

# *Taking the leap into Digital India*

## Smarter cities, safer citizens

*This report has been  
commissioned by Orange  
Business Services*

*August 2015*

**pwc**

## Smarter cities lie at the heart of creating a digital India

In its seventh decade of independence, India stands at the cusp of a major transformation that could lead to unprecedented economic growth paired with radical improvements in the nation's Human Development Index (HDI). Over the past two decades, India's gross domestic product (GDP) has risen by more than 1 trillion USD,<sup>1</sup> bringing millions of citizens into a new cohort we call the emerging middle class. It is estimated that by the year 2050, the number of people living in Indian cities will exceed 800 million.<sup>2</sup> To accommodate this massive urbanisation, India desperately needs to find smarter ways to manage complexities, reduce expenses, increase efficiency and improve the quality of life.

Digital India and smart cities are two foundations of the current thrust to drive India towards decades of superior growth that its population needs. The government of India has allocated 1.2 billion USD in the FY15-16 Budget as the nation plans 100 new smart cities and modern satellite towns under the smart city programme (*Figure 1*). Further, an allocation of 83 million USD has been made to the Digital India initiative.<sup>2</sup>



*The government of India has allocated  
70.6 billion INR (1.2 billion USD)  
for smart cities in Budget 2015-16*

*India plans 100 new smart cities and will  
develop modern satellite towns around exciting  
cities under the smart cities programme*

Figure 1

### Smart cities use information to operate more efficiently, fed by M2M and IoT technology

A smart city uses information and communications technology (ICT) to enhance its livability, workability and sustainability. In a smart city, people have access to a comfortable, clean, engaged, healthy and safe lifestyle. Some of the most highly valued aspects include clean and inexpensive energy, convenient mass transit, good schools, faster emergency responses, clean water and air, affordable housing and commercial space, connectivity, low crime, and access to diverse entertainment and cultural options.

The Internet of Things (IoT) enables cities to turn smarter as they can collect data via a variety of machine to machine (M2M) devices and analyse it using computing technology to monitor, measure and manage the complex systems that facilitate life in urban environments. IoT-enabled interventions can understand how transportation, water and energy systems interact, and optimise their operations, individually or collectively. They can also forecast the impact of changes to the public safety system on adjacent systems such as education, healthcare and social services. In doing so, managers can make more confident and informed decisions that reduce costs and improve living conditions citywide.

In particular, smart city solutions can make the critical infrastructure components and services of a city—administration, education, healthcare, public safety, real estate, transportation and utilities—more intelligent, interconnected and efficient (Figure 2).

### At a glance traditional cities vs smart cities

	The problem	The smart city solution
Planning	<ul style="list-style-type: none"> <li>• Adhoc and decentralised</li> <li>• Cost savings aren't realised</li> <li>• Limited potential for scalability of investments</li> </ul>	<ul style="list-style-type: none"> <li>• Coordinated and holistic</li> <li>• Resources are shared, cost savings are fully realised</li> <li>• Investments are scalable</li> <li>• Improved city</li> </ul>
Infrastructure	<ul style="list-style-type: none"> <li>• Runs inefficiently</li> <li>• Costs more money and resources to run</li> </ul>	<ul style="list-style-type: none"> <li>• Optimised with cutting-edge technology</li> <li>• Saves money and resources</li> <li>• Improved service level agreements</li> </ul>
System operators	<ul style="list-style-type: none"> <li>• Guess at infrastructure conditions</li> <li>• React to problems</li> <li>• Can't deploy resources efficiently to address problems</li> </ul>	<ul style="list-style-type: none"> <li>• Enjoy real-time reporting on infrastructure conditions</li> <li>• Predict and prevent problems</li> <li>• Deploy resources more efficiently</li> <li>• Automate maintenance</li> <li>• Save money</li> </ul>
ICT investments	<ul style="list-style-type: none"> <li>• Piecemeal and siloed</li> <li>• Deliver suboptimal benefit</li> <li>• Don't realise economies of scale</li> </ul>	<ul style="list-style-type: none"> <li>• Centrally planned</li> <li>• Deployed across city departments and projects</li> <li>• Deliver optimal benefits</li> <li>• Provide maximum value and savings</li> </ul>
Citizen engagement	<ul style="list-style-type: none"> <li>• Limited, scattered online connection to citizens</li> <li>• Citizen can't make optimal use of city services (or easily find them)</li> </ul>	<ul style="list-style-type: none"> <li>• Complete and singular online presence</li> <li>• Citizens can easily find and use services</li> <li>• Citizens can participate in smart city initiatives</li> <li>• Two-way communications between government and people</li> <li>• Specialised services focussed on the individual citizen</li> <li>• Citizen can both contribute to and access real-time intelligence</li> </ul>
Sharing data	<ul style="list-style-type: none"> <li>• Departments and functions are siloed</li> <li>• Departments rarely share data and collaborate on initiatives</li> </ul>	<ul style="list-style-type: none"> <li>• Departments and functions are integrated and/or shared</li> <li>• Data is shared between departments and better correlated with other data services</li> <li>• Results are improved</li> <li>• Costs are cut</li> </ul>

Figure 2

Across the globe, the IoT is becoming a reality, positioned to transform the global economy with an expected impact of 4.5 trillion USD by 2020. Analysts expect that the number of connected devices will soar to 27 billion by 2020.<sup>3</sup> Much of the challenges faced by Indian cities too will be tackled through this digital transformation. Here, the public sector, corporations, NGOs and the consumer will increasingly work together to make India's cities smarter places to live and work, creating sustainable change to their economic and social quality of life. We explore just one example to illustrate how digital technologies will play a role in smarter Indian cities.

Road traffic death rates per 100,000 population, by country income status



Figure 3

**1 in 10 lives lost on Indian city roads could be saved via an emergency response system to reach victims sooner during the critical 'golden hour'**

### The equivalent of one-tenth of the population of Dubai is killed as a result of Indian road accidents every year.<sup>4</sup>

Road traffic injuries are the eighth leading cause of death globally,<sup>5</sup> with 1.2 million people dying in traffic accidents every year.<sup>6</sup> The risks of dying as the result of road accidents are lowest in Europe and highest in Africa,<sup>5</sup> middle-income countries being hit the hardest with road traffic fatality rates of 20.1 per 100,000 population (Figure 3).<sup>6</sup>

India has the unfortunate distinction of registering the highest number of road accidents in the world.<sup>7</sup> Every hour nearly 15 lives are lost due to road accidents in India, causing tragedy for innumerable families.<sup>4</sup>

Global research has shown that a large proportion of road deaths could be avoided if victims receive medical attention sooner within the 'golden' first sixty minutes after an accident. Significant data on the subject indicates that communications-driven digital solutions such as automated e-calls could speed up response times significantly, potentially saving thousands of lives.

The time interval between injury and pre-hospital medical care is a major determinant between survival and death. The sooner medical attention arrives, the higher the chances of survival, to the tune of an estimated 2% higher survival rate for every minute of time saved in getting emergency service.<sup>8</sup> In 50% of road fatalities, trauma care made available within 10-60 minutes is extremely crucial to a person's survival and in limiting the extent of injury.<sup>9</sup>

According to a Red Cross Red Crescent survey in 2010, the average emergency response time varies from 10 minutes in high-income countries to up to three hours in some developing countries.<sup>10</sup> Further evidence from developed countries indicates that properly coordinated early rescue and retrieval systems along with in-hospital trauma management can prevent 15-30% of road crash deaths.<sup>9</sup> In cases of heart attacks, a one-minute decrease in the call-to-shock time increases the odds of survival by 57%.<sup>11</sup>

The impact of speeding up response time in countries such as India could be significant. A Bangalore-based study reveals that almost 80% of road accident victims in India do not receive any care within one hour, though in some metros, the average emergency response time is reported as 25-30 minutes.<sup>9,12</sup>

***Improved emergency response time through security and surveillance solutions can help prevent as much as 15% of Indian urban road accident fatalities by making available critical trauma care to victims sooner. A 15-minute quicker response time would save as many as 2,500 lives lost in road accidents every year.***

Digital security and surveillance solutions refer to a comprehensive set of end-to-end applications, devices and analytics, connected by a telecommunications network, which when harnessed together support the emergency response system (ERS) required to coordinate quicker response to a road accident. These solutions typically consist of the following:

- *Surveillance system and equipment such as CCTV cameras* to collect data in the form of images or videos that are required to detect risks and respond to emergency situations
- *Network connectivity* to ensure that data travels from the surveillance systems to data centres and control viewing centres for assessment and analysis
- *Data centres and control viewing centres* that act as data-collection warehouses equipped with intelligent operations capability to ensure real-time collaboration and on-the-spot analytics that can help the agencies prepare for problems, coordinate and manage response efforts

At the time of an incident, an efficient ERS is one that enables an agent to act immediately by raising an alert on a single emergency number for citizens with details of the location and nature of the emergency. This activates the smart city ecosystem instantaneously and saves valuable seconds lost in calling each agency (i.e. hospital, police, fire station and ambulance) separately. A GIS/GPS-based automatic vehicle tracking system further pinpoints location and then assesses and determines the deployment of the closest emergency vehicles. CCTV cameras provide real-time images that could help first responders in better real-time management and mitigation of effects of the road accident through effective and coordinated rescue and traffic control. Intelligent traffic management systems ensure a green corridor to minimise the transit time of the emergency vehicle. Real-time traffic updates to commuters on the route help them avoid the route and reduce congestion thus ensuring rapid access to crash sites and saving precious time and lives (*Figure 4*).



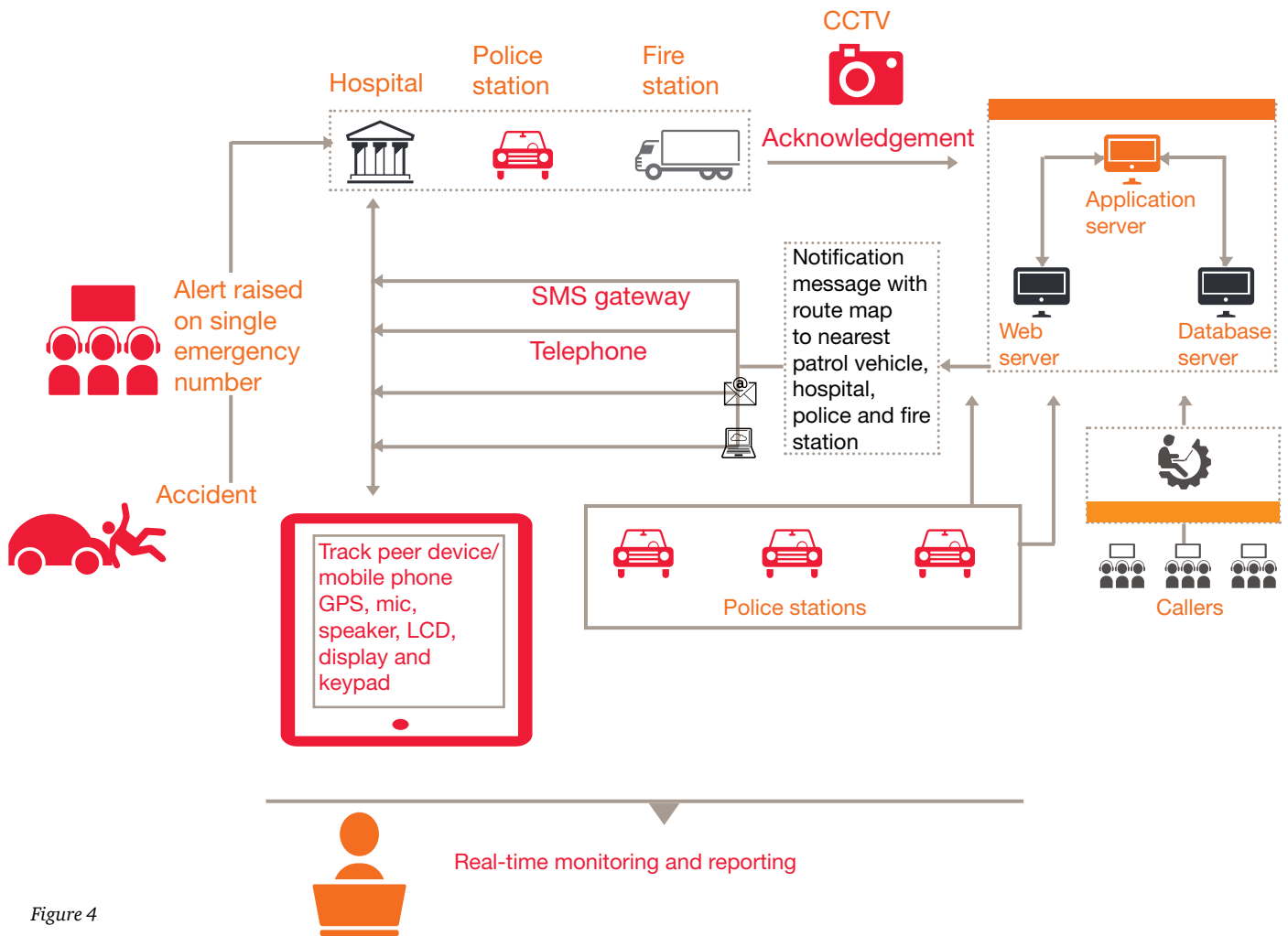


Figure 4

As part of the ambitious project of creating 100 smart cities, the government of India has set a maximum time of 30 minutes for emergency response time following road accidents.<sup>13</sup> Evidence suggests that even shorter emergency response times could be achievable:

- In Chennai, an ambulance transporting a heart for transplant from one hospital to another was given a green corridor with the help of 26 policemen stationed at different intersections, ensuring that it reached its destination within 14 minutes, demonstrating that shorter emergency response times are achievable.<sup>14</sup>
- Similarly, in a pilot project launched by the Indian Ministry of Road Transport and Highways, GPS-enabled ambulances connected to a central control room via a toll-free number were stationed at 20-km intervals on the Gurgaon-Jaipur section of the national highway. These ambulances reported an average response time of 15 minutes for reaching an accident spot, showing that technology can help reduce emergency response times.<sup>4</sup>

The benefits of digital security and surveillance solutions are not limited to addressing road accidents. Common solution functionality can also be used to help combat crime and secure a feeling of safety among citizens. Total surveillance can reduce crime significantly through timely arrests and the deterrence potential of video-recorded evidence. IP-based surveillance solutions with video analytics have the capacity to alert police to abnormalities (such as an abandoned package) detected on the street, strengthening homeland security against acts of terrorism, threats and vulnerabilities. According to 6Wresearch, the India video surveillance market is expected to reach 952.94 million USD by 2016, with a CAGR of 32.49% from 2011-2016.<sup>15</sup>

Security and surveillance solutions which use digital technology, including analytics and positioning technology, have led to significant reductions in crime rates across the world, as the following examples show:

- A reduction of 12.5% and 33% in burglaries and vandalism respectively in Moscow, Russia, was reported within the first six months of the installation of security solutions.<sup>16</sup>
- Chicago recently made national headlines by winning a conviction against a robber who was caught as a result of using facial recognition technology.<sup>17</sup>
- In Surat, a network of 104 CCTV cameras helped the police detect 45 criminal cases including three murders, two kidnappings and 25 thefts, in addition to solving 12 accident cases.<sup>18</sup>
- In Patna, CCTV coverage of roads and traffic intersections is being used to detect traffic signal violations, speeding and lane violations.<sup>19</sup>
- In Tamil Nadu, a free 108 emergency transportation service launched in partnership with the Emergency Management and Research Institute (EMRI) has helped the government save 120,271 road traffic accident victims through timely interventions. The same service has also helped reduce the infant mortality rate from 35 to 22 per 1,000 live births.<sup>20</sup>

### **The value of digital security and surveillance systems lies in enhancing city life through prevention of multiple, complex incidents resulting in a wide range of benefits.**

In addition to saving lives on Indian city roads, integrated security and surveillance solutions across India's emerging smart cities could offer wider benefits:

- Empower police forces' ability to deploy fleet cars more effectively. (*Getting In The Driver's Seat*, a PwC paper commissioned by Orange Business Services, explores how digital solutions are enabling logistics and fleet management companies in Asia to optimise resources and drive up margins.)
- Speed up investigations through integrated crime information, collection and analysis.
- Detect traffic signal violations, speeding and lane violations and administrate e-challans.
- Introduce smart parking, reducing congestion, saving time and increasing convenience.
- Gather data from disparate sources to run analytics and draw insights that help avert terror acts.



*Digital security and surveillance solutions could provide India's metropolitan police forces with a comprehensive real time view of events through a network of wireless connected CCTV cameras and a centralised control centre targeting crime prevention and resolution, effective incident monitoring, predictive analytics and emergency response management. Implementation of these solutions could help prevent as much as 15% of urban road accident fatalities.*

## References

1. Future of India: The Winning Leap, PwC report, 2014. Retrieved from <http://www.pwc.in/future-of-india/index.jhtml>
2. 2015. Smarter solutions for a better tomorrow. Retrieved from [www.smartcitiesindia.com](http://www.smartcitiesindia.com)
3. Machina Research. Retrieved from <https://machinaresearch.com/forecasts>
4. Road Accidents in India, MORTH report, 2013. Retrieved from <http://morth.nic.in/index2.asp?slid=311&sublinkid=141&lang=1>
5. Global status report on road safety, WHO Report, 2013. Retrieved from [http://www.who.int/violence\\_injury\\_prevention/road\\_safety\\_status/2013/report/en/](http://www.who.int/violence_injury_prevention/road_safety_status/2013/report/en/)
6. World report on road traffic injury prevention, WHO and World Bank Report, 2004. Retrieved from [http://www.who.int/violence\\_injury\\_prevention/publications/road\\_traffic/world\\_report/en](http://www.who.int/violence_injury_prevention/publications/road_traffic/world_report/en)
7. Estimating global road fatalities, Global Road Safety partnership study, 2000. Retrieved from [https://scholar.google.co.in/scholar?cluster=17986151466181315138&hl=en&as\\_sdt=0,5&sciodt=0,5](https://scholar.google.co.in/scholar?cluster=17986151466181315138&hl=en&as_sdt=0,5&sciodt=0,5)
8. Impact assessment on the introduction of the e-Call service in all new type approved vehicles in Europe, including liability/legal issues, SMART study, 2008. Retrieved from [www.esafetysupport.info/download/ecall\\_final\\_report.pdf](http://www.esafetysupport.info/download/ecall_final_report.pdf)
9. India and the management of road crashes: Towards a national trauma system, Vol.68, 2006. Abstract retrieved from <http://bioline.org.br/request?is06066>
10. First aid for a safer future, International Federation of Red Cross and Red Crescent Societies report, 2010. Retrieved from [http://www.ifrc.org/PageFiles/92392/First%20aid%20for%20a%20safer%20future%20Updated%20global%20edition%20%20Advocacy%20report%202010%20\(2\).pdf](http://www.ifrc.org/PageFiles/92392/First%20aid%20for%20a%20safer%20future%20Updated%20global%20edition%20%20Advocacy%20report%202010%20(2).pdf)
11. 2005. The price of just a few seconds lost: People die, USA Today. Retrieved from <http://usatoday30.usatoday.com/news/nation/ems-day2-cover.htm>
12. White Paper on Academic Emergency Medicine in India, NDO-US Joint Working Group (JWG) report, 2008. Retrieved from [www.indusem.com/u\\_789.pdf](http://www.indusem.com/u_789.pdf)
13. 2014. Cities with population up to 40 lakh could make Smart City cut, The Times of India. Retrieved from <http://timesofindia.indiatimes.com/india/Cities-with-population-up-to-40-lakh-could-make-Smart-City-cut/articleshow/42335662.cms>



14. 2014. Chennai traffic stops for timely heart transplant to save a life, IBN Live. Retrieved from <http://ibnlive.in.com/news/chennai-traffic-stops-for-timely-heart-transplant-to-save-a-life/479787-62-128.html>
15. 2012. India Video Surveillance Market (2011-2016). Report by 6Wresearch. Retrieved from <http://www.6wresearch.com/market-reports/india-video-surveillance-market.html>
16. Safe Cities: The India Story by PwC report, 2013. Retrieved from [www.pwc.in/en\\_IN/in/assets/pdfs/.../safe-cities-the-india-story.pdf](http://www.pwc.in/en_IN/in/assets/pdfs/.../safe-cities-the-india-story.pdf)
17. 2014. Connected Chicago catches crooks, controls rats, SmartCitiesCouncil. Retrieved from <http://smartcitiescouncil.com/article/connected-chicago-catches-crooks-controls-rats>
18. 2014. More Surat areas under e-surveillance, The Times of India. Retrieved from <http://timesofindia.indiatimes.com/city/surat/More-Surat-areas-under-e-surveillance/articleshow/44833024.cms>
19. 2013. Post by Bihar DGP Abhayanand. Retrieved from <https://www.facebook.com/Abhayanand.DGP/posts/552736194762516>
20. 2014. Saving one life every 30 minutes, The World Bank. Retrieved from <http://www.worldbank.org/en/news/feature/2014/03/10/saving-one-life-every-30-minutes>

# Notes



## **About PwC**

PwC\* helps organisations and individuals create the value they're looking for. We're a network of firms in 157 countries with more than 195,000 people who are committed to delivering quality in assurance, tax and advisory services. For more information, please visit [www.pwc.com](http://www.pwc.com)

PwC refers to the PwC network and / or one or more of its member firms, each of which is a separate legal entity. Please see [www.pwc.com/structure](http://www.pwc.com/structure) for further details.

## **Contacts**

### **Singapore**

***Maheshwar Venkataraman***

Email: [maheshwar.venkataraman@sg.pwc.com](mailto:maheshwar.venkataraman@sg.pwc.com)

Phone: +65 9830 5063

### **India**

***Shashank Tripathi***

Email: [shashank.tripathi@in.pwc.com](mailto:shashank.tripathi@in.pwc.com)

Phone: +91 9819678900

***Neeraj Katariya***

Email: [neeraj.katariya@in.pwc.com](mailto:neeraj.katariya@in.pwc.com)

Phone: +91 9910024512

***Diwakar Gupta***

Email: [diwakar.gupta@in.pwc.com](mailto:diwakar.gupta@in.pwc.com)

Phone: +91 9810902746

***Neetika Choudhary***

Email: [Neetika.choudhary@in.pwc.com](mailto:Neetika.choudhary@in.pwc.com)

Phone: +91 9873934684

[www.pwc.sg](http://www.pwc.sg)

This document has been prepared in accordance to the engagement commissioned by Orange Business Services Ltd. PwC's services were performed and the document was developed in accordance with the Engagement Letter. No copies of this document will be made available to third parties except as has been agreed in the Engagement Letter.

© 2015, PwC. All rights reserved. \*In this document, "PwC" refers to PricewaterhouseCoopers Consulting (Singapore) Pte Ltd., which is a member firm of PricewaterhouseCoopers International Limited, each member firm of which is a separate legal entity