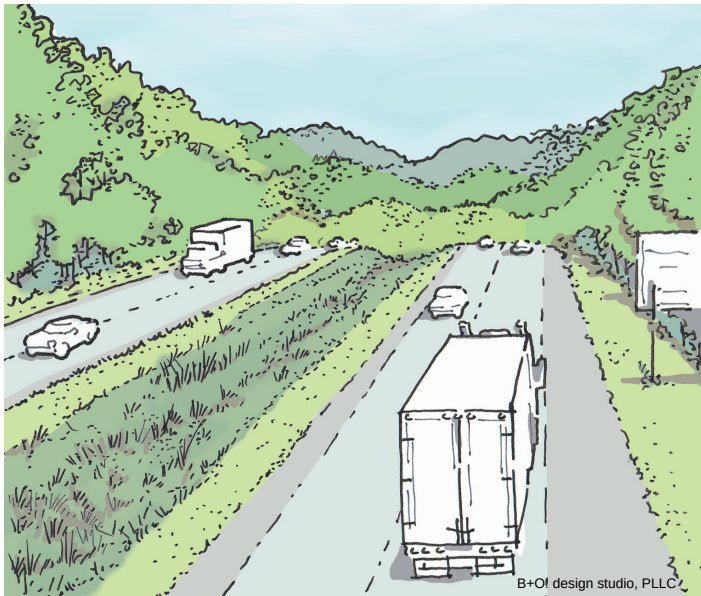


# Nature-based Stormwater Strategies work for ROADWAYS

Nature-based Stormwater Strategies for highways, roads and streets utilize natural and built features to infiltrate stormwater runoff, reducing its rate and volume. Techniques like grassed roadside shoulders, sand filters and others can reduce flooding and improve water quality by reducing the volume of polluted stormwater runoff flowing into waterways.



An inland highway uses grassed swales to collect and infiltrate runoff, which reduces flooding and discharge to surface waters.



A coastal road uses curb cuts to guide runoff to a roadside infiltration system. Permeable paving on the bike path disconnects runoff and a living shoreline was installed to reduce soundside erosion to protect the roadway.

## Nature-based Stormwater Strategies

### Infiltration Trenches

Infiltration trenches direct stormwater to soak into subsurface soils for space limited applications.

### Bioretention Cells

Bioretention cells are vegetated depressions that rapidly infiltrate and filter runoff through the soil.

### Vegetated Swales

Swales are shallow, vegetated, linear channels that absorb and filter stormwater runoff.

## Nature-based Stormwater Strategy Project Examples

### Edenhouse

On the Chowan River, 400 feet of degrading bulkhead was removed and replaced with coastal marsh.



The restored habitat will help protect the shoreline by the NC Wildlife Resource Commission boat ramp.

### NC 211 - Lockwood Folly River

NCDOT reduced stormwater runoff to the Lockwood Folly River by implementing nature-based techniques in the right of way of NC 211.



The bioswale (*background*) infiltrates runoff and reduces pollutants entering the river while the bioswale outlet structure (*foreground*) captures overflow during heavy rain events.

### Fayetteville Green Streets

Permeable pavement and infiltration bump-outs absorb rainwater and prevent stormwater runoff.



Infiltration bump outs, or roadside rain gardens, capture rain water and provide green spaces in urban areas.

### Moor Shore Road

A living shoreline was implemented in Kitty Hawk, NC to improve water quality and protect the road from flood damage and erosion.



The offshore sill reduces wave action, while marsh grasses help stabilize the shoreline to prevent erosion.

## Why use Nature-based Stormwater Strategies?

"State DOTs are in the business of maintaining their coastal highways and nature-based solutions should be considered as a part of that long-term commitment."

**U.S. Department of Transportation  
Federal Highway Administration**

"...roads and travel surfaces present perhaps the largest urban pollution sources and also one of the greatest opportunities for green infrastructure use."

**U.S. Environmental Protection  
Agency**

"North Carolina's transportation systems must not only meet the needs of the traveling public, but they must support the development of sustainable communities. The N.C. Department of Transportation understands and realizes the stewardship role it can fulfill."

**N.C. Department of Transportation**