Investigation to lower the cost of eliminating utility poles

Ryuji Inoue, Head Nodoka Oshiro, Senior Researcher Hitomi Oguri, Senior Researcher
Yuki Mitsutani, Researcher Road Environment Division, Road Traffic Department

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1. Introduction

The Ministry of Land, Infrastructure, Transport and Tourism has been eliminating utility poles to improve the disaster management capability of roads, secure safe and comfortable traffic spaces, and to build favorable landscapes and promote tourism. While the elimination of utility poles is a common practice in large cities in Europe and the United States, the ratio of zero-utility pole areas is still low in Japan. The Act on Promoting the Elimination of Utility Poles was issued and enacted in December 2016,[1] and the expectation for eliminating utility poles has been increasing since then. The common cable ducts that have been used in Japan are associated with the high construction cost of about 530 million yen per kilometer (including the cost of electric and communication facilities).[2] Thus, the cost needs to be lowered to promote the elimination of utility poles.

The National Institute for Land and Infrastructure Management has been conducting investigations to extract, organize, and examine technological challenges to lower the cost of utility pole elimination projects and to identify policies and technological trends in other countries to further accelerate the elimination of utility poles.

2. Identification of technical challenges to lower the cost

Challenges to reduce the cost of facilities (special parts, ducts, cables, ground devices, etc.) of utility pole elimination projects (common cable ducts, small boxes, direct burying, etc.) and construction methods are extracted and organized based on the characteristics of a location where utility poles will be eliminated (conditions along roads and road structures) and processes (probing of buried materials, relocation of obstacles, burying of ducts and cables, installation of special parts, supply conducts, installation of ground devices, etc.).

When organizing challenges associated with the characteristics of specific locations, the investigation is conducted assuming roads in residential areas where the electricity demand density is low, and utility poles will be removed using small boxes, commercial areas where the electricity demand density is high, and scenic areas in the suburbs where the electricity demand density is low, and the electricity demand remains relatively constant.

Figure 1. An image of residential areas

Figure 2. An image of scenic areas in the suburbs

3. Investigation concerning technologies and policies to lower costs

Based on the challenges extracted in 2, the authors are gathering information on the relevant technologies concerning methods that might contribute to a reduction in the cost of eliminating utility poles.

In other countries, utility poles are being quickly excavated and backfilled using special equipment and backfilling with concrete among other measures. The authors are investigating measures and technologies to reduce the cost in overseas cities, such as setting burying standards for electric wires and cables (e.g. direct burying, burying depth) and burying technologies (excavation, installation, backfilling, etc.).

Figure 3. Backfilling using low-strength concrete (Taiwan)

4. Future plans

The authors are going to continue efforts to establish technologies to reduce the cost to accelerate the elimination of utility poles.

☞For detailed information
1) Road Bureau, Ministry of Land, Infrastructure, Transport and Tourism
http://www.mlit.go.jp/road/road/traffic/chicyuka/chi_20_01.html
2) The First Utility Pole Elimination Promotion Committee, Reference 3
http://www.mlit.go.jp/road/ir/ircouncil/chicyuka/pdf01/5.pdf