# Green Infrastructure & Stormwater Management
# CASE STUDY

## Iowa Green Streets Pilot Project

**Location:** West Union, IA
**Client:** City of West Union, Iowa; Iowa Department of Economic Development
**Design Firm(s):** Conservation Design Forum
**Landscape architect/Project contact:** David Yocca, ASLA
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**ASLA Chapter:** Illinois

### Project Specifications

**Project Description:** The Iowa Green Streets Pilot Project is a community-wide sustainability initiative to serve as a catalyst for further investment in the historic downtown of West Union, Iowa. The project began with a visioning workshop in October 2007 when Iowa's Department of Economic Development (IDED) completed a Technical Assistance Visit to advise West Union about the potential for multi-purpose pedestrian-scale streetscape improvements. The result of the initial visioning and the subsequent Conceptual and Schematic Planning was a Streetscape Master Plan, which has led the Pilot Project, now in the construction documentation stages. The project includes the complete renovation of 6 downtown blocks and will replace aging water,

storm and sanitary sewer infrastructure. The project also showcases innovative sustainable design strategies as a model for other communities, including permeable pavements, pedestrian crosswalk treatments, rain gardens, energy efficient lighting, and a district-wide geothermal heating and cooling system.

**Project Type**:
Transportation corridor/streetscape
Part of a redevelopment project

**Design features**: Rain garden and porous pavers.

**This project was designed to meet the following specific requirements or mandates:** To meet funding criteria, developer/client preference, Iowa's Statewide Urban Design and Specifications Program (SUDAS) standards were followed.

**Impervious area managed:** greater than 5 acres

**Amount of existing green space/open space conserved or preserved for managing stormwater on site:** less than 5,000 sq/ft

**The regulatory environment and regulator was** supportive of the project.

**Did the client request that other factors be considered, such as energy savings, usable green space, or property value enhancements?** The client requested the design consider energy savings, usable green space, property value enhancements, walkability, and be supportive of the downtown retail environment. They also requested the design include local materials, labor, and craftsmanship.

## Cost & Jobs Analysis

**Estimated Cost of Stormwater Project:** <$5,000,000 (Public funding: Federal, state, regional, local, General Obligation Bonds: $176,319, Revenue Bonds: $692,180, U.S. Dept. of Energy: EECGB Grant: $837,500, State of Iowa: Main Street Challenge Grant: $440,000, State of Iowa: I-Jobs Grant: $1,175,000, State of Iowa: Watershed Improvement Fund: $500,000, Fayette County: $10,000, West Union Main Street Organization: $10,995, U.S. EPA: Climate Showcase Grant: $500,000, State of Iowa: IDNR I-Jobs: $100,000, State of Iowa: IDALS I-Jobs: $500,000, State of Iowa: CDBG: $1,000,000, State of Iowa: IDOT Rise: $2,327,034)

**Related Information:** Design: $782,300

**Was a green vs. grey cost analysis performed?** Yes, one of the analyses that was performed was for the cost of the porous unit paving system. The following table (http://www.cdfinc.com/xm_client/client_documents/WestUnionLifeCycle.pdf) was developed to

compare the cumulative cost of this system versus that of a traditional bituminous asphalt surface. Our analysis showed a payback period of approximately 15 years.

**Cost impact of conserving green/open space to the overall costs of the site design/development project:** It did not affect the overall costs.

**Cost impact of conserving green/open space for stormwater management over traditional site design/site development approaches (grey infrastructure)?** Did not influence costs.

**Number of jobs created:** The impact of this project on local job creation and retention will be immediate and significant. West Union is a small rural town that recently suffered the loss of their two largest employers. They are committing funds to this project in a very difficult time, because they know it is an investment in their future. The total capital investment is expected to total $11,690,000 over the next two years. Using a recommendation from the May 2009 report of the President's Council of Economic Advisors (http://www.whitehouse.gov/assets/documents/Estimate_of_Job_Creation.pdf) which establishes that for every $92,000 of government spending, 1 job is created, West Union's Green Streets Pilot project will create 127 jobs.

**Job hours devoted to project:**

Planning and Design: 4,200
Construction: 15,000
Annual Maintenance: 160

## Performance Measures

**Stormwater reduction performance analysis:**

The permeable paver system will allow transmission of water through the pavement surface and into the aggregate base below. This will reduce runoff volumes and rates and improve water quality. Runoff is temporarily stored in the base and slowly evaporated and released to the storm sewer system. There will be approximately 250,000 sq/ft of permeable pavers which are suitable for pedestrians and vehicles as well as providing storm water management.

The paver and bioretention system will virtually eliminate runoff for storm events up to 1 inch and reduce storm runoff volumes by 20% for 2-year storm events. Peak flows will be reduced by 95% for the 2-year event. Sediments, hydrocarbons, nutrients, and other urban pollutants are filtered from runoff and runoff temperatures are reduced. Over 90% of the sediments and metals that are typically found in urban runoff will be removed by the system. They offer safety features for drivers since there is less ponding of water on the driving or parking surface and skidding, hydroplaning, and ice buildup are diminished.

West Union's unique sense of place is evident in its recognition of distinctive natural surroundings in an area known for its beautiful natural scenery. Currently rainwater and pollutants concentrate in drainage ditches and ultimately discharge north into Glover Creek or south into Otter Creek just below the city limits. This activity has the potential to threaten the trout streams which are bounded by important watershed districts. The protection of these habitats is integral to West Union's green vision.

Both of these cold water creeks support fish and other aquatic species that are sensitive to environmental (i.e., water quality) conditions. By eliminating surface runoff from the majority of storm events and treating the storm water, the overall stream quality and ecology should be improved. Pristine recreational water areas, especially a coldwater bass and trout streams, improve the day-today quality of life for residents and visitors.

**Community & economic benefits that have resulted from the project:** The project is currently under construction, so the economic benefits have not yet accrued. Already, the project has raised the image of the city as a "green" and forward thinking community, and several new businesses have been interested in locating in West Union.

Additionally, many of the local businesses will be able to expand their services to construct these sustainable features. For example, drilling geothermal wells is very similar to drilling other types of wells and installing a radiant heat snow-melt system is something most plumbers are capable of doing. Other activities will likely require the formation of new enterprises, or partnerships. Permeable pavement is a market that is rapidly developing in the Midwest. Permeable unit pavers are currently manufactured by only a handful of plants in Iowa, Illinois, Wisconsin, and Minnesota. Projects like this one will encourage existing ready-mix concrete plants in the region to expand their services. It will also encourage traditional paver installers to develop a new set of skills in order to compete in this market.

## Additional Information

**Links to images:** All photos are from Conservation Design Forum:
http://www.cdfinc.com/Project?project_id=136

The West Union Green Streets project is a pilot project used as a demonstration for green infrastructure throughout the United States. This is one of the first applications of a complete suite of green infrastructure practices to date. The project was supported by the state economic development department and secured over $7.5 million in funding from various programs.