NEC's comprehensive disaster control system

Toshima City

Challenges

Home to Ikebukuro, Japan’s second largest railway terminal, Toshima City had to develop a swifter way of responding to rapidly changing conditions in the event of a natural disaster, and help stranded commuters get home or find shelter.

Solution

NEC’s comprehensive disaster control system uses strategically placed cameras to collect and visualize accurate real-time footage on damage caused by natural disasters, along with ground-breaking crowd behavior analysis technology to detect commuter congestion and help formulate swift countermeasures.

Results

Toshima City is now able to provide stranded commuters with accurate information in times of natural disaster, conduct effective crowd control, and offer necessary aid and shelter in collaboration with other prominent metropolitan institutions and authorities. The new comprehensive disaster control system is fast become a key part of the local government’s drive to solidify its identity as a disaster-prepared, safe and secure city.

Overview

As one of the eight central administrative wards of the Tokyo metropolitan area, Toshima City is proud of its culture, its tasteful character and its dedicated efforts to create a safe and secure environment for residents and visitors. The city boasts a vast range of attractions from quiet, comfortable residential streets to some of Japan’s most vibrant shopping and entertainment areas. Toshima City actively promotes urban development through a number of forward-thinking schemes, gaining international Safe City certification through the World Health Organization (WHO) Collaborating Center on Community Safety Promotion, and developing a presence as an international city of arts and culture.

Challenges

Dealing with rapidly changing conditions in times of disaster: Lessons from the 2011 Great East Japan

Toshima City is home to Ikebukuro station, Japan’s second largest railway terminal. On average, 2.59 million commuters pass through the terminal every day. Highly development modern high-rise buildings and bustling shopping areas surround the terminal area, but densely populated wooden housing still makes up 40% of the Toshima City landscape.

Toshima City has been focusing on disaster response and prevention as part of its ongoing efforts to create a safe, secure city environment. When the 2011 Tohoku earthquake hit Northeast Japan, railway companies temporarily suspended train services to check for any damage to lines, leaving unprecedented numbers of commuters stranded in and around the Ikebukuro terminal. At the time, Toshima City was not ill equipped to instigate swift, predetermined emergency procedures or direct people to temporary transit areas. Yukio Takano, Mayor of Toshima City, says that, “The city was slow to grasp what was actually going on, and that resulted in a delay in our initial response.” Takeshi Kashihara, Head of Toshima City’s Disaster Prevention Crisis Management Section, adds that, “We just weren’t able to keep up with rapidly changing conditions using our traditional methods, which mainly involved getting staff on the ground to relay information via community wireless systems and coordinating information on physical whiteboards and paper maps.”

The Great East Japan Earthquake taught us several significant lessons. When natural disaster strikes, the thing people want most is up-to-date, reliable information. I recognized the urgent need to establish effective systems to help us collect and manage information, and, by extension, ensure the safety and security of Toshima City residents and visitors,” explains Mayor Takano.
Solution

Empowering NEC’s leading global technology to secure instant, accurate information

Following its experiences in the wake of the Great East Japan Earthquake, the Toshima City authorities decided to introduce NEC’s comprehensive disaster control system.

The city installed 51 disaster prevention cameras in emergency relief centers such as temporary shelters and schools, near major transport facilities, and on major roads. These cameras are designed to collect real-time information on damage caused by natural disasters. Footage from these cameras, along with reported warnings, damage reports, and information on the establishment of emergency relief centers can be compiled centrally on a geographical information system (GIS), and then displayed visually using maps, etc. (Graphic 1)

“\textit{The whole system is wonderful. Not only is it really good at collecting pertinent information, but it can also manage and deliver that information in a way that no other system has before},” says Kashihara. (Graphic 2)

Graphic 1: Various information is compiled via GIS and displayed on maps

The opportunity to use NEC’s indigenous crowd behavior analysis technology to help stranded commuters was a crucial factor in our decision to introduce NEC’s disaster management system. That specific technology analyzes any overcrowding or stagnation on disaster prevention camera footage, and issues an alert if predetermined threshold levels are exceeded. (Graphic 3)

“\textit{In my opinion, the system’s ability to alert us to any problems that we might have overlooked is truly revolutionary},” says Kashihara.

“Given predictions that, in the wake of the 2011 Tohoku earthquake, an earthquake is now more likely to occur directly beneath the Tokyo metropolitan area, we judged it imperative to introduce this comprehensive disaster control system,” explains Mayor Takano.

Graphic 2: Information collection, information control, information distribution

Graphic 3: NEC’s world-first crowd behavior analysis technology detects unusual levels of congestion or stagnation

The unique technology protects individual privacy by analyzing the behavior of groups of people as opposed to specific individuals.

Using NEC’s crowd behavior analysis technology to help stranded commuters. Issue alerts when any unusual crowd behavior is detected on disaster prevention cameras. Provide disaster response center with the real-time information it needs to make swift decisions and formulate measures to help stranded commuters.

Toshima City has also created a swifter response system to help stranded commuters in times of natural disaster. Measures include the establishment of local liaison and coordination centers or information stations, appeals for aid from specified private and public entities, and the provision of appropriate guidance for commuters via public websites, digital street signage, social networks, etc.

Mayor Takano insists, “First, we need to collect accurate information quickly. Then, we have to manage that information effectively. NEC’s disaster control system does all of that in one integrated operation. I intend to use this system to build up our city’s natural disaster response capability, and to further promote Toshima City as a safe and secure place to live and work.”

Results

Centralized information facilitates swifter decision-making

“Now, whenever an earthquake happens, we are able to check whether it has caused any fires or disruption simply by logging into the system from our disaster prevention center. Our response time has improved markedly, thanks to the real-time information collected from the disaster prevention cameras,” states Kashihara.

By collecting real-time information and offering an integrated visual representation of the overall situation, the comprehensive disaster control system enables Toshima City to make swift decisions in the event of a natural disaster. (Graphic 4)

Graphic 4: Improve user friendliness by integrating camera system and overall system interface

Thanks to its new disaster management system, Toshima City is now able to form appropriate disaster responses, such as the dispatch of personnel to affected areas and the establishment of relief centers and emergency medical aid stations, in close collaboration with local police and fire services and key institutions such as the Tokyo Metropolitan Government.

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