prevents the re-charging of groundwater, another important source of drinking water in many places. This is particularly disconcerting as the effects of climate change become more apparent. The conveyance-centric design creates a few problems. Firstly, it means that the infrastructure is not equipped to retain water for use. This is particularly disconcerting as the effects of climate change become more apparent.

The problem with urban environments is that they are full of impervious surfaces, such as roads, buildings, and sidewalks, which cause water to run off quickly into storm drains and rivers. This reduces the amount of water available for recharge and can lead to flooding.

Research associate Celina Balderas Guzman says, “merge urban functionality with hydrological functionality.” This means integrating the design of urban spaces with the natural hydrological cycle. For example, designing buildings with green roofs can help to absorb and retain rainwater, reducing the amount of water that runs off into storm drains.

Balderas Guzman and her team are engaged in a two-year project, titled “Urban Undersides: Designing Hydrologically Sustainable Urban Infrastructures.” The project is funded by the Water, Agriculture, Food, and Security (J-WAFS) program at MIT. The team is working with architects, engineers, and city planners to develop new designs that can help to retain and reuse water in urban environments.

The researchers are also working on developing new guidelines for the design of urban constructed wetlands, which are areas of land that are deliberately designed to hold water and encourage natural processes like filtration and purification. These wetlands can help to improve water quality, support local ecosystems, and provide recreational spaces for urban residents.

Balderas Guzman notes that one of the challenges of this work is that the team is working with a complex system that is not well understood. So Nepf, Berger, and their multidisciplinary team of designers, engineers, and scientists are working to develop new models that can help to predict the behavior of these systems.

The team envisions that the designs they are developing will be scalable and adaptable to different urban environments. They hope to see larger datasets available for them, which will allow them to refine and improve their designs. They are also working towards making the designs publically accessible.

The researchers are hopeful that their work will help to create safer, healthier, and more sustainable urban environments. They believe that by integrating hydrological functionality into urban design, they can help to create more resilient, eco-friendly urban infrastructure designs. The researchers look forward to seeing the range of application of the designs.