

## 3-D ROW to minimize involuntary resettlement impact

### 1. Introduction

This paper proposes utilization of three-dimensional Right-of-Way (3-D ROW) development for the urban infrastructure development by reallocating urban space to both private and public ownership within the same community. Involuntary resettlement is unavoidable when building an urban highway network in a highly dense city; thus, 3-D ROW approach gives an effective solution to minimize involuntary resettlement and restore livelihood of project affected persons in an overpopulated city.



Photo 1. Hanshin Expressway and Osaka Central Business District  
Photo Source: [www.hanshin-exp.co.jp](http://www.hanshin-exp.co.jp)

Hanshin Expressway plays a crucial role in sustaining logistics and mobility in the Kansai metropolitan region which embraces Osaka as a mercantile city, Kobe as a port city, and Kyoto as an ancient capital and an international tourist city with 12 million people. Hanshin Expressway extends approximately 260km urban highway network on which 700 thousand vehicles run on a day. Hanshin Expressway has several showcases that utilize 3-D ROW that aims at allowing Project affected persons to relocate on/under the urban highway. The representative project examples are the shopping mall under the highway, the off-ramp penetrating a privately-owned building, and the community development by means of land readjustment on the high-grade bank under which Hanshin Expressway runs through.

This paper examines the legal framework to bring both infrastructure development and urban resettlement to a successful conclusion in a highly dense urban area.

### 2. 3-D ROW Development

#### 2-1. Background

As described herein below, there are three major factors to promote 3-D ROW development. 3-D ROW development would bring an effective solution to involuntary resettlement and harmonization between infrastructure development and community redevelopment.

- Minimization of Impact on Involuntary Resettlement

It is extremely difficult to relocate project affected persons for infrastructure projects in a highly dense urban area due to scarcity of vacant lands. Project affected persons would not solely be able to find resettlement sites in the same community. They would not be able to restore their livelihood if they are driven out of their community. Thus, involuntary resettlement would often cause litigations and prolong a project schedule.

- **Project Cost Constraint**

Scarcity of vacant plots in a highly dense urban area often causes imbalance between demand and supply for real properties; in other words, there are always much more demand for real properties, especially vacant lands, than that of supply. The imbalance triggers land value surge and leads to high project costs to acquire lands and relocate Project affected persons; thus, the elevated project costs would often annoy public sectors that carry out infrastructure projects in an urban area.

- **Harmonization between Infrastructure Development and Urban Community Redevelopment**

Linear infrastructure development (e.g., rail roads, toll roads) often bisects urban communities. Such bisection would certainly undermine livelihood and economic activities in urban communities. 3-D ROW development is an effective solution to prevent urban communities from being bisected.

## 2-2. Legal Framework

In principle, any development is prohibited on/under road structures. However, deregulation of the legal framework has allowed 3-D ROW development. There are three legal pillars to constitute 3-D ROW development; road act, urban planning act, and building standard act.

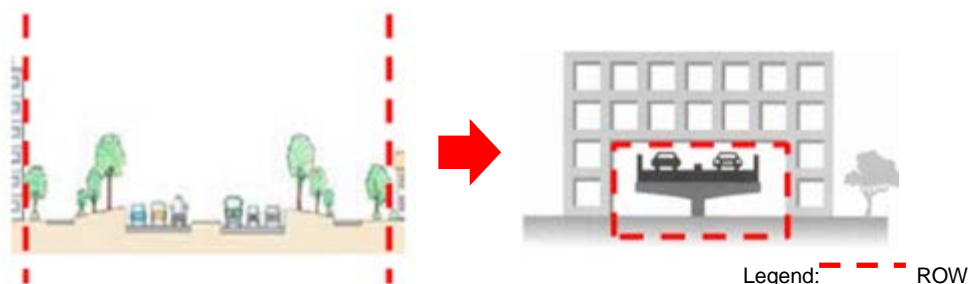


Figure 1. Conventional ROW VS. 3-D ROW

- **Road Act**

The road act allows road authorities to designate ROW three-dimensionally in case that road structures are constructed and refurbished. Designation of 3-D ROW allows building structures to utilize space on and under road structures.

- **Urban Planning Act**

The urban planning act allows planning authorities to integrate road structures into

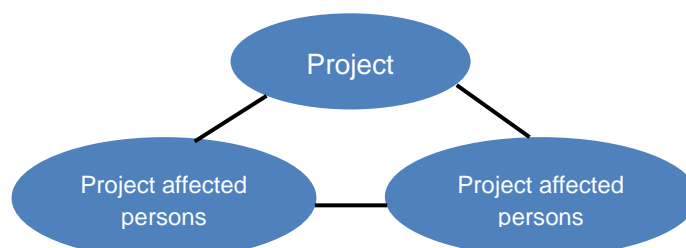


Figure 2. Legal Framework of 3-D ROW

building structures within the specific zoning. Zoning layers ROW onto building premises.

- Building Standard Act

The building standard act lifts a restriction to designate 3-D ROW within building premises in the specific zoning. Thus, a building can be developed on and under the road structures.

### 2-3. Case Studies

This clause introduces actual cases that apply the 3-D ROW development in the urban highway projects. Each project has notable characteristics in its structure and legal aspect.

- Shopping mall under the urban expressway ~ Semba Center Building and Hanshin Expressway



These photos show the Hanshin Expressway is running on the shopping mall. Garment industries including small retailers cluster over the district in the photos. Osaka city government and Hanshin Expressway authority tried to avoid/minimize involuntary resettlement for the livelihood restoration of Project affected persons.

Three legal rights (e.g., ROW, occupancy and tenancy rights) are layered on the project. Hanshin Expressway authority holds an indefinite-term tenure for the ROW of the urban expressway on the mall. Hanshin Expressway authority has entered into the occupancy right agreement to give an occupancy right to the building owner, the affiliated organization of the Osaka city government. The organization gives tenancy rights to the shop owners in the mall.

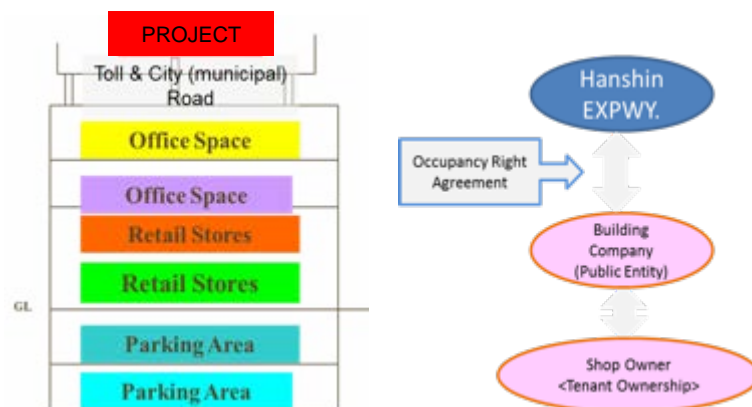


Figure 3. Structure Plan and Stakeholders of Semba Center Building

- Off-ramp penetrating through the commercial building



Photo 4. Hanshin Expressway Umeda Off-Ramp  
 Photo Source: [www.hanshin-exp.co.jp](http://www.hanshin-exp.co.jp)

The above photos show the off ramp of Hanshin Expressway is penetrating a commercial building. The building structure and off ramp structure are independent from each other. The canopy covers the off ramp to prevent a fire from car accidents. This development has become a showcase to apply for the 3-D ROW development to harmonize urban redevelopment with the urban expressway development.

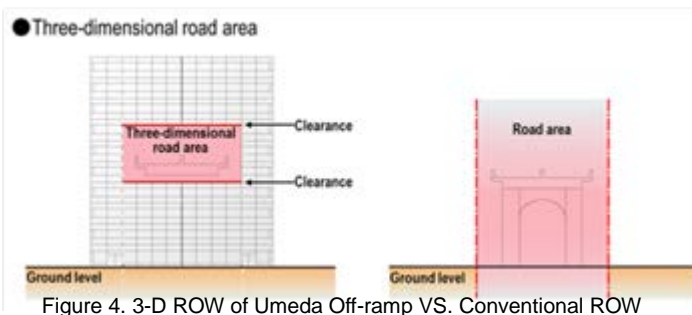


Figure 4. 3-D ROW of Umeda Off-ramp VS. Conventional ROW

In principle, any development is prohibited on and under ROW. However, 3-D ROW legal framework has allowed development on/under the ROW by designating the area of ROW three-dimensionally in accordance with the road act.

A conventional type of ROW (the right-hand side) extends its legal force from the ground level to some extent of the sky. On the other hand, 3-D ROW plan has allowed effective space utilization on/under the ROW by three-dimensionally defining the zone of the ROW.

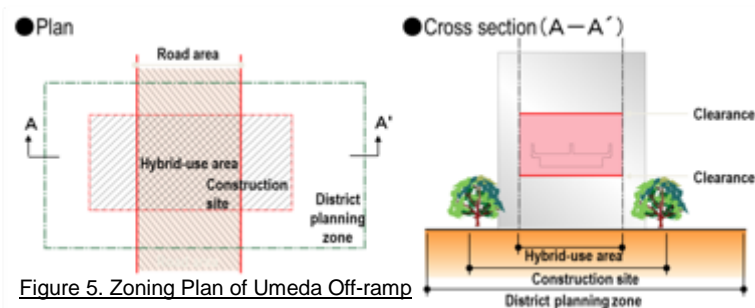


Figure 5. Zoning Plan of Umeda Off-ramp

The urban planning law defines a hybrid-use planning area to enable multiple-space utilization for both a building and an expressway. Urban planning law also defines a vertical limitation and road

clearance for the building construction. The building standard act lifts the building regulations within the area defined as a hybrid-use planning area so that building structures are allowed to construct within ROW. This application is limited to be applied within the



hybrid-use planning area with expressway projects.

- Integral Development along the River Side ~ Hanshin Expressway Yamatogawa Route and Reclaimed Dike Project



The above image shows the integral development project of the “super dike”. This project integrates town planning and urban expressway projects into the dike improvement project. Hanshin Expressway is planned to run under the super dike by defining its 3-D ROW. Residential development is also planned on the dike by the land readjustment project.

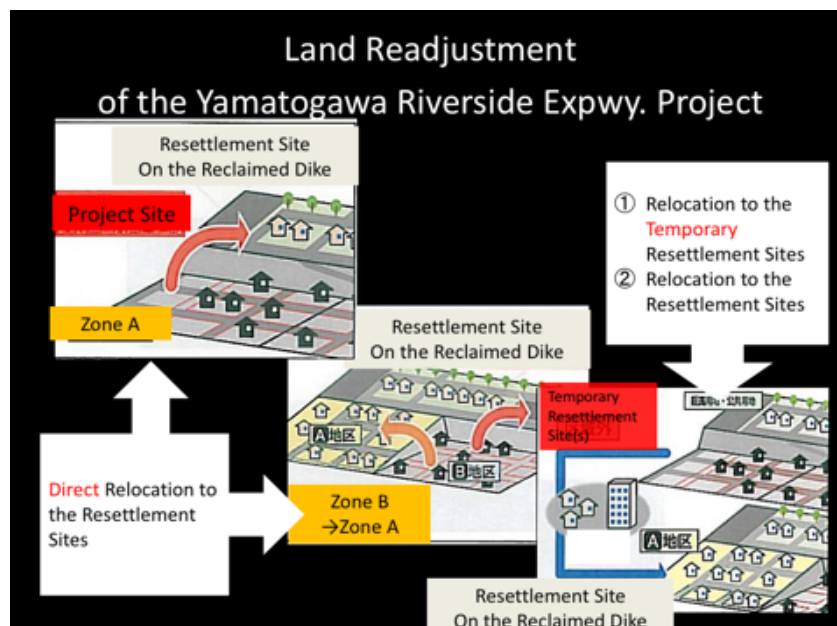


Figure 7. Land Readjustment of Yamatogawa River Side Project

This hybrid projects benefit the local community with flood control, minimization of the involuntary resettlement impact and river-side town development. The hybrid project is also designed to enable project affected person(s) to restore their livelihood in the same community by means of land readjustment.

### 3. Challenging Issues

The 3-D ROW development gives an effective solution to minimize impact on the involuntary resettlement in highly dense cities; however, several challenging issues are still found in the project scheme;

- Longer project periods

It takes more time to complete a 3-D ROW project than a conventional type of projects because of complexity in its legal framework and administrative process including designation of the zoning and ROW.

- Difficulty in consensus building

It is difficult and takes time to build consensus among project stakeholders since there are many stakeholders in a single project (e.g., Project affected persons (PAPs), Local Community, Planning Authority, Expressway Authority). Especially, PAPs have to be temporarily relocated until the project completion. This process gives anxiety to PAPs.

- Difficulty and complexity of the maintenance work

Building owners and expressway authority have respective responsibilities to maintain their own structures; however, settlements of liabilities on the integral parts of the hybrid structure are not clear in some cases. Thus, maintenance agreements are essential to bind in advance of the expressway operation.