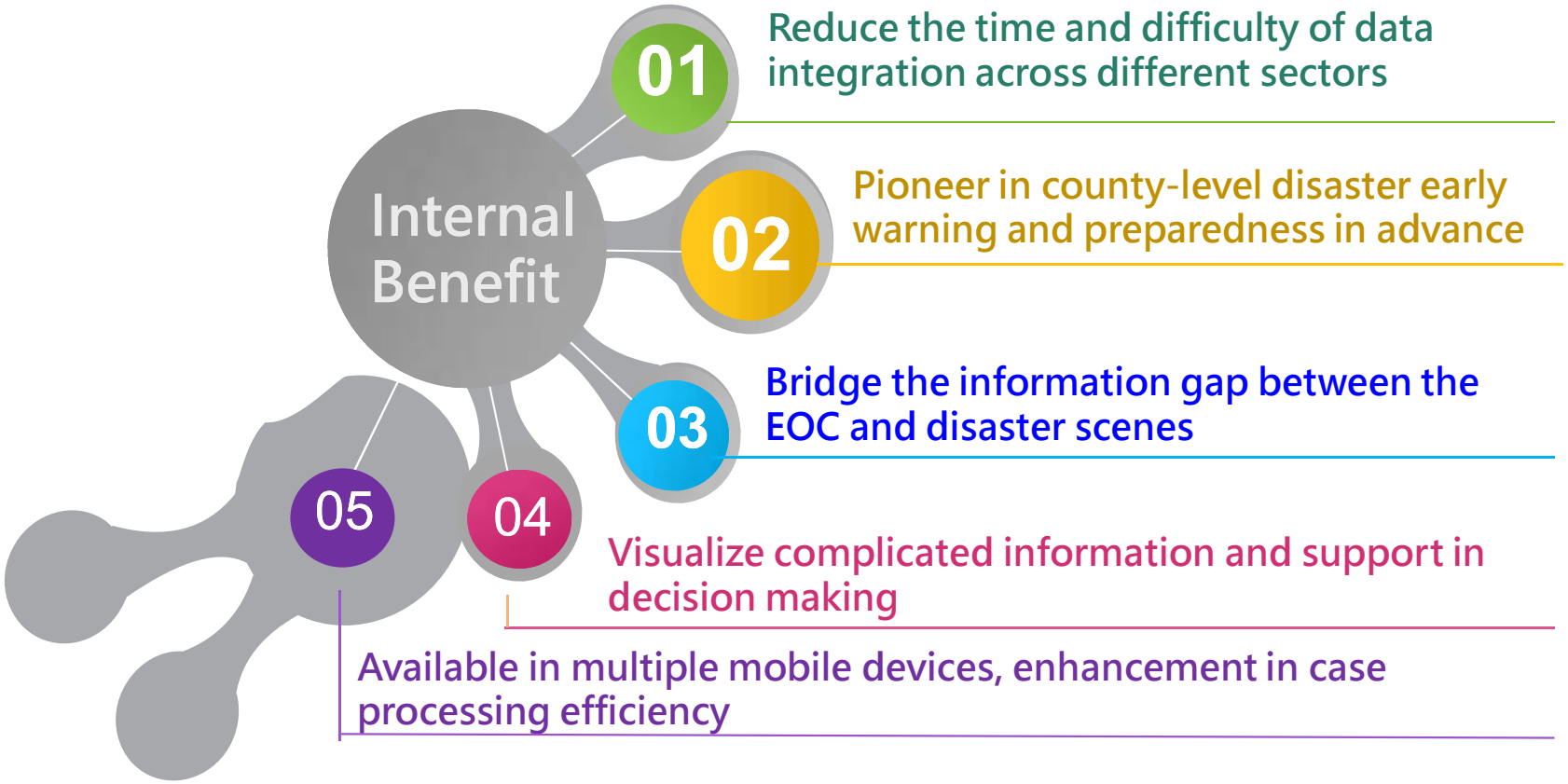
EDP: Internal Benefit



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EDP: External Benefit

01 Disaster cases 100% solved, meet the citizens' need

02 Landslides and floods area of influence can be predicted – protect the citizens from the disasters by timely disaster relief measures

03 Power outage prediction model enables the response to the disaster in advance and reduces the public inconvenience

04 Help with the government by offering public the easy access to the disaster information

05 Innovative approach of system development and planning gets recognized internationally

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7 prizes awarded at home at abroad

2021 WITSA Global ICT Excellence Awards: Smart city category

2020 標竿學習案例首獎
2020 第三屆政府服務獎
2020 第十六屆金圖獎最佳系統應用獎
2019 智慧城市創新應用獎
2018 雲端物聯網傑出應用獎
2018 資訊月百大創新產品金質獎

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Summary

- EDP has been comprehensively promoted by all levels of government agencies and communities in New Taipei City, and has provided citizens with proactive, real-time, and accurate information and services, enabling the New Taipei City government to successfully face the challenge of 6 major natural disasters and epidemics. However, people in other parts of the world are still challenged by the similar challenge.

- By introducing this disaster prevention and relief platform to the city governments, the efficiency of disaster response can be boosted significantly, while the casualties and losses of the public can be reduced.

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Thank You Very Much!

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Q&A

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CURRICULUM VITAE
[Presentation overview]

Presenter – Mr. Somvir Singh
Position – Assistant Divisional Officer,
Delhi Fire Service

ADDRESSING PSYCHOLOGICAL ISSUES TO IMPROVE RESPONSE IN WAR LIKE SCENARIOS

SOMVIR SINGH, AMIE
Asstt. Divisional Officer
Delhi Fire Service

THE DATES WHICH CHANGED THE HISTORY

28 July 1914 – 11 November 1918

01 September 1939 -02 September 1945

06 August 1945 – 09 August 1945

UNDERSTANDING A WAR

1

2

3

WAR:

- Onset starts in minds much earlier
- A state of armed conflict between different countries or different groups within a country, to protect the territories, patriotism at its peak
- The coping capacity of the countries is on test i,.e a type of man made disasters

FROM FIRE FIGHTER'S PERSPECTIVE

- Responding to the shelled or bombed premises, sometimes on the calls from police or military sirens, multiple buildings on fire, limited manpower
- You shell it ….we save it…attitude

Challenges?

- No protocol in place, no adherence of standard turn out procedures, no incident command system

IMPACTS OF WAR

- Huge loss of lives (combatants and non combatants) death is just the tip of an iceberg, followed by plethora of mental health issues (41 deaths, 134 injuries of rescuers reported from Ukraine war)
- Extensive damage to infrastructure
- Poor air quality leading to respiratory problems
- Complete disruption of routine life
- Cognitive changes, emotional changes and behavioral changes

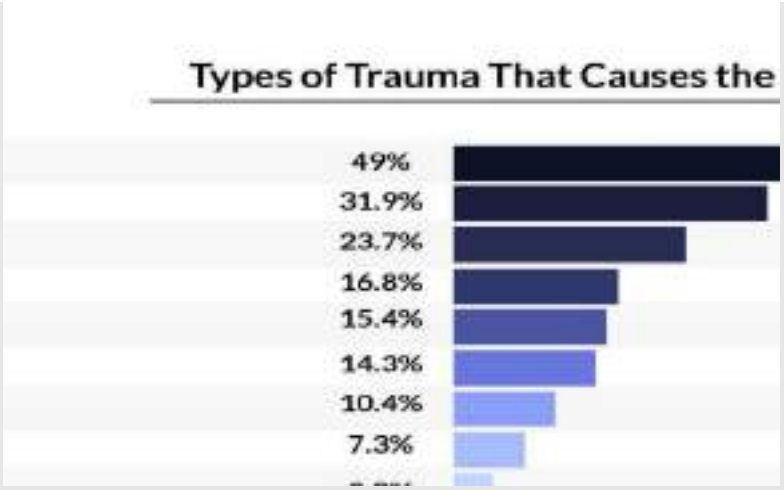
UNNOTICED CHANGES INDUCED BY WAR

- Disturbed sleep patterns and nightmares
- Intermittent explosive disorder (anger outburst)
- Attentiveness and social phobia
- Mistrust, suspicion and sense of hopelessness
- increase in criminal behavior patterns

PSYCHOLOGICAL IMPACTS ON FIRE FIGHTERS

- High stress level, increase in PTSD, ASD, anxiety, fear, insomnia
- Lack of decision making
- Slower responses and reflex actions
- Lack of interest in doing work
- Memory lapse
- Struggling with residual memories of difficult calls

These psychological effects have a massive impact on the individual firefighter and also on the efficiency of fire services and also carries economic loss



WHAT STATISTICS INDICATES

- High rates of mental disorders: PTSD(57%), schizophrenia (22.2%) and bipolar disorder
- Increase in major depressive disorder
- Increase in suicidal thought patterns
- Increase in auto-mutilation (tendency of self harm)
- Substance abuse disorder (alcohol and drugs)

ECONOMIC IMPACT

- Non addressing the psychological issues carries a huge burden on the economy, as per a study conducted by WHO, it costs 16 trillion US dollar , globally (source https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5007565/)

- Therefore due attention is required, so that resiliency of the fire fighters can be ensured

DEALING WITH ANXIETY, FEAR, SUICIDAL THOUGHTS

- Critical incident stress debriefing (CISD) sessions soon after the incident by the team leader
- Motivational lectures
- Rest and physical fitness exercise regime
- Regular therapy sessions from professionals
- Promoting recreational activities
- Establishing and ensuring a supporting work environment

DEALING WITH ASD (ACUTE STRESS DISORDER)

- ASD-SYMPTOMS experienced during or immediately after the trauma
- Occurs within 4 weeks after a traumatic episode or events
- Generally lasts for 2 days minimum or 4 weeks maximum
- If exceeds a months, person is assessed for PTSD
- Sharing of thoughts and counseling sessions with professionals

DEALING WITH PTSD (POST TRAUMATIC STRESS DISORDER)

- Disorder that occurs following an extreme traumatic episode or event
- Person re-experiences the event, avoids reminders of the trauma and exhibit persistent increased arousal
- Sharing of thoughts and counseling sessions with professionals and medical treatment
- Approx. 30-40 % rescue workers are diagnosed with PTSD

CONCLUSION

- The fire departments should be resilient enough to attain quick recovery by inducting professional mental healthcare providers, motivational leaders
- Small and coherent troops and adequate reserve force for backup
- Induction of modern technology equipments so as to minimise the muscular work
- Provision of special perks (compensation, reward)
- UNO may be approached to think of formation of a society (International fire fighters society) on the lines of **International Red Cross society** to provide unhindered humanitarian activities

?

THANK YOU

stosomvirsingh@gmail.com

CURRICULUM VITAE [Presentation overview]

Presenter – Lt. Col. Rakesh Verma
Position – Lt. Colonel Indian Army

IMPERATIVES OF FIRE SAFETY AND EMERGENCY RESPONSE

IN

CONTEMPORARY WAR LIKE SITUATIONS

PREVIEW

- MIL PERSPECTIVE
- ESSENTIALS OF WARTIME FIRE SAFETY
- COLLATERAL DAMAGE : CIVIL- MIL FIRE SAFETY
- RESPONSE

MIL PERSPECTIVE : FIRE SAFETY & EMERGENCY RESPONSE

- **FIRE SAFETY & EMERGENCY RESPONSE – INBUILT BY DESIGN**
- **TRAINING**
- **STORAGE**
- **HANDLING**
- **MAINTENANCE**
- **DEPLOYMENT**
- **SITING**

FIRE ***an essential element of war aimed at Neutralisation Destruction of war waging equipment***

ESSENTIALS: FIRE SAFETY OF MILITARY MEN MATERIAL & EQUIPMENT

- CLASSIFICATION – INCINDIARY / FLAMMABLE MATERIAL, DANGEROUS GOODS (EXPL)
- DAMAGE POTENTIAL – RADIUS OF ACTION
- STORAGE / SEGREGATION – AMMUNITON, FOL, LOGISTIC DUMPS, DEPOTS, AREAS
- CLIMATE – TEMPERATURE HUMIDITY MOISTURE WIND SPEED/ DIRECTION
- TERRAIN – PLAINS, MOUNTANEOUS, WATER
- SAFETY PRECAUTIONS – MINIMISE LOSSES
  - ON MOVE – SAFETY DISTANCE
  - STATIONARY/CAMP – SEGREGATION, PROTECTION WALLS/BUNDS, LIGHTENING CONDUCTERS

WAR LIKE SITUATIONS : COLLATERAL DAMAGE

- **FIRE SAFETY : THIN LINE BETN MIL & CIV**
- **CIV ASSETS : COLLATERAL DAMAGE (SCHOOLS, BUILDINGS) - INSURGENCY**
- **STRATEGIC ASSETS (TGTS) : OIL DEPOTS, RAILWAYS, BRIDGES, LOGISTIC AREAS**
- **AIM – LOWER THE MORALE OF POPULATION, INFLUENCE DECISION MAKING**
- **RESPONSE DURING COLLATERAL DAMAGE : FIRE SERVICES, HOMEGUARDS, VOLUNTEERS**

AIM – ***Lower the morale of population, influence decision making***

COLLATERAL DAMAGE: INCREASING THREAT

- **BATTLE FD TRANSPARENCY: NEAR REAL TIME SITUATIONAL AWARENESS OF BATTLEFD**
- **TECHNOLOGICAL ADVANCEMENTS: AERIAL AND SPACE SENSORS**
- **PRECISION TARGETTING : UAV, LASER GUIDANCE, GEOINT**
- **MERGING LANDSCAPE OF CIV & MIL BATTLEFD:**
- **CIV TGTS: POWER STATIONS, GAS PIPELINES, RAIL LINES,OIL RIGS/ STORAGE, GAS STNS**
- **STRAT TGTS INCREASE ECONOMIC COST OF WAR**

Economic costs of fire sabotages, detrimental to war fighting capability of a Nation

RESPONSE: FIRE SAFETY IN WAR LIKE SITUATIONS

- POLICY: FIRE SAFETY, A STATE SUBJECT AND MUNICIPAL FUNCTION NEED TO INCL STRATEGICTHREATS
- COMPREHENSIVE POLICY INCLUDING STRATEGIC FIRE SAFETY DOVETAILING NATIONAL EFFORT IN TRAINING, PROVISIONING FOR WAR LIKE SITUATIONS
- APPROPRIATE SCALABLE RESPONSE MECHANISM FOR FIRE SAFETY NEED TO BE EVOLVED
- STRATEGIC FIRE THREATS ARE MORE IN PEACETIME (SABOTAGE)

THANK YOU!!


CRISIS
MANAGEMENT
CONFERENCE 2022
Challenges to Fire and Emergency Service Responses