

## Chapter 8.4

# Planning Infrastructure: Considerations for Regional Development

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### ABSTRACT

*Current rapid increases in the scope of regional development and the reach of technology have combined with the expanding scale of modern settlements to focus growing attention on infrastructure needs. This has included organizational and funding systems, the management of new technologies and regional scale social provisions. In this chapter, the evolution of urban and regional infrastructure is traced from its earliest origins in the growth of organized societies 5,000 years ago. Infrastructure needs and provision are illustrated for the arenas of metropolitan, provincial and rural regions. Rural infrastructure examples and lessons are drawn from global case studies. Recent expansions of the scope of infrastructure are examined and issues of governance and process discussed. Phased planning processes are related to cycles of program adoption, objective formulation, option evaluation and program budgeting. Issues of privatization and public interest are considered. Matters of contemporary global significance are explored, including the current economic contraction and the effects of global climate change. Conclusions are drawn about the role and importance of linking regional planning to coherent regional infrastructure programs and budgets.*

### INTRODUCTION

Previous research has shown how the dramatic growth in the size, health and prosperity of cities over the last five thousand years has depended on their ability to invent and install appropriate urban

infrastructure (Childe, 1951, 1957, Mumford, 1945). Starting with access to water, roads and waste disposal, through provisions for health and education, to the more recent additions of power and electronic communications, the extraordinary growth of cities to their current role of accommodating more than half the world's six billion people on a tiny fraction of the earth's surface has

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been made possible by successive waves of new urban infrastructure (UN, 1995, 2001).

When we turn to the wider regional scale, the roles and relations of infrastructures are more complex. Not only must they support life throughout their own much wider regional extents, but they must also provide central cities with life-giving resources and opportunities for their future urban expansion. Nowhere is this reciprocal relation between cities and regions better expressed than in the infrastructure networks which link them: regional supplies flow to satisfy urban demands, while cities generate the energy and products to sustain the regional systems. Regional supplies of water, power, labor and raw materials flow into the city, while urban flows of processed information, organization, control and consumer goods flow outwards, using and supporting regional infrastructures.

### **The Evolution of Regional Infrastructure**

From the beginning of settled societies in the valley civilizations of five thousand years ago, route ways and water have provided the basic necessities for settled communities. The Nile, Euphrates, Indus and Yang Tse were not only sources of water but also of transport, and their riverside wharves and warehouses were among the earliest forms of infrastructure (Manley, 1996). Approach channels were dredged and long distance roads opened up to enable exchange with distant areas, on which the cities thrived encouraging the specialization of function across regions of contrasting but complementary character (Childe, 1951). Later, other regional routes developed along the lightly forested slopes of uplands such as the British Pennines and the South American Andes, amplifying opportunities for trade to link different valley civilizations by regular exchange (Mumford, 1961).

Around the shores of the Mediterranean, paved roads linked wheat fields on coastal terraces to

hillside vineyards and olive groves on the upper slopes. Irrigation networks spread along the banks of the Nile, Indus, Euphrates, Colorado and Mekong rivers, making possible the permanent agriculture that created the surplus production supporting the great civilizations of antiquity (Childe, 1957). If regional development infrastructure of route ways and water supply had made possible the growth of the early city states, it was their expansion onto an imperial scale that assisted the growth of the great empires of Egypt, Babylon, Rome and Han China (Thubron, 2007). In particular, the organizational genius of the Romans led to their designation of administrative provinces – including Gaul, Brittany, Germania, Cappadocia, Cyrenaica and Egypt – to build, manage and maintain the networks of regional infrastructure on which the productivity of their newly acquired possessions depended. Great aqueducts (which still survive) brought Alpine and Pyrenean water from their snow fed catchments to the dry but productive valleys, coastal lowlands and ports of Provence and Catalonia (Mumford, 1961). Similar arrangements underlay the Han and Ming dynasties in China, whose great cities also depended on the regional infrastructure of roads and aqueducts (Thubron, 2007).

Similarly, the remarkable wealth-creating energy of cities such as Venice and Amsterdam and the Hanseatic League rested upon networks of regional development stretching far inland up the rivers of the Elbe, Scheldt, Rhine and Trent (Fisher, 1960). Even the warring Tuscan cities of Sienna, Florence, Pisa and Perugia depended upon maintenance of the regional infrastructure of roads, ports and aqueducts which they had, ultimately, to share (Hibbert, 1979; Heywood, 1904, 1909). In the same way, the rise of the regional and national states of the Renaissance and modern times rested upon foundations of regional infrastructure, linking rural supplies of coal, water and mineral ores to urban concentrations of population and power (Hamilton, 1947). New colonial empires in North and South America, Asia

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