OpenWorld 2019
Building Smarter Cities

Benchmarking data for sustainable business and financial planning

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Public Sector Trends: IT and Demographic Transformation

BI/Analytics driving integration

Urbanization

75% of Government IT investments go to operations and maintenance
*GCN – April 2017

30 Billion IoT enabled devices by 2020 servicing many aspects of Government and citizen services
*IDC IoT Mapping

68% of world’s population will live in cities by 2050
*UN Department of Economic and Social Affairs (UN DESA)
Regional Trends in Urbanization

By 2050, 68% of the world’s population will be in cities.

*2014 World Urbanization Prospects, UN
Oracle’s Connected City Solution Pillars

Complete, Integrated, Scalable and Secure
Smarter Cities 2025 Survey: Building a Sustainable Business and Financing Plan

Key questions facing today’s local government and business leaders:

What are the characteristics of successful smart cities?

What is the return on smart city investments?

What technological solutions can cities apply to improve economic opportunity and living standards for all citizens?

How can smart cities fund their future plans?
Ten Attributes of Smart Cities

- Smart economy
- Smart environment
- Smart financing
- Smart governance
- Smart infrastructure
- Smart mobility
- Smart payment systems
- Smart public safety
- Smart talent
- Smart public health
The 136 cities represent 55 countries across all regions of the world.

The cities range in population from 35,000 to over 37 million, representing approximately 10% of the world’s population.

The cities range across different levels of economic development, from least developed to highly advanced.

Asian countries included in the research
About the Methodology – Asia

1. Karachi, Pakistan
2. New Delhi, India
3. Mumbai, India
4. Bengaluru, India
5. Hyderabad, India
6. Chennai, India
7. Yinchuan, China
8. Macau, China
9. Beijing, China
10. Shanghai, China
11. Hong Kong, China
12. Seoul, South Korea
13. Tokyo, Japan
14. Taipei, Taiwan
15. Yangon, Myanmar
16. Bangkok, Thailand
17. Kuala Lumpur, Malaysia
18. Singapore, Singapore
19. Tampines, Singapore
20. Perth, Australia
21. Adelaide, Australia
22. Sydney, Australia
23. Melbourne, Australia
The Deep Dive Cities

Leader
Chicago
Tokyo
Copenhagen
Shanghai

Transitioning
Madrid
Moscow
New Delhi
Dubai

Beginning
Athens
Belo Horizonte
Lagos
Benchmarking Smart City Readiness

The economic models draw on the following data:

- Secondary/case study data on the impacts of smart city investments
- City-specific data from the government survey
- City-level demographic data (population, income, etc.)
- Data from the business and citizen surveys

What are the most effective business plans for creating and funding the smart city of the future?

What ROI should citizens, businesses, and governments expect?
Defining Smart City Maturity

The “smart” score was divided into four equally weighted pillars:

- Level of smart city investments
- Use of data analytics
- Application of smart technology
- Self-rating on smart city stage of maturity
Q1 What benefits is your city now gaining from its smart city investments and what benefits do you expect in three years?

Now

1. Ensure safety and security
2. Improve infrastructure
3. **Generate additional revenue**
4. Ability to adapt and innovate
5. Attract residents and tourists

In 3 years

1. **Generate additional revenue**
2. Improve infrastructure
3. Ensure safety and security
4. Ability to adapt and innovate
5. Citizen satisfaction with services
Data is the Rocket Fuel for Smart City Transformation

Please tell us your city’s stage of development in the use of data and data analytics in the following areas:

Level of data maturity by smart city maturity

- Collecting data
  - Beginner: 3%
  - Transitioning: 56%
  - Leader: 94%

- Extracting data
  - Beginner: 3%
  - Transitioning: 52%
  - Leader: 94%

- Integrating data
  - Beginner: 0%
  - Transitioning: 39%
  - Leader: 100%

- Analyzing data
  - Beginner: 0%
  - Transitioning: 49%
  - Leader: 100%

- Providing a mix of data
  - Beginner: 0%
  - Transitioning: 14%
  - Leader: 94%

- Making data accessible and usable
  - Beginner: 0%
  - Transitioning: 50%
  - Leader: 82%

- Monetizing data
  - Beginner: 3%
  - Transitioning: 31%
  - Leader: 71%

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Advanced Data Analytics More Mature in Asian Cities

Please tell us your city’s stage of development in the use of data and data analytics in the following areas:

- **Collecting data**: 46.3% All, 40.9% Asia
- **Providing a mix of data**: 45.6% All, 50.0% Asia
- **Extracting value**: 44.1% All, 45.5% Asia
- **Analyzing data**: 41.9% All, 68.2% Asia
- **Making data accessible and usable**: 41.2% All, 50.0% Asia
- **Integrating data**: 36.0% All, 45.5% Asia
- **Monetizing data**: 27.2% All, 36.4% Asia
Which stage best describes your city's level of maturity in terms of the nine smart city dimensions?

Percentage of cities in advanced or maturing stage by smart city attribute

- Smart Payments: Now - 26.1%, Three Years - 59.6%
- Smart Governance: Now - 23.9%, Three Years - 63.2%
- Smart Infrastructure: Now - 22.4%, Three Years - 58.8%
- Smart Public Health: Now - 22.1%, Three Years - 51.9%
- Smart Talent: Now - 21.7%, Three Years - 50.8%
- Smart Environment: Now - 18.8%, Three Years - 55.0%
- Smart Financing: Now - 18.4%, Three Years - 45.6%
- Smart Public Safety: Now - 17.3%, Three Years - 42.7%
- Smart Mobility: Now - 16.9%, Three Years - 44.3%
Fast Progress in Smart City Programs in 3 years - Asia

Q3b Which stage best describes your city's level of maturity in terms of the nine smart city dimensions?

Percent of Asian cities in advanced or maturing stages by smart city attribute

<table>
<thead>
<tr>
<th>Smart City Dimension</th>
<th>Now</th>
<th>Three Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart Payments</td>
<td>31.9%</td>
<td>59.1%</td>
</tr>
<tr>
<td>Smart Governance</td>
<td>22.7%</td>
<td>70.5%</td>
</tr>
<tr>
<td>Smart Infrastructure</td>
<td>25.0%</td>
<td>61.4%</td>
</tr>
<tr>
<td>Smart Public Health</td>
<td>18.2%</td>
<td>47.8%</td>
</tr>
<tr>
<td>Smart Talent</td>
<td>25.0%</td>
<td>47.8%</td>
</tr>
<tr>
<td>Smart Environment</td>
<td>21.6%</td>
<td>48.9%</td>
</tr>
<tr>
<td>Smart Financing</td>
<td>18.2%</td>
<td>38.7%</td>
</tr>
<tr>
<td>Smart Public Safety</td>
<td>15.9%</td>
<td>40.9%</td>
</tr>
<tr>
<td>Smart Mobility</td>
<td>16.4%</td>
<td>41.8%</td>
</tr>
</tbody>
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Q4

Which of the following digital technologies does your city currently actively use to support its operations, and which do you plan to actively use over the next three years?

<table>
<thead>
<tr>
<th>Technology</th>
<th>Now</th>
<th>Three Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud</td>
<td>91.9%</td>
<td>94.1%</td>
</tr>
<tr>
<td>Data Platform</td>
<td>68.4%</td>
<td>75.7%</td>
</tr>
<tr>
<td>Mobile Apps</td>
<td>86.8%</td>
<td>88.2%</td>
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<tr>
<td>IoT</td>
<td>61%</td>
<td>89%</td>
</tr>
<tr>
<td>Blockchain</td>
<td>4.4%</td>
<td>37.5%</td>
</tr>
<tr>
<td>AI</td>
<td>8.8%</td>
<td>55.1%</td>
</tr>
<tr>
<td>Drones/Roobots</td>
<td>5.9%</td>
<td>23.5%</td>
</tr>
<tr>
<td>V2X</td>
<td>36.8%</td>
<td>10.3%</td>
</tr>
<tr>
<td>VR and AR</td>
<td>8.1%</td>
<td>28.7%</td>
</tr>
</tbody>
</table>
Smart Governance

- Smart governance is the keystone for building a successful smart city.
- To be successful, urban leaders must factor in the expectations of local citizens and businesses.
- Setting a policy framework that encourages innovation and adoption of smart technologies is vital for driving performance.
- Our findings show stakeholders believe their city leaders often don’t focus enough on smart governance.
Smart City Priorities Are Misaligned

What level of priority does your city assign to its smart city initiatives?

New Delhi – Transitioning

Shanghai – Leaders

Tokyo – Leaders

Q5
Where Citizens Believe Priority Should Be – Asia

Q6 What level of priority does your city assign to its smart city initiatives?

New Delhi – Transitioning

Shanghai – Leaders

Tokyo – Leaders

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As Smart Cities Mature, Their Concerns Change

Q7 Please rate the following obstacles that your city faces when implementing smart city plans.

**Beginning**
- Little sense of urgency
- Complexity of procurement
- Political and union challenges
- Lack of culture to drive innovations
- Uncertain ROI: 23.5%

**Transitioning**
- Concerns about cyber security
- Uncertain ROI: 31.6%
- Complexity of procurement
- Difficulty in coordinating across departments
- Desire to avoid disruption in operations

**Leader**
- Concerns about cybersecurity
- Difficulty in coordinating across departments
- Inadequate infrastructure/inflexible legacy systems
- Smart city initiatives seen as helping the rich, not the poor
- Uncertain ROI: 53.3%
For Leaders, Environment, Mobility, and Health Generate Highest ROI

The **ROI on investments** in smart city pillars by maturity stage
Businesses Are Seeing Economic Benefits From Smart City Investments

The economic benefits of investments in smart pillars by maturity stage

- Reducing time needed for city travel and transportation
  - Beginner: 20%
  - Transitioning: 21%
  - Leader: 18%

- Promoting economic development and performance
  - Beginner: 28%
  - Transitioning: 35%
  - Leader: 33%

- Increasing productivity of businesses and residents
  - Beginner: 47%
  - Transitioning: 44%
  - Leader: 48%

- Increasing ability of city to adapt and innovate
  - Beginner: 31%
  - Transitioning: 52%
  - Leader: 49%

- Improving economic competitiveness
  - Beginner: 41%
  - Transitioning: 45%
  - Leader: 45%

- Attracting businesses/private investment
  - Beginner: 16%
  - Transitioning: 20%
  - Leader: 22%
Catalytic Benefits

Over **five years**, smart cities can raise GDP per capita by **21%** and population growth by **13%**

Where will cities be in 3 years?

- **Beginner**
  - Today: 1.2
  - 3 years: 1.8

- **Transitioning**
  - Today: 2.4
  - 3 years: 2.7

- **Leader**
  - Today: 3.3
  - 3 years: 3.6
Roadmap for Smarter Cities

1. Assess stakeholder concerns
   Ensure alignment with stakeholders’ priorities and give them input to gain their buy-in

2. Remove obstacles
   Cities are often held back due to political challenges, cybersecurity worries, inertia, or uncertain ROI.

3. Fully leverage data
   Make sure you are analyzing, and integrating a wide array of data and making it accessible to stakeholders

4. Don’t make cybersecurity an afterthought
   Most cities, especially smart city beginners, are not well prepared for cyberattacks. As cities become smarter, their risks multiply.

5. Keep pace with digital innovations
   Make sure you don’t fall behind on core technologies, like cloud biometrics, and mobile apps, or emerging ones, such as AI, IoT, smart beacons, and chatbots.

6. Lay the IT groundwork
   Install the broadband, shared architecture, and social scaleable systems, as well as the processes and standards, needed to support smart initiatives.

7. Draw on digital ecosystems
   Cities can partner with technology providers and universities or outsource development and implementation.

8. Invest wisely
   Benchmarked cities are allocating about 15% of their operating budgets and 17% of their capital budget to smart city programs.
The data from the Smarter Cities 2025 research has been used to create an in-depth benchmarking tool.

Check out the smart city ROI for 136 cities around the world – each with varying levels of economic development, social and geographic diversity, and smart city “maturity”. Consider how your city might compare.

You can also use the tool to see how the cities in the survey compare against each other.

Click here to access the Smarter Cities benchmarking tool.
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<tr>
<th>Sponsors</th>
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<tr>
<td>Pennoni</td>
<td>SmartCitiesCouncil</td>
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<td>accentureconsulting</td>
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For more information on the Smarter Cities benchmarking tool please visit econsultsolutions.com/esi-thoughtlab/smarter-cities-2025/#benchmarking