OPINION

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BUILDING A CLIMATE-RESILIENT AND EQUITABLE WATER SECTOR

Climate change undermines our water infrastructure resiliency and reliability on a daily basis, and focusing on marginal changes to the current system without looking at its shortcomings, perpetuates the status quo. The once-through water infrastructure model developed over a century ago, combined with a siloed and fragmented governance structure, has created an inflexible system incapable of withstanding various social and environmental crisis. Unimaginable climatic, health or socio-economic events, such as the current COVID-19 pandemic, and recent water system failures in Texas and Mississippi, highlight flaws in our existing water system.

It is clear we cannot continue facing today's challenges and solve tomorrow's problems with yesterday's solutions. The Biden-Harris "BuildBack Better" plan resonates under current circumstances. There is an opportunity to forge new solutions. As communities grapple with building climate-resilient and equitable water infrastructure and recover from the current pandemic, the following three transformative ideas are important to consider:

While considering investment strategies, it is critical to rethink the water sector's antiquated business model, and governance structure

Harness the digital revolution to build a resilient water infrastructure network. As the sector moves towards a hybrid infrastructure model, mixing centralized and decentralized systems with gray and green infrastructure, it is important to know where and when these solutions are needed, and how to coordinate management. Newfound digital capacity and smart systems help track, inform and enable this transition, giving water utilities a better understanding of long-term water demand trends to guide infrastructure planning. The goal should be to avoid over-investing in costly solutions when small, distributed, modular and adaptive solutions are available.

Redefine the boundaries of water infrastructure. The boundaries of water infrastructure are slowly expanding. Water reuse systems are transforming conventional once-through water use networks. Green infrastructure and nature-based solutions such as horizontal levees, recharge ponds and permeable pavements are proving to be vital climate adaptation strategies. Moreover, soft infrastructure such as data, monitoring systems, information technology and decision support tools are key in managing a physical infrastructure network. Investment strategies must be all encompassing, embracing these solutions as part of a broader network.

Harness sector interlinkages. Using infrastructure interconnections and vulnerabilities to drive both financial and political support for infrastructure solutions can create resilient outcomes. For example, while the One Water movement aims to break down water sector silos, it also highlights opportunities for bridging infrastructure boundaries across sectors. Recovering energy from wastewater, using parking for stormwater capture, green infrastructure to improve social wellbeing and stormwater management are a few examples of intertwined water, energy and transportation infrastructure boundaries. Some of these interconnections were on display during the recent extreme cold events in the south and south east US, when water and energy systems failed simultaneously. It is imperative to remember these interlinks while debating how to build future cities and where to spend infrastructure dollars.

Ultimately the business model that today's water sector depends on is outdated and unable to weather environmental and economic stressors, let alone galvanize the paradigm shift needed to meet tomorrow's challenges. While considering investment strategies that enable equitable social and economic growth, it is critical to rethink the water sector's antiquated business model, and fragmented governance structure. We should not miss a national opportunity to shrink the access gap by investing in both soft and physical water infrastructure. As we emerge from this pandemic, these three ideas can help us build a set of climate ready and equitable water infrastructure to carry us through the next century.