

City	Bhubaneswar	Contact person	R. Vineel Krishna, I.A.S.
Concerned Department / Authority	Bhubaneswar Smart City Limited	Contact person	Saroj Kumar Swain, GM (Technology & Projects)
Theme	<i>Urban Flooding Management</i>		
Background	<p><i>Bhubaneswar, the capital city of Odisha recently witnessed a flooding after a bout of sudden rainfall (220mm rainfall in less than 18 hours, in July 2018), which was unexpected by any one residing in the city. The city turned into a flooded landscape with water gushing into homes and water logging all around. This was due blockage of storm water drains or illegal developments in the low lying areas of the city.</i></p> <ul style="list-style-type: none"> • The flooding was primarily due to inadequate local drainage conditions of the city; • The city drainage system contains 10 natural drains flows west to east which ultimately join Kuakhai river through Gangua nalla; • Three major physical structures Railway track, Puri-Cuttack highway and Daya West Canal located on the east of the city, acts as a barriers against the free flow of runoff to ultimate disposal point; • Absence of interim or temporary storage facilities such as detention ponds, retention ponds etc., are leading to negative impacts on the downstream water channels; • The present capacity of natural drains carry maximum of 20mm/hr rainfall intensities, whereas the rainfall analysis of past 30year rainfall data predicts rainfall intensity of 41mm/hr having return period of 2 years; • The average annual rainfall of Bhubaneswar city is 1500mm,; • About 40% of average annual rainfall occurs in two months July & August makes city vulnerable to flooding and water-logging; • The city administration has identified about 57 locations which are highly vulnerable in the event of moderate to heavy rains; • The inundation depths up to 1m are very common in most of the vulnerable areas in every monsoon season; 		
Description of the specific challenge	<ul style="list-style-type: none"> • <i>Areas which are essentially created for storm water drains are being trespassed for development purposes resulting in obstruction of water flow.</i> • <i>Regular dumping of solid waste and industrial waste into natural and man-made drains resulting in decreased flowing capacity of drains.</i> • <i>Unregulated development of infrastructure in low lying areas.</i> 		
Desired outcome	<p><i>Profiling of the city for appropriate sizing of the storm water drains. It would also include installation of appropriate sensors across the city to gauge the rainfall and monitor the flood water level in prone areas of the city. The central platform should alert on priority for susceptible areas where high water levels may cause danger or inconvenience to citizens.</i></p> <p><i>The system should also facilitate and guide in infrastructure improvement requirements in the city to averse such conditions in future.</i></p>		

	<p><i>Drainage design and implementation should follow integrated approach by incorporating the conventional drainage system with Water Sensitive Urban Design guidelines with an aim to collect, store and recharge</i></p> <p><i>To develop drainage O&M manual (or) Standard Operating Procedures documents and to ensure thorough implementation of it</i></p>
Current status	<p><i>The Planning Authority of the City is already working on profiling of the low lying areas in the city along with removal of encroachments over drain areas in the city. Also, technological intervention through installation of 10 nos. of environmental sensors has been made to cover the city area for rainfall assessment. It is envisioned to install more rain gauges, if deems appropriate as per requirement of the system. The City is already equipped with state of the art command control centre for monitoring and response in case of such situations.</i></p>
Estimated timelines	<p><i>The rainy season in Bhubaneswar starts from Mid June and continues till end of August. It is estimated to initiate the implementation on early basis and complete the solution before the start of rainy season.</i></p>
Procurement procedure	<p><i>Several parts of the solution, like central platform etc. may be procured within the contract of Master System Integrator (MSI), already engaged by Smart city company for implementation of Smart Technological Solutions. Sensors and other filed devices may be procured separately by the Company through public procurement.</i></p>
Key local stakeholders	<p><i>Bhubaneswar Municipal Corporation</i></p> <p><i>Bhubaneswar Development Authority (the Planning Authority of the City)</i></p> <p><i>Bhubaneswar Smart City Limited (the Smart City Company)</i></p> <p><i>Works Department, Odisha Government (the Public works department of the state)</i></p> <p><i>Odisha State Disaster Management Authority</i></p>
Any other remarks	<p><i>The solution should be based on open data framework and with capability to integrate with City Level Platform for integration of all smart solutions to analyse and provide decision making support based on real time/historical information obtained from the field.</i></p>