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Smart community infrastructures — Smart transportation for rapid transit in and between large city zones and their surrounding areas



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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This document was prepared by Technical Committee ISO/TC 268, *Sustainable cities and communities*, Subcommittee SC 1, *Smart community infrastructures*.

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Introduction

A megalopolis is a huge city zone covering a number of large and medium-sized cities, normally including a national capital, where political and economic functions and business activities are concentrated. The original megalopolis is the area located on the east coast of the United States, from Boston down to New York and Washington DC, which is known as BosWash. In Europe, the area covering London, Brussels and Paris is informally called Blue Banana. In Asia, the zone covering Tokyo and Osaka in Japan is known as the Tokaido Megalopolis. These three megalopolises have populations of 52 million, 100 million and 67 million, respectively, and include national capitals and commercial and industrial cities, as well as academic, scientific and educational facilities.

Huge numbers of people travel, including commuting, to and from cities and their surrounding areas in a megalopolis on a frequent or daily basis. To meet their needs and provide suitable transportation services, rapid surface transit systems have been developed, including highway buses and trains on enhanced rail tracks. The effectiveness of each mode of transport depends on the travel distance and the number of passengers. Highway buses are convenient for travel distances of up to 200 km. For distances of up to 1 000 km, high-speed rail (HSR) provides easy and rapid transit and has been developed and introduced in response to demand in these megalopolises, including for the purposes of inter-city commuting of less than 200 km. HSR uses trains with a large capacity which can reach speeds of over 200 km/h. Such trains run directly into city centres, removing the need for passengers to change services, and offer a high frequency of service, all for a relatively low price. This has proved very popular with residents in these megalopolises, as shown in [Annex A](#).

HSR has been transporting large numbers of people quickly and frequently between cities worldwide for over 50 years. As of April 2015, HSR conveys 1 600 million people per year on service lines of 29 792 km in a total in 10 countries, utilizing 3 603 train sets. This indicates that HSR is a successful rapid transit system for people, especially in megalopolises. By installing HSR in megalopolises or on a route connecting a megalopolis and other cities outside this area, the rapid transit of people can easily be achieved and managed, resulting in short travel times that facilitate both political and economic work and promote commercial business. Using such transportation is one solution to a typical city issue in a megalopolis.

Highway bus transportation systems have also been established as highway networks have been extended. Among the benefits of such systems is the ease of planning service routes and schedules, as well as the actual start-up of such bus transportation services, since these companies do not need to prepare extensive and expensive physical facilities such as those required for HSR operations, namely railroad tracks and civil engineering structures, that are built and financed by rail companies at their own or government expense. It is also easy to change both service frequency and routes according to passenger flow. Therefore, highway buses can be an effective means of quickly conveying people for a distance of less than 200 km by optimizing the transport capacity between cities.

Another benefit of highway bus and HSR services is that they convey citizens in large numbers as a "lot." This reduces citizens' travel expenses; in fact, using personal transportation (driving personal vehicles on public roads) can cost 20 times as much as using highway buses or HSR. Lot transportation also results in much lower CO₂ emissions than in cities where only personal transportation is used.

These two transportation modes, highway buses and HSR, are examples of indispensable smart transportation for megalopolises which have specific issues regarding cost-effective, accessible and user-friendly transport for travellers.