

## Research Trends and Results

# Concrete Pavement: Applicability and Maintenance Methods

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(Key words) Road, concrete pavement, life cycle costs, maintenance

### 1. State of concrete pavement

Cement concrete pavement (hereinafter referred to as "concrete pavement") in Japan, covered about 30% of all paved roads during the period of high economic growth in the 1950s and 1960s. But the percentage of concrete pavement has fallen steadily over the years, and in recent years, has been flat at about 5% of all road pavement. This is a rate lower than in other countries (Fig. 1).

Figure 1. Percentages of Road Pavements in Various Countries

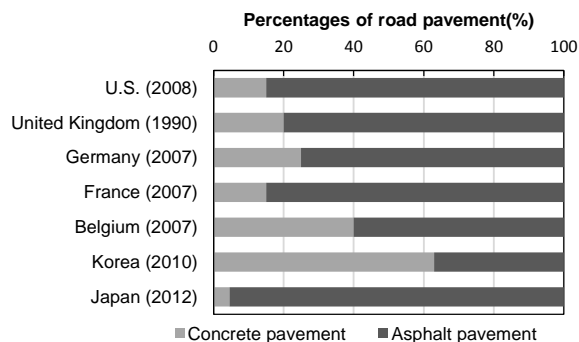


Photo 1. Concrete pavement on National Highway No. 20 in Hachioji City in Tokyo (In service since 1957. Photo taken in February 2014)

Reasons why concrete pavement has not been used in Japan in recent years are thought to be its initial cost that is higher than that of asphalt pavement, the fact that it is difficult to repair it when it is damaged and it is difficult to tear it up to perform work under a road, and problems with riding comfort and noise in cars traveling on it.

But concrete pavement is more durable than asphalt pavement, with some concrete pavement still in use more than 50 years after construction (Photo 1), and in some cases, it fully displays its strong points through use at

appropriate places and suitable maintenance.

### 2. Study of applicability of concrete pavement

One way to lower the life cycle cost of pavement would be to use concrete pavement, so we are working to identify conditions that make its use appropriate.

In FY2014, we surveyed the state of damage to concrete pavement visually at about 20 locations throughout Japan, and also surveyed road conditions (work method used, pavement configuration, traffic volume, percentage of large vehicles, road structure conditions, alignment and so on), and by organizing the correlations between the two results, we identified conditions suitable (and not suitable) for concrete pavement.

### 3. Study of Concrete Pavement Maintenance Methods

Concrete pavement differs from asphalt pavement structurally and in the way it is damaged, so it is also necessary to study appropriate inspection and diagnosis procedures, and methods of selecting maintenance work methods. We have studied inspection methods since FY2013, and based on the results, are now actually performing inspections on existing roads to discover problem points. We are also studying methods of appropriately selecting repair methods by surveying repair methods used, state of damage at repaired locations, years passed since repair work, and deterioration or further damage to repaired locations at locations where existing concrete pavement has been repaired.

### 4. Future efforts

Based on these studies, we wish to summarize technical documents and release them in the field so that concrete pavement will be used on for road construction.

[Sources]

1) Technical Note of NILIM No. 747, Technical documents concerning deformation of concrete pavement, July 2013

<http://www.nilim.go.jp/lab/bcg/siryounn/tnn0747.htm>



Photo 2. Characteristic Joint Damage on Concrete Pavement and State of Repair