



The Partnership is reaching its fourth stage of water quality and flood prevention planning



Stage IV will study five options for meeting comprehensive regional flood prevention, water quality and land use policy goals.

The Stage IV study addresses technical water quality and flood prevention issues in the Papillion Creek Watershed. Stormwater management is being studied under current and future full “build-out” conditions. Build-out means the construction of homes, buildings, roads, parking lots, etc., on all remaining rural land in the watershed. Scenarios being studied include:

- Baseline (2004) land use conditions with no new flood management improvements.
- Full build-out land use conditions with no new flood management improvements.
- Full build-out land use conditions with inclusion of LID strategies only.
- Full build-out land use conditions with inclusion of potential new regional detention structures only.
- Full build-out land use conditions with inclusion of LID strategies plus potential new regional detention structures.

Objective scientific findings for these scenarios will be evaluated and can be used to develop the most effective solutions for our watershed.

- Stage IV uses hydrologic and hydraulic models at key locations in the watershed for finding combinations of methods to improve water quality and prevent flooding.
- Stage IV builds upon the six stormwater management policies that were created during Stage III.
- Stage IV efforts will help support the implementation of a Papillion Creek Watershed Plan.

Increased development in the watershed requires action to improve water quality and reduce the threat of flooding.

Water quality and flood prevention in a watershed depend on three factors: its size and shape, the rate of the water running downstream and land use in the area. Our watershed’s size and shape cannot be changed, but the methods studied by Stage IV can address the other two factors, rate and land use, to improve water quality and flood prevention.

Stage IV will use models to evaluate the impact of a system of regional detention sites and LID strategies to improve water quality. Water quality basins are already for the sole purpose of water quality improvement and trapping sediment. The study will qualitatively evaluate factors that affect water quality using the following parameters:

- Erosion Potential – estimate the potential for sheet/rill erosion, stream bank erosion and shoreline erosion.
- Sediment Yield – measure sediment amounts and storage requirements for developing and finished basins.
- Bacterial Reduction – estimate the relative percent of reduction in bacterial counts in water bodies.
- Nutrient Reduction – estimate the relative percent of reduction in total nitrogen and phosphorus, which may contribute to poor water quality.

The Papillion Creek Watershed has a history of flooding, and the need for additional flood control measures becomes more vital as urbanization continues in the watershed. The Stage IV study examines a variety of methods to manage storm events in the watershed, including:

- *Low Impact Development* (LID) strategies – techniques to minimize stormwater impact and retain water where it falls. Examples include rain gardens, vegetation swales and permeable pavement.



Evaluating Solutions

- *Water quality basins* – smaller structures that reduce runoff and pollution in the basin before they get downstream. Basins capture and hold the first flush of runoff, which has the most pollutants, according to many sources.
- *Regional detention* – larger structures designed to capture a large amount of water, well in excess of the first flush of runoff.

Different combinations of these methods will be measured for their ability to meet objectives for water quality and flooding and associated cost impacts. Models of these combinations will be created with current 2004 land use and “full” build out of the watershed modeling future use conditions.

The public will be involved in recommending solutions.

Stakeholders can evaluate and discuss the results of the study and provide direct feedback on the range of options that may fit the needs of our communities. Public meetings are planned for fall 2007 to explain the results of the study and gather feedback. An advisory group of stakeholders and subject matter experts from throughout the watershed is also slated to evaluate the results and provide recommendations. Public and technical recommendations from the study will be provided to elected officials in each jurisdiction in the watershed.

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Photos: (Front) Flooding of Big Papillion Creek in 1999 near One Pacific Place; (Back) Low Impact Development and Water Quality basins

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