SMART CITIES:
AN ENABLER FOR INDIA'S ENHANCED COMPETITIVENESS

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- Smart Cities is an extremely nascent concept in India. They refer to efficient transportation of people and goods and a reliable and efficient supply of energy making them extremely livable.
- GoI has announced: (a) 100 smart cities under the Smart Cities Mission and 500 smaller towns under the AMRUT mission; and (b) Make in India campaign, which includes key new initiatives designed to facilitate investment and build best-in-class manufacturing infrastructure.
- Efficient collaboration between city, state and national government as well as India's citizens will realise Smart Cities.

INTRODUCTION:

The trends in India over next 20 years - population growth and the rural to urban migration, pose severe strain on existing urban habitat infrastructure. Adopting right fit Smart Infrastructure is the key enabler for city authorities makes for Smarter Cities that provides citizens with the Quality of Life, Environmental Sustainability and Economic Competitiveness .Typically a Smart City would entail a host of sub components Energy Distribution &, Smart Grid, Intelligent Building Management Solutions, Citizen Safety & Security, Integrated Command & Control Centers, Mobility solutions - Metros, Intelligent Traffic Management, Water and Waste water automation, Predictive Clean Air tools and integrated City development.The future of smart cities will be shaped by the Internet of Things as a networking technology and by smart data as a resource..

As the world moves towards Industry 4.0, India must move with it – by turning to smart technology that can maximize quality, productivity, speed and efficiency, and gain a vital competitive edge in cost and innovation. Smart City Development is a huge positive for the manufacturing industry primarily because these thriving living sustainable ecosystems help to attract and retain talent and also bring in competiting investments.

These City Infrastructure technology enablers coupled with a Political Will, Right Governance, Transparent Procurement norms-QCBS, SWISS Challenge models, Strengthening ULB finances, Innovative funding models to attract private investments, Skill Development and integrated approach between various Ministries, will support the faster development of SMART Infrastructure to make Cities Smarter & the key enablers for India's enhanced competitiveness.

ANALYSIS & DISCUSSIONS:

India is undergoing rapid growth, with urbanization on the rise all across the country. As emerging technologies continue to develop, more opportunities arise for cities to leverage new technological processes and data sources for new and existing public infrastructure. Estimates suggest that urban population is set to grow to more than 500 million by 2030, and the contribution of India's urban areas to its GDP will be 75% by 2030 (up from 63% in 2018).

Thus the key challenge with rapid urbanization essentially would be to improve the quality of life boost economic activity and increase sustainability, as the economy continues to grow. Cities must be more responsive and resilient to attract talent to build local and national economies. Investments in Smart Infrastructure which makes Cities and towns smarter will help citizens balance Quality of life, Environment Sustainability and Economic Competitiveness.

Intelligent infrastructure encompasses of a digital ecosystem to make cities and countries more livable and sustainable. Today the number of connected devices has surpassed the number of humans on the planet. These intelligent devices generate massive amounts of data transforming life and business

across all sectors. However, much infrastructure has yet to be transformed by the information age. Instead, in most places, trains, power systems, buildings, buses, and roads have hardly changed in nature. Some digital systems have been incorporated but we have only just begun to unlock the potential of fully digitized, electrified, information-enabled, intelligent infrastructure. Doing so will be key to meeting the India's present and future sustainable development challenges.Secure energy supplies, flexible mobility, and energy efficient building control: the requirements for a modern and sustainable infrastructure are growing. Digitalization enables the implementation of innovative solutions that make urban areas better places to live.

CURRENT SCENARIO:

Building smart infrastructure in India is more complex than in its western counterparts. Most of the cities and towns do not have access to basic infrastructure, let alone digital infrastructure. In addition, there is a lack of power accessibility; India has the largest un-electrified population in the world. This is a major factor that pegs India back in its competitiveness, according to the World Economic Forum (WEF).

The report further classifies India as one of the 35 countries in a "factor driven" economy. What this means is that in spite of the huge infrastructure deficit, India outperforms Sub-Saharan and other countries on the GCI. One of the reasons for this is possibly India's unconventional path of economic development. India is heavily dependent on the service sector to drive its economic growth thereby leapfrogging over the manufacturing-led stage of development. India's manufacturing sector with an 18% share of overall GDP compares poorly with its Asian peers. This is in spite of various strengths that the country possesses like a large domestic market base, a regulated monetary system, strong base of entrepreneurs. The manufacturing sector lags due to a lack of enabling infrastructure as well as restrictive labour laws.

But despite the challenges India has moved up to 40th place on the Global Competitiveness Index (GCI) in 2017-18, from 71st place in 2014-2015. This was largely due to improvement in infrastructure, health and education post 2014, when the newly elected government increased public investment and sped up approval procedures to attract private resources.

THE ROAD AHEAD:

The Indian government estimates that an infrastructure investment of $4.5 trillion will be needed till 2040 to meet the current infrastructure deficit. The Indian government has also set a goal of increasing the share of manufacturing sector to 25% of GDP from its current 18%. It is estimated that by 2025 India's manufacturing sector can grow to be a $1 to $1.5 trillion dollar sector.

Creating Smart Infrastructure to make Cities Smart will require a collaborative effort between city, state and national governments, as well as from India's citizens. Coupled with the delivery expertise of the private sector, smart technologies will be the differentiator in improving the overall quality of life. Smart infrastructure uses advances in sensors, controls and software. This allows cities, service providers and citizens to access the full potential of both existing and new urban infrastructure systems.

Moving towards building smart Infrastructure would propel us towards an efficiency-based and then an innovation based economy. This is provided that we are able to overcome macroeconomic roadblocks such as currency weakness, global trade protectionism, rising inflation, and political stability.

The Indian government is cognizant of the fact that to be future-ready, infrastructure development is essential across all parts of the country. As of today, there are 100 Smart cities under the Smart Cities Mission and 500 smaller towns covered under the AMRUT mission.

Smaller cities will play a key role in sustaining the growing urbanization levels in India, as the larger cities are already reaching levels of population saturation. In addition, since most of the rural population migrates to bigger cities, it causes an unaffordable level of living with unjustified housing prices and a lack of basic living standards. This is why it is important to look at India as a whole. Satellite towns

like Gurgaon and Manesar were set up to offer superior employment options, education, health care & other social infrastructure. They provide an alternative hub of economic activity, and offset the strain on the current large metros.

Smart Infrastructure will help bridge the gap between its innovative strength and technological readiness, thereby leveraging it across the wider economy. With intelligent buildings, intermodal transportation solutions, distributed energy systems and intelligent grids, we create value through digital connection. Thereby, we can create cities of the future, making us globally competitive.

Smart cities will be characterized by power grids that will be able to balance electricity supply and demand. This will start with buildings that learn occupants' energy needs, integrate vehicle batteries into their energy forecasts, respond to changing weather conditions, and automatically alter their behavior to maximize their efficiency. The world's most advanced buildings have brains – a kind of central nervous system that balances and reconciles competing interests such as energy minimization, occupant comfort, and grid stability.

Buildings can become generators instead of consumers of energy. Consider this fact: An estimated 15 billion square feet of space is expected to be constructed in the upcoming years. If 40% of the energy is consumed in buildings, consider the savings brought about by a green or smart building that consumes 30% less energy than a conventional building.

India's energy use has almost doubled since the turn of the century. And the country will contribute more than any other to the rise in global energy demand over the next 25 years. Whether it's residential and office buildings in New Delhi, technology complexes in Bangalore, or transport systems in Mumbai – the modern world depends on a safe, clean and efficient energy supply

In addition to the power grid, the transportation infrastructure is also critical to the success of the manufacturing industry. India's highways and railroads are currently over-capacity, and the congestion adds to the inefficiency of the manufacturing sector. Many manufacturers are dependent on the airline industry, for both supplies of their raw materials as well as delivering their end products to consumers. This is a significant cost to their business, impacting the margins of the overall industry – especially as oil prices continue to rise. Investing in a smart transportation network in cities and across the country would reduce the travel time between locations and provide a cheaper logistical option

To maintain and improve our standards of life, one of the critical areas that need to be urgently addressed is the optimization of water usage as well and reduction of waste. This is measured as Non-Revenue water, and refers to water that is lost (through avenues such as leaks, theft and inaccurate meters) before it reaches the customer. Currently, India's non-Revenue Water is 34% - significantly higher than the global average of 28%. Smart infrastructure would be particularly useful in cities which continually face water shortage issues. Better infrastructure improves manufacturing, which in turn leads to better infrastructure - thus creating a cycle of improvement. It is widely agreed that automation makes manufacturing processes more efficient and leads to fewer defects.

CONCLUSIONS:

The consortium approach for smart cities is the way to enhance India's competitiveness. A consortium approach can bring a depth of expertise as well as integrated thinking across sectors, right from the planning stage through to the execution of projects. The government has hinged these developments on private sector investments, but the private sector is reluctant to pursue these opportunities, due to challenges in dealing with multiple authorities and taking on a higher level of risk. In order to provide a level playing field with technology as a key driver, we need innovative business models, both for procurement and financing. Innovative business models are needed for the private sector to participate. It is also imperative for the government to be a risk taking partner which provides guarantees, subsidies. These business models could be a consortium approach, quality cum cost based approach (QCBS) basis for evaluation, O&M along with lifecycle costs, SWISS challenge mode and Hybrid annuity models to name a few.

Enablers

- *Emphasis on integrated approach to Smart Infrastructure Planning and Implementation – appropriate technology leveraging Digitalization.*
- *Integrated approach from Central and State Ministries.*
- *Transparent Procurement with emphasis on "Right fit" technology, life cycle QCBS, consortium approach with O&M.*
- *Strengthen revenue sources of ULBs – Allow them to retain share of the taxes collected to build infrastructure.*
- *Attract Private Funding - Innovative models to entice private sector investments.*
- *Leverage Digitalisation / IOT.*
- *Positive regulatory environment – Heavy Deterrents to violation of rules.*
- *Capacity building- Skill Development for all verticals and services.*

Siemens has been helping to build the infrastructure of this country since the last 150 years. There is significant untapped potential in smart infrastructure, which is where we hope to make a difference with our expertise. Our focus areas are in the digitalization of cities and power grids, and we are committed to develop India's infrastructure to meet global standards.

Sources of Information: Information from Public Domain, Government data, Consultant Reports on India's Urbanization, Siemens internal Strategy team reports, COC Cities London data.