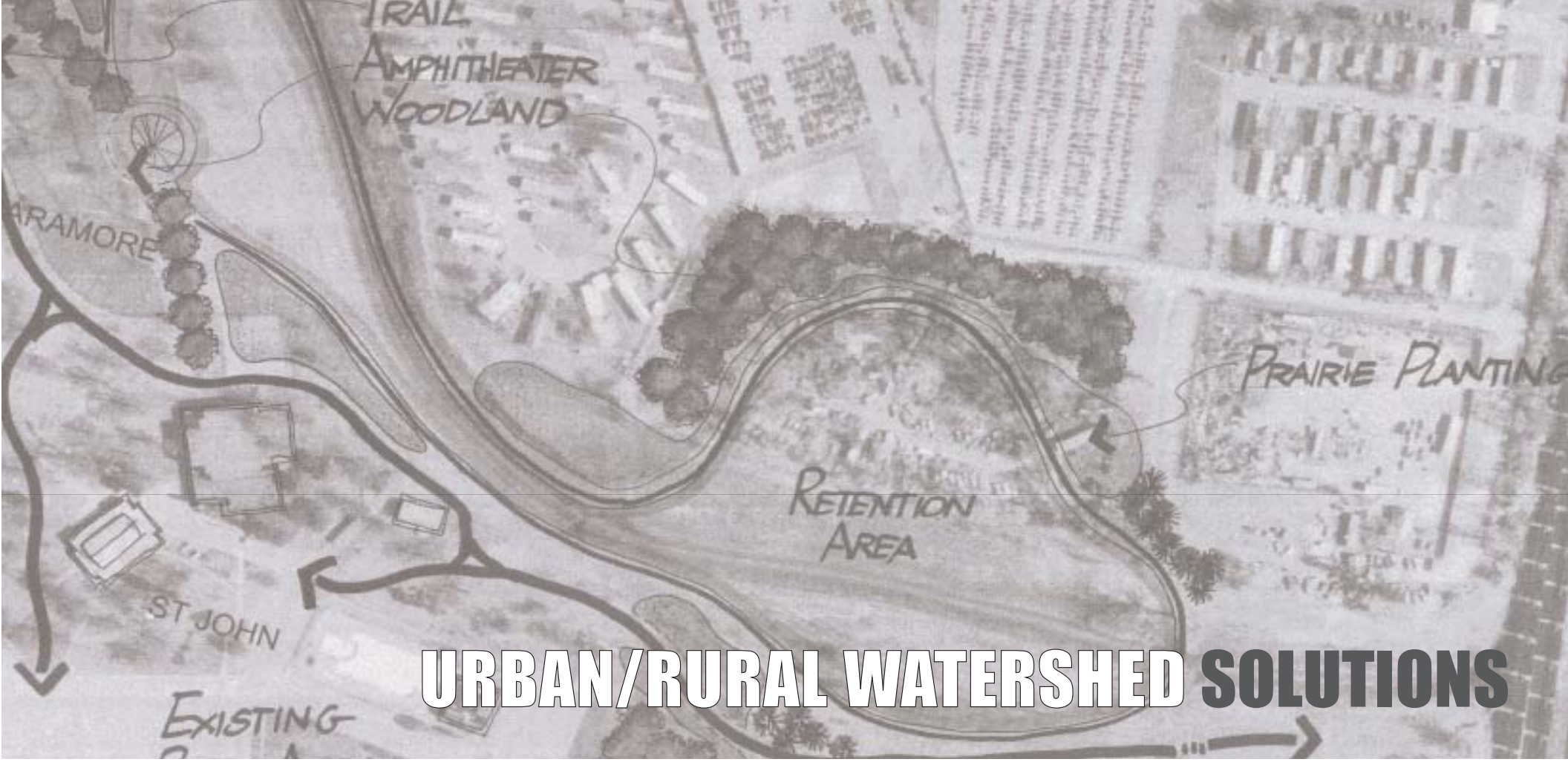
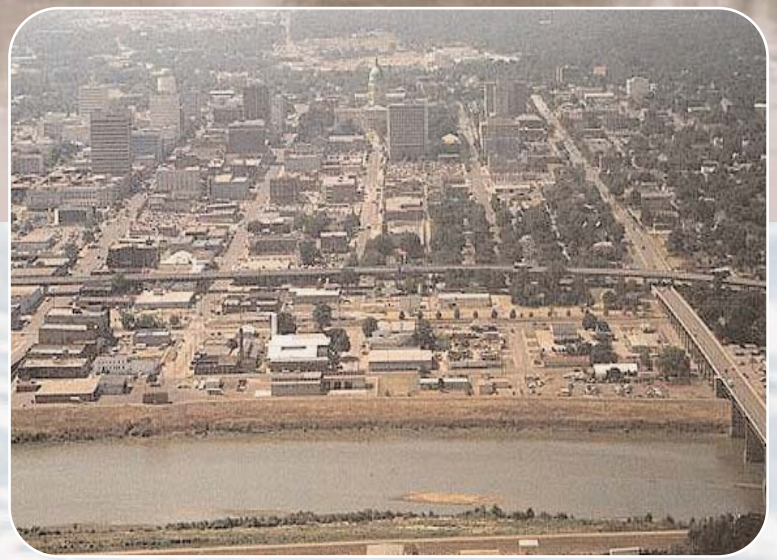


URBAN/RURAL WATERSHED SOLUTIONS

TOPEKA

STORMWATER:



Rain falls from the sky and lands on roads, buildings, lawns, parking lots, sidewalks, and houses. Are expensive concrete channels and pipes the only way to handle the resulting stormwater? NO! Today "green technologies" that use plants and soil provide new solutions to the old problem of stormwater management.

How much water are we talking about? One inch of rain over one acre is about 27,000 gallons. Over the entire city of Topeka that translates to 940 million gallons. It's easy to conclude that a very big underground pipe is needed to carry nearly a billion gallons of water from the city. In Topeka, stormwater with all of its contaminants is now channeled into drains that eventually empty into the Kansas River.

As a community grows, land that was once covered with trees, grasses, shrubs, and crops, rapidly becomes covered by houses, businesses, and pavement. Rain concentrates in gutters, driveways, parking lots, and streets and is collected by stormdrains. However, another approach can be used. Soil that is covered with trees, shrubs, and grasses remains permeable and allows water to be detained and absorbed into the ground.

Stormwater management improves water quality:

- **In existing community developments**
- **In future community developments**
- **In the entire watershed**

Existing Developments

Topeka's *Jackson and Van Buren Streets Stormwater Project* began as a typical retrofit of a stormwater drain system. The existing pipes could not handle high volumes of runoff and Topeka, like many other cities, planned to tear up the street and install a larger pipe. Instead Topeka will leave the existing pipe in place and install a vegetated surface drain system along the street that incorporates trees, shrubs, grasses, and flowers rather than bricks and concrete. Parking lots and walkways will also be paved with porous materials that allow some of the rainfall to percolate into the soil, reducing the amount of runoff and the need to replace the existing stormwater pipes.

Buildings can also be designed differently. For example, the planned 9th Street Garage does not need to greatly increase the amount of impervious surface. Topeka is looking at the possibility of planting a "rain garden" on top of the garage to absorb much of the rainfall and allow the rest to drain conventionally.

Future Developments

As Topeka grows in population it will need to expand into the surrounding area. Planning now for future stormwater needs allows for creative solutions that can provide many other benefits.

Topeka's Old Soldier Creek is an example of a natural drainage that has been modified within the urban environment. About half of this watershed is already developed, but the rest is still in cropland. However, it will inevitably be developed for industrial and residential use. The conventional solution would be to build expensive concrete "trickle channels" throughout the area. Instead, Topeka is evaluating an alternative that would re-establish natural vegetation within the watershed and use Old Solider Creek and a constructed wetland in Garfield Park to add wildlife habitat and recreation opportunities, while handling the additional runoff from the area as it develops.

Watershed Perspective

Typically, communities only occupy part of a large watershed. Communities affect their watershed and are, in turn, affected by the activities of others. Topeka's watersheds are shared with the surrounding agricultural communities. Topeka is looking beyond its basic responsibility of managing stormwater runoff and treated wastewater.

In cooperation with the Kansas Center for Agricultural Resources and the Environment (KCARE), USDA National Agroforestry Center (NAC), Kansas State Forest Service, Kansas Department of Health and Environment (KDHE), Kansas Water Office, Kansas Biological Survey at University of Kansas, and Kansas State Research & Extension, Topeka is developing a model that will consider the sources of runoff, hydrologic flow paths, and the uptake of water and nutrients by trees, shrubs, and grasses to design buffers that both reduce stormwater volume and improve water quality for the overall watershed.

Union Pacific Overland Station Depot

Photo courtesy of Colorado Wilderness on Wheels.

Topeka: Learning Together

The Union Pacific Overland Station Depot is being renovated to showcase the significance of the Union Pacific Railroad and Oregon Trail in the development of the Great Plains. To increase public awareness of stormwater and wetland issues, an all-abilities accessible interpretive trail and stormwater management wetland will be constructed in north Topeka, adjacent to the historic Depot. Community residents will be able to see first-hand examples of new, modern, and environmentally friendly ways to manage stormwater.

It's time for stormwater management systems to provide more to Topeka residents. A concrete channel that simply passes stormwater onto our downstream neighbors is not enough. By incorporating "green technologies" future stormwater systems can protect our rivers and lakes from contaminants, while moderating runoff peaks, enhancing wildlife habitat, and providing outdoor recreation opportunities.

For More Information

Mark Green, P.E., Superintendent, Water Pollution Control Division Department of Public Works. 1115 N.E. Poplar Avenue, Topeka, Kansas 66616-1389. Phone: 785-368-3851, ext. 519. Fax: 785-368-3855. E-mail: *mgreen@topeka.org*

KANSAS BIOLOGICAL SURVEY · KANSAS WATER OFFICE · K-STATE Research and Extension · KANSAS FOREST SERVICE · KCARE · KCSAAC · KDHE · THE CAPPER FOUNDATION · USDA National Agroforestry Center