

# Preface

If we look back over the development of infrastructure, there are traces of such from an archaeological standpoint from the earliest times, but if they rely solely on the etymology of infrastructure, its origins can be traced back to Ancient Rome. The ancient Romans are referred to as ‘the fathers of infrastructure’ by modern men, and the word “infrastructure” itself is said to be derived from combining the latin word *infra*, used by ancient Romans to mean “below,” or “underneath,” and the latin word *structura*, which means “building,” or “structure.”

Though infrastructure created by the Romans included many things, such as temples, amphitheaters, and public baths, the Appian Way and the Aqua Appia—both planned and constructed by Appius Claudius Caecus (340 - 273BC)—became the model for the great Roman roads and aqueducts that have left their mark in posterity as the great infrastructures of Rome<sup>Note</sup>.

There is a story, which takes place in the 6<sup>th</sup> century—several hundred years after the construction of the Appian Way—about a senior statesman of the Eastern Roman Empire visiting Italy and marvelling at how the Roman roads has continued to function for such a long period of time, but this can be attributed to the Roman Empire investing in the proper maintenance and repair of their roads.

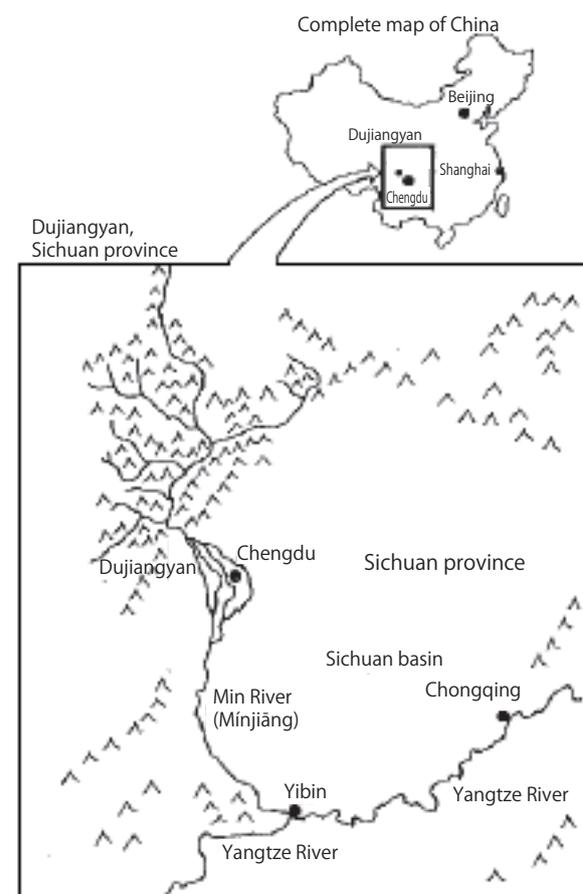
Meanwhile, if we look at the development of infrastructure in Ancient China, during the Warring States period (221 - 206BC), Li Bing, a military and civilian governor of Shu, constructed the Dujiangyan, a massive irrigation infrastructure on the Min River, which is a tributary of the Yangtze River, located about 60km northwest in an area known in modern times as Chengdu, in the Sichuan Province of China. The structure of Dujiangyan not only prevented damage from the flooding of the Min River, but also made it possible to divert the water into the Chengdu Plain. Since then, the Chengdu Plain has been called the ‘Land of Tianfu,’ and is one of the foremost agricultural areas of China. Astonishingly, the Dujiangyan continues to perform the function for which it was designed over 2,200 years ago, but this can be largely attributed to the fact that repair work was continuously carried out by successive river administrators for proper maintenance.

Figure 1 The Appian Way (Rome, Italy)



Source) The Japan Civil Engineering Consultants Association, General Incorporated Association

Figure 2 Location of Dujiangyan



Source) Joji Tanaka (2001) "Dujiangyan and its Founder, Li Bing: Memorandum of Irrigation Structures in Ancient China" Koyo Media

**Note** An even more ancient example of a road would be the Royal Persian Road, built by Darius I, king of the Persian Achaemenid Empire (r. 522 - 486BC).

If we reflect back on history in this way, we can see that great infrastructure in any country that has been constantly updated and properly maintained is able to carry out the same function for which it was designed over hundreds of years, and leave its mark on history.

The Ministry of Land, Infrastructure, Transport and Tourism (MLIT), having estimated that Japan's social infrastructure that was developed after the high-growth period will age rapidly in the future, has designated 2013 as the “First Year of Maintenance,” to demarcate the year for when serious efforts towards realizing a beginning of the age of maintenance of general social capital started. In this White

Paper, we will discuss the maintenance and updating of social infrastructure in light of the current situation of aging infrastructure, and present the future direction of the MLIT <sup>Note</sup>.

Figure 3

Dujiangyan (Dujiangyan, Sichuan province, China)



Source) The Japan Civil Engineering Consultants Association, General Incorporated Association

#### (References)

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#### Note

In general, the term ‘Infrastructure,’ is assumed to refer to physical structures such as roads and sewage systems. For example, in the Japanese dictionary “Kojien” (6th edition), infrastructure is defined as, ‘Facilities that are foundations for societal living and industry. Social capital that forms an industrial base, such as roads, railways, ports and harbors, as well as social capital relevant to supporting societal living, such as schools, hospitals, parks, and social welfare facilities. However, when the term used is ‘Social Infrastructure,’ various public services and general systems may be included in the discussion. For example, in the Cabinet Office 2013) “FY 2013 Economy and Finance Annual Report,” ‘Social Infrastructure’ is a term that refers to, ‘A wide range that includes roads, ports and harbors, water supply and sewage systems, electricity and gas, medical care, fire-fighting, policing, and government services.’ So when the term ‘Social Infrastructure’ is used, the concept encompasses a very wide range. In this white paper however, the term ‘Infrastructure’ will mainly be used for social capital that are physical facilities, while the term ‘Social Infrastructure’ will be used to include public transportation services provided that are related to transportation infrastructures, as we discuss the maintenance, management and upgrading of such. Therefore, the term ‘Social Infrastructure’ will be used in this white paper, but when discussing infrastructure that refers only to physical facilities, the terms ‘Infrastructure’ or ‘Social Capital’ will be used.