

Memorandum on Smart Cities

One of the most basic objectives of the Smart City initiative is to provide easy mobility, work ability and pollution free environment replete with the basic amenities. If we take the example of Mumbai city alone having area of 4355 km having a population burden of 22 million people with 50% population staying in slums, which is disastrous. An ambitious project was initiated in and around the year 1997 which later was named as the SRA project. However, the success of this project has been minimal. The Indian cities have a worse problem of ever increasing population over a period of time due to mass migration to the cities in search of employment. Hence, even if we decide upon the framework for a smart city today we are totally clueless about the efficacy of this framework may be ten years down the line. Hence when we conceptualize the basics of a smart city it is very important that we fix a population to area ratio for every smart city so that there is a check on populations migrating to city thereby the existing population is not falling short of amenities and facing congestion issues as there is no further scope for increase in area. The concept of smart city needs to address the issues of existing cities, the newly proposed and implemented ones and the proposed ones. The existing ones need special attention to undergo the process of transforming into a smart city as it remains the most challenging task. Against this backdrop, the government has recently provided for the addition of Rs 48,000 crore for the smart cities project and Rs 50,000 crore for the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) mission. The smart cities project will cover 100 cities and will provide for Rs 100 crore per year, for the next five years for selected cities with a population of over 1 million, while AMRUT will cover 500 cities with a population ranging from 100,000 to 1 million. The challenges here include the lack of empowerment of mayors; the rotational reservation clause that does not provide an incentive to invest time and energy in creating lasting projects, as they do not have a means of getting re-elected and their tenures are short; and the lack of capacity in building viable self sustaining projects, such that funds available to ULBs remain unutilised to the extent of over 25 per cent. The greatest need of the hour, though, is a change in mindset – a long-term vision would enable the introduction of lifecycle costing and an integrated approach over a silo approach. Despite all obstacles, the first steps have been made in the right direction with the empowerment of the state, with city planning becoming a priority, inculcation of financial discipline and of course, the political will, which comes straight from the office of the Prime Minister. Further discussed are some of the propositions which need to be kept in backdrop while deciding the concept of smart cities.

Integrated Planning for Cost-Effective Solutions

It is observed that states and municipalities often focus on a requirement individually on one on one basis. As a result, we sometimes assess and implement the best alternative to solve one problem at a time without full consideration of all the other obligations. This approach may have the unintended consequence of constraining a municipality from implementing the most cost-effective solutions in a sequence that addresses the most serious issues first. Encouraging municipalities to work with the states to engage local partners regarding all of their civic related obligations in an orderly manner is the need of the day. A comprehensive and integrated planning approach needs to be implemented to provide greatest opportunity for identifying cost-effective and protective solutions and implementing the most important projects first.

Integrated planning will put municipalities on a critical path to achieve success in identifying efficiencies in implementing sometimes overlapping and competing requirements that arise from separate civic issues, including how best to make capital investments and meet operation and maintenance requirements. Integrated planning also can lead to the identification of sustainable and comprehensive solutions, such as green infrastructure.

In embracing an integrated approach to tackle civic issues it is not suggested that existing regulatory or permitting standards that protect communities depend be lowered. Rather, it is simply suggested that such an approach will help municipalities responsibly meet their obligations by maximizing their infrastructure improvement rupees through the appropriate sequencing of work.

Green Infrastructure

When we talk about green infrastructure one need to be kept in mind 1. Sewage management 2. Energy efficiency 3. Pollution reduction. Multiple benefits are associated with green infrastructure, which strongly encourages related innovative technologies, approaches, and practices to manage the above. There have been many successful examples of cities who utilize green infrastructure to meet regulatory requirements while also benefiting from green jobs, neighborhood enhancements and more sustainable communities. Community partnership program needs to be launched to identify communities with which the municipality will work on green infrastructure implementation issues. Technical assistance resources need to be developed for partnerships on using green infrastructure on sites and slowly infiltrating soils and evaluating codes and ordinances for barriers. The current economic times make the need for sensible and effective approaches even more pressing to pursue innovative and cost effective solutions to the above challenges.

Open Urban ICT Platforms for Smart Cities and Communities

Opening urban ICT platforms are a pre-requisite to support fast take-up of smart solutions in cities to allow many stakeholders of a city to participate and for different vendor solutions to be easily integrated. Objective of such a platform is to accelerate the opening up of the Smart Cities Market, ensure suitable industry input, and an open dialogue with cities and communities in order to take into account their needs and concerns, to develop the Urban Platform open market by creating competition for supply side and confidence for demand side. The urban Platform means the implemented realisation of a logical architecture/content/design that brings together (integrates) data flows within and across city systems and exploits modern technologies (sensors, cloud services, mobile devices, analytics, social media etc ... providing the building blocks that enable cities to rapidly shift from fragmented operations to include predictive effective operations, and novel ways of engaging and serving city stakeholders ... in order to transform, in a way that is tangible and measurable, outcomes at local level (e.g. increase energy efficiency, reduce traffic congestion and emissions, create (digital) innovation ecosystems). The rapid deployment of ICT technology in urban infrastructures and the growth of the Internet of Things will lead to new service portfolios, especially using real-time information. Urban data provided by cities and infrastructure providers will enable new business models and service portfolios. A common data and service ontology will ensure a seamless commercialization of these new service portfolios.

Urban Water Resource Management

Integrated urban water management (IUWM) is described as the practice of managing freshwater, wastewater, and storm water as components of a basin-wide management plan. It builds on existing water supply and sanitation considerations within an urban settlement by incorporating urban water management within the scope of the entire river basin. IUWM seeks to shift urban water management away from ad hoc solutions to a more integrated approach. IUWM within an urban water system can also be conducted by performance assessment of any new intervention strategies by developing a holistic approach which encompasses various system elements and criteria including sustainability type ones in which integration of water system components including water supply, waste water and storm water subsystems would be advantageous. Simulation of metabolism type flows in urban water system can also be useful for analysing processes in urban water cycle of IUWM.

IUWM is commonly seen as a strategy for achieving the goals of Water Sensitive Urban Design. IUWM seeks to change the impact of urban development on the natural water cycle, based on the premise that by managing the urban water cycle as a whole; a more efficient use of resources can be achieved providing not only economic benefits but also improved social and environmental outcomes. One approach is to establish an inner, urban, water cycle loop through the implementation of reuse strategies. Developing this urban water cycle loop requires an understanding both of the natural, pre-development, water balance and the post-development water balance. Accounting for flows in the pre- and post-development systems is an important step toward limiting urban impacts on the natural water cycle.

Sewage Management

The scope of sewage management has evolved throughout history with changes in socioeconomic conditions, city structures, and the environment. Today, sewage infrastructure that is well planned and operated supports urban sanitation and related activities. Effective sewage management is essential for nutrient recycling and for maintaining ecosystem integrity. It is also important for:

Improving the environment through proper drainage and disposal of wastewater;
Preventing floods through removal of rainwater;
Preserving receiving water quality.

The sewage treatment process facilitates the achievement of water quality objectives. In addition to nutrient recycling, advanced treatment of wastewater often includes associated unit processes which support the optimization of resource use. Some of these unit processes include the conversion of sludge into various beneficial by-products, and the process of extracting thermal energy from sewage and wastewater. In addition, the sewage collection system can be used as a conduit for optical fibre cables and other communications infrastructure.

Sewage Works Planning and Administration

Sewage works should be planned and executed by municipalities in collaboration with other levels of government. The authority for the construction and management of treatment plants, trunk sewers and branch collectors varies depending upon the jurisdictional arrangements in a given country. The Metropolitan Government carries out the construction and management of these facilities within the regional sewage system, while the municipalities themselves are responsible for connecting the branch sewers with the trunk sewers.

Water Recycling Master Plans

Some cities have established a water recycling master plan to ensure the efficient use of precious water resources. Under such a plan, water-related measures are examined from the viewpoint of water recycling and all activities within the city are carried out in a manner consistent with the master plan. The objectives of a water recycling master plan should include the creation and nurturing of a water cycle that has a minimal impact on the environment while fostering a beneficial relationship between humans and nature. This involves the establishment of efficient water and wastewater systems within the city and ensuring sufficient flexibility to cope with the possibility of environmental emergencies and possible disasters such as earthquakes and drought.

Sustainable Urban Transport Management

Strategic objective of local communities is to achieve the transport system configuration which recognizes four vital dimensions:

the transport dimension – adequate balance between public and private transport share in satisfying the needs of all the market segments,

ecological dimension – retaining of the overall volume of pollution caused by the transport modes at an acceptable level,

economic dimension – creation potential of new financial resources by the solutions of giving “value for money” and the capacity for inducing the desired behaviour (demand) of the users through fair charging mechanisms (without discrimination),

social dimension – providing the citizens with transport system which suits their needs.

Since it is difficult to achieve an ideal system, in modelling of the urban public transport the acceptable solution is also the one of establishing certain compensation among these domains in compliance with the socio-economic and cultural reality of every specific urban district, and the conditioned political option and the accompanying financial support as the result of interaction between the local, regional, and national levels of interventions.

Work life balance

Work-life balance of an employee is largely determined by the nature of his job, the industry in which his company operates and the employee leave benefits offered by the company. However, the civic infrastructure and other features of a city or town also play a role in improving the work-life balance of an employee. Civic administrations in

smart cities can contribute to the work-life balance of the employees by improving commuting or travel infrastructure, encouraging amusement centers, parks, museums etc. For example, setting up infrastructure for seamless transportation would reduce commuting time for office goers and hence increase the amount of time available for spending with family.