

# Technical Development for Effective Use of Existing Buildings by Rational Regulations on Fire Prevention, Evacuation Safety and Others

Period of research: FY 2016–2020

HAYASHI Yoshihiko (Ph.D.), Head  
HIMOTO Keisuke (Ph.D.), Senior Researcher  
Fire Standards Division, Building Department  
YOSHIOKA Hideki (Ph.D.), Senior Researcher  
Department  
TAKEYA Shuichi (Ph.D.), Head  
KATSUMATA Wataru (Ph.D.), Head  
KIUCHI Nozomu (Ph.D.), Head  
HIRAMITSU Atsuo (Ph.D.), Head

SUZUKI Junichi (Ph.D.), Senior Researcher  
MIZUKAMI Tensei (Ph.D.), Senior Researcher

Material and Component Standards Division, Building  
Urban Disaster Mitigation Division, Urban Planning Department  
Urban Development Division, Urban Planning Department  
Urban Planning Division, Urban Planning Department  
Equipment Standards Division, Building Department

*Keywords: Existing building, historic building, alteration of building use, fire prevention/evacuation safety regulations, building restrictions in land use zones*

## 1. Introduction

Revitalization of the region and promotion of international tourism by alteration or repair of historic and other existing buildings for their effective use are desired by local governments and private businesses that are committed to developing a community. We are developing the technologies required for the rationalization and smooth operation of the regulations on fire safety, evacuation safety and building restrictions in land use zones in order to facilitate the use of existing buildings. In this article, we introduce the outline of this technical development.

## 2. Outline of the Technical Development

### (1) Rational building regulations of the fire prevention and evacuation safety

The existing regulations of fire prevention and evacuation safety totally differ according to each building use. Therefore, it is sometimes difficult to be compliant with the regulations when the existing building use needs to be altered or the building is repaired. We are taking on the technical development towards performance-based regulations for all fire prevention and evacuation safety so that the alteration in the purpose of building use and repair is easily made as long as the necessary safety performance is achieved.



Photo 1: Examples of Effective Use of a Closed Primary School by Alteration of Building Use

### (2) Securing safety against fire in the region

There is increasing demand for the preservation and use of historic buildings and streets. However, if we need to be compliant with the current fire prevention regulations, it will be difficult to use wooden outer walls or wooden window frames; therefore, maintenance of the tasteful appearance of buildings and streets will be sometimes difficult. To solve this problem, we are developing the technologies required for the rationalization and smooth operation of current fire prevention regulations by taking both easing of regulations and alternative measures simultaneously, while securing the fire prevention performance of the building itself and the area as a whole.



Photo 2: Historic Townscape

### (3) Rationalization of the restrictions on building use in consideration of the environment in urban areas

Under the current zoning system, building uses, both applicable and not applicable, are strictly specified for each zone in order to realize the ideal figure of the area. This system is also applied to the alteration of the uses of existing buildings. (In the Category I exclusively low-rise residential zone, for example, the alteration of building use from housing to store/restaurant is allowed only for a multipurpose house with a store of 50 m<sup>2</sup> or under.) Therefore, we are developing technologies to evaluate the environmental impacts of building uses on an urban area that would contribute to the decision by a local government for special permission for the alteration of building use in order to facilitate the alteration of the uses of existing buildings.



Photo 3: Example of Alteration of Building Use from House to Restaurant/Store

## 3. Future Plans

We will advance this technical development for drawing up draft technical standards, guidelines, and others while maintaining a liaison with the related departments of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), local governments, the Building Research Institute, and academic experts.