



# Stormwater and an Urban Forest

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## Part I: Overview of Business

The mission of the Department of Public Works is to operate and maintain infrastructure and provide essential services for everyday life and economic growth.

The Department of Public Works provides day-to-day maintenance of the City's infrastructure services in the area of enterprise sewer maintenance and facility operation, levee reconstruction for Birdland and Central Place, sanitation, street maintenance, city storm and sanitary sewer operations, and emergency response for snow and ice, flood mitigation, and windstorm mitigation.

## Part II: Job Specifics

Increases in stormwater negatively impact the capacity of our sewage treatment systems, especially in cities that have combined stormwater and sanitary sewers. Des Moines is one such community that has some combined sewers. Stormwater and runoff is an area of this department that is a constant issue that needs attention year round. You are a team of the DM PW that is in charge of creating a proposal for the City Council as a plan to decrease that amount of Stormwater runoff in Des Moines.

## Part III: Introduce the Problem

Historically, stormwater runoff only occurred during large storm events when the rate of rainfall or snowmelt was greater than the rate at which water could be absorbed into the soil. With the ever increasing development and urbanization, the area of impervious surface in the US is approximately 40,005 sq. mi. with an additional 316 sq. mi. being added each year (Xian et al., 2011). According to the GIS Division of the City of Des Moines, the city has approximately 58,000 acres, and approximately 14,000 of those are impervious surfaces. This equates to 24% of surface area in Des Moines that does not allow infiltration of water.

Design a neighborhood in Des Moines that would help solve this issue from getting worse. Be sure to include residential both rental and owners, businesses that are privately owned and commercially owned, and streets and sidewalks. A recreational area can be included. You will need to research stormwater issues, impervious surfaces and natural and human resources that could be used to solve the issues you discovered. Your team will be given a budget and pricing list.

## Part IV: Background

Students will need to do informational readings/research on problems associated with stormwater to a mostly concrete metropolis area like Des Moines. Understand vocabulary associated with this topic such as, impervious.

DM Public Works conducted research for the need of tree inventory, and then collected information on various established Des Moines Neighborhoods of the amount of water that fallen vs the amount the trees in that area absorb. Other areas of concern, such as Urban Heat Island effects, temperature data was also collected and could be an extension to the storm water problem for students.

Possible resources:

<https://www.epa.gov/soakuptherain/soak-rain-trees-help-reduce-runoff>

<https://desmoinesia.treekeepersoftware.com/index.cfm#/admin/home>

Readings on pervious communities such as Ankeny

## Part V: Business Solution

The city conducted a tree inventory, invited ISU students to do research in this and other issues in order to support the need of resolutions to such problems as stormwater runoff. And is putting together an informational problem solution magazine for the public (my current project)

## Part VI: Student Solutions

Students will come up with a blueprint that will include pervious surfaces and vegetation plans that include native plants and trees.