



**Credit Valley
Conservation**
inspired by nature

Low Impact Development



*Climate Change Solutions
for the Credit River*

Student Guide

Low Impact Development - Student Guide

Activity # 1 - Watch the Video "Low Impact Development" (creditvalleyca.ca/lidvideo) and answer the following viewing guide questions:

1. How does climate change affect our cities?
2. Why isn't the current stormwater infrastructure adequate?
3. Name three types of Low Impact Development (LID) facilities.
4. How does Low Impact Development help with climate-change related flooding?

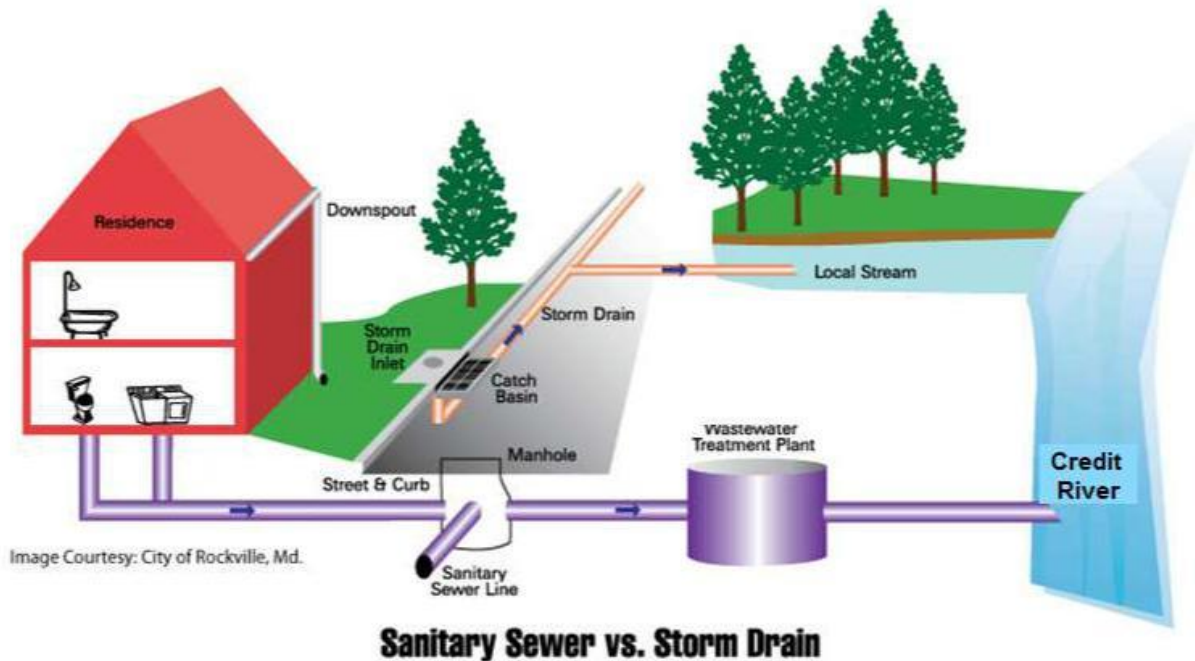
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Climate Change and Flooding in Our Cities

Urban areas are covered in hard surfaces – buildings, parking lots, driveways and roads. When a forest or meadow becomes a city, the impermeable surfaces interrupt the water cycle and create problems with stormwater runoff. Climate change increases runoff volumes by increasing the frequency of extreme rain and snowfall events.

Increased runoff, loss of natural areas that absorb and filter water, and combined sewer overflows result in pollution which can affect aquatic ecosystems, recreational uses, and source water for drinking. Further impacts include flooding, erosion, altered water balance in streams and rivers, and loss of groundwater recharge (which is important especially for communities relying on well water).

Road-related pollution found in stormwater includes oil, grease, metals and chemicals from vehicles, road salt and sediment. In summer months, thermal pollution can be a major concern.



In urban areas, rain is generally removed from roads through storm drains and underground pipes, and discharged directly to rivers or lakes without being treated first.

In more recently developed areas, rain is drained to stormwater ponds, where it is held before being discharged, and some level of treatment is provided. Roadside ditches designed for conveyance perform this function in older and more rural areas.

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However, these methods do not adequately treat the pollution from roads or restore the natural water balance. Many of these systems are aging and were not designed to accommodate increased volumes of runoff due to urbanization and climate change, which results in flooding that causes damage to roads, homes, businesses, and nearby infrastructure. Even up-to-date systems using conventional pipes and ponds cannot meet targets for quantity and quality control and thermal pollution from stormwater ponds can shock receiving streams.

Part of the answer to the problem of urbanization and climate change is to restore and mimic the natural water cycle through a combination of natural and constructed features known as green infrastructure or low impact development (LID). Some of the measures to manage stormwater volumes can include rain gardens, permeable pavement and urban tree planting.

Your Turn to be the Scientist – Grey to Green

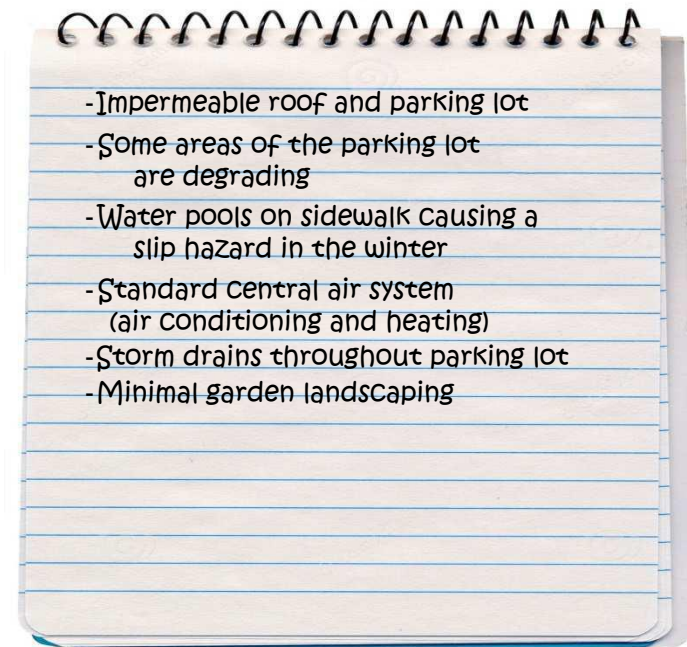
A movie theatre situated near the Credit River is concerned about climate change impacts. They are already experiencing challenges such as ice formation in the parking lot and pedestrian paths in the winter, rising costs in energy usage and flooding and degrading of the asphalt parking lot.

They would like to “climate change proof” their buildings and property to minimize damages that could happen during extreme weather events. You have been hired as a consultant to advise on how to protect their assets against climate change.

You have conducted a survey of their building, the property and acquired a map (red star indicates the main building and red line outlines property boundaries). You have also made some notes (below).



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Using what you learned in the video and the attached case studies, create a report for the CEO of the movie theater. Your report must include:

- a. Climate change impacts that could potentially affect the theatre building and property.
- b. A plan for installing LID features and description of how they will improve the facilities.
- c. The economic and social benefits of installing LID features.