



RESEARCH REPORT

Executive Summary:

Smart Cities

Smart Technologies and Infrastructure for Energy,
Water, Mobility, Buildings, and Government:
Global Market Analysis and Forecasts

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Section 1

EXECUTIVE SUMMARY

1.1 A Critical Phase for Smart Cities

The momentum behind the development of smart cities continues unabated. City leaders around the world are committing to smart city objectives as they attempt to shape the development of their cities to meet social, economic, and environmental challenges. National governments are also encouraging cities to become centers of innovation and drivers of sustainable growth.

As a market, though, the smart city is at a critical point. There are many grand visions for the development of smart cities and even more pilots and demonstration programs. However, there are far fewer large-scale, financially sound deployments of smart solutions to solve core city problems. Today, city leaders and suppliers are recognizing that there needs to be a clearer and faster route to the broader deployment of proven technologies and solutions. The question is how to establish the right business models and the right deployment strategies to enable this expansion.

Other smart city trends include a growing emphasis on resilience and climate adaption in city strategies and a new focus on making smart city development relevant to citizens and their daily lives. Still other trends include a desire for more data-driven policymaking and real-time operational control and a recognition of the need for standards to help drive smart city programs to the next stage.

Navigant Research expects the rate of adoption of smart city solutions to accelerate over the next 2 years. The broader spread of Internet of Things (IoT) technologies will provide further momentum for these developments, as will the development of more sophisticated understanding of city requirements on both the demand and the supply side.

1.2 Definition and Key Trends

Navigant Research defines a smart city as the integration of technology into a strategic approach to sustainability, citizen well-being, and economic development. The concept of the smart city covers a wide range of communities and governance models—spanning from megacity regions to small towns and from historic urban centers to greenfield developments. Similarly, an incredible diversity of customers, suppliers, technologies, and requirements falls under the smart city label. For these reasons, the smart city should be seen as a complex confluence of several existing markets, as well as the driver for new, emergent solutions that span existing industries, operations, and services.

1.2.1 The Emergence of New Business Models

In the age of restricted government budgets, innovative business models are needed to finance the large infrastructure requirements that are often inherent in smart city projects. Funding mechanisms such as public-private partnerships (PPPs), energy-saving performance contracts (ESPCs), and build-operate-transfer (BOT) agreements are some of the most common forms of business models being utilized to expand smart city development.

1.2.2 More National Programs

National and regional involvement in the smart city market has been increasing in recent years, lending support to city efforts. Australia is the most recent country to launch a national program, joining a list that includes China, India, Japan, Singapore, South Korea, and the United Kingdom. In the United States, smart city developments have been given a lift through the Obama administration's Smart City Initiative and the U.S. Department of Transportation's (DOT's) Smart City Challenge.

1.2.3 Acceleration of the Energy Transition

Aggressive city energy policy and climate action programs are serving as the foundation for energy efficiency and clean energy projects. An increasing number of cities have defined ambitious targets for improving sustainability and reducing greenhouse gas (GHG) emissions and energy consumption. These climate action plans are serving as a basis for sustainable development in major cities around the world.

1.2.4 Emerging Models for Mobility on Demand

Multi-modal programs and applications that allow city residents to plan trips using a variety of transport options have been a major focus of smart city mobility strategies. Leading cities are now exploring how that model can evolve to take advantage of mobility on-demand services that combine transit services, carsharing, ridesharing, and other on-demand services such as bike-sharing. The emerging vision is of integrated information and payment services that enable higher levels of convenience for consumers while also supporting the drive to low carbon urban transportation.

1.2.5 From Point Solutions to Multi-Application Networks

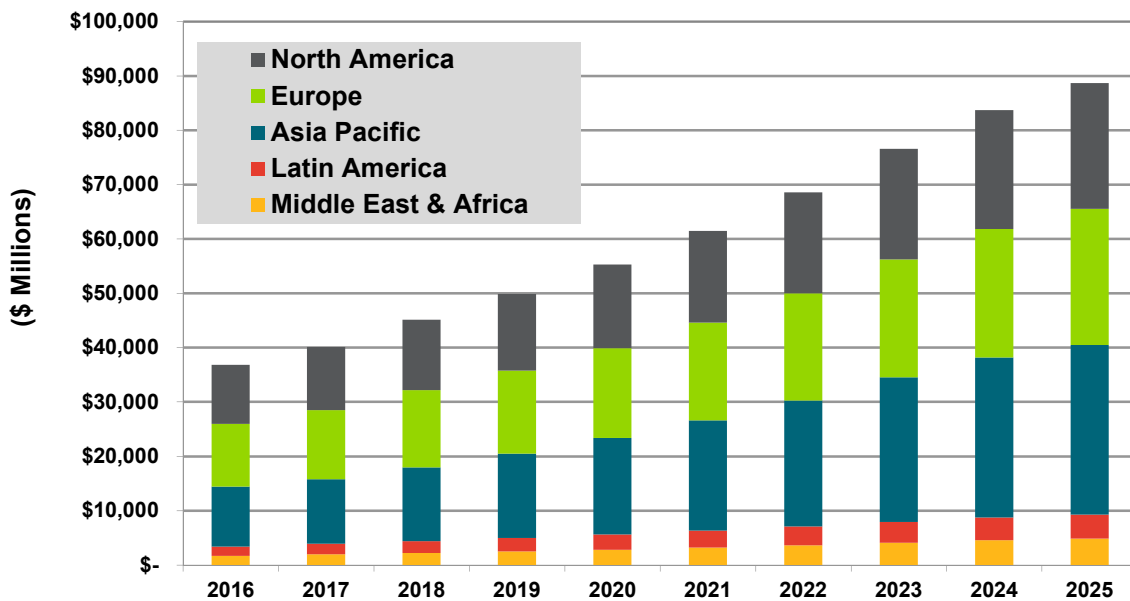
There is a growing awareness among city leaders of the potential benefits of integrated, multi-application approaches to the deployment of smart city infrastructure. However, the majority of procurement is still being structured around the siloed requirements of individual departments. Front-line managers and procurement teams need to have a better understanding of the benefits of more coordinated and integrated approaches to the use of smart solutions. To achieve this, smart city projects have to shift their focus from technical feasibility to the demonstration of measurable outcomes and robust business cases.

1.3 The Market Opportunity

Navigant Research expects the global market for smart city solutions and services to be worth \$36.8 billion in 2016. Smart city market revenue is projected to grow to \$88.7 billion by 2025, representing a compound annual growth rate (CAGR) of 10.3%. On a cumulative basis, the market is anticipated to be worth \$606.4 billion between 2016 and 2025.

Currently, Europe is estimated to be the largest regional market in terms of annual smart city revenue, though Asia Pacific is anticipated to become the world leader by 2019. The vast expansion in the Asia Pacific urban population and growing demands for better quality services and infrastructure are expected to drive demand for smart city technologies in the region. North American cities are currently playing a leading role in the sectors of smart water, smart buildings, and smart government. Additionally, many cities in the region are implementing strong climate action plans in order to mitigate and adapt to the effects of global climate change.

Chart 1.1 Annual Smart City Revenue by Region, World Markets: 2016-2025



(Source: Navigant Research)

In terms of key infrastructure and service areas, smart energy is expected to remain the largest of the five sectors over the forecast period. Smart water will be the fastest-growing sector over the forecast period as the water industry invests in its digital infrastructure to improve water management in the world’s cities. Cities are also looking at the innovative use of technology to address their mobility challenges and improve building efficiency. Investment in smart solutions for city services such as lighting, waste, and social care is also expected to accelerate during the forecast period.

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SCOPE OF STUDY

Navigant Research has prepared this report to present an analysis of the growth and evolution of the global smart city market. The report provides an examination of recent trends and business models currently being utilized in the market, with a focus on the relevant investment cities are making in the energy, water, mobility, buildings, and government sectors. It includes a study of regional trends, national programs, and individual city projects. Regional forecasts of the global smart city market for 2016-2025 are also included.

The report's purpose is not to provide an exhaustive technical assessment of smart city technologies. Rather, it aims to offer a strategic examination of the market with a focus on key economic, business, and social drivers, technology issues, regulatory factors, and the competitive landscape.

SOURCES AND METHODOLOGY

Navigant Research's industry analysts utilize a variety of research sources in preparing Research Reports. The key component of Navigant Research's analysis is primary research gained from phone and in-person interviews with industry leaders including executives, engineers, and marketing professionals. Analysts are diligent in ensuring that they speak with representatives from every part of the value chain, including but not limited to technology companies, utilities and other service providers, industry associations, government agencies, and the investment community.

Additional analysis includes secondary research conducted by Navigant Research's analysts and its staff of research assistants. Where applicable, all secondary research sources are appropriately cited within this report.

These primary and secondary research sources, combined with the analyst's industry expertise, are synthesized into the qualitative and quantitative analysis presented in Navigant Research's reports. Great care is taken in making sure that all analysis is well-supported by facts, but where the facts are unknown and assumptions must be made, analysts document their assumptions and are prepared to explain their methodology, both within the body of a report and in direct conversations with clients.

Navigant Research is a market research group whose goal is to present an objective, unbiased view of market opportunities within its coverage areas. Navigant Research is not beholden to any special interests and is thus able to offer clear, actionable advice to help clients succeed in the industry, unfettered by technology hype, political agendas, or emotional factors that are inherent in cleantech markets.

NOTES

CAGR refers to compound average annual growth rate, using the formula:

$$\text{CAGR} = (\text{End Year Value} \div \text{Start Year Value})^{(1/\text{steps})} - 1.$$

CAGRs presented in the tables are for the entire timeframe in the title. Where data for fewer years are given, the CAGR is for the range presented. Where relevant, CAGRs for shorter timeframes may be given as well.

Figures are based on the best estimates available at the time of calculation. Annual revenues, shipments, and sales are based on end-of-year figures unless otherwise noted. All values are expressed in year 2016 U.S. dollars unless otherwise noted. Percentages may not add up to 100 due to rounding.

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