

Huron River Report

The newsletter of the

Huron River Watershed Council

PROTECTING OUR WATER TOGETHER SINCE 1965

Speaking Up for Density

Why It's Good for Watersheds

Environmental groups often speak out against increased residential and commercial development. More development brings with it a host of problems for our rivers, lakes, streams, wetlands, and natural areas. However, many planners and watershed ecologists are encouraging higher density development in many areas of the watershed. Why?

IMPACTS OF DEVELOPMENT ON THE WATERSHED

In an undeveloped watershed, most rainfall and snowmelt either infiltrates into the ground or is taken up by vegetation. Much of the water that infiltrates into the ground eventually makes its way into streams or lakes through groundwater seeps or springs. Water taken up by vegetation cycles back into the atmosphere through evapotranspiration.

Because of these processes, runoff from

natural areas is negligible, except after the largest storms. These ecologically intact systems provide services to the community, including: groundwater recharge; pollutant removal; temperature reduction; erosion control; air purification; flood and drought control; wildlife habitat; increased property values; and recreation. However, as development within a watershed increases, these important natural functions are compromised.

Development brings with it increases in impervious surfaces, such as rooftops, roads, driveways, parking lots and other



Low density developments consume more land and create more impervious surface per household than do compact developments

surfaces that prevent rainfall and snowmelt from infiltrating into the ground. Rainwater directly runs off these surfaces into lakes and streams. In highly impervious watersheds, waterways receive a flood of runoff water just after rainfalls or large

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snowmelts, but are deprived of water during dry times.

These high flows and low flows are problematic for streams. High flows can damage aquatic habitats and scour stream banks, while low flows deprive aquatic life of water and oxygen. Runoff water is also much warmer than groundwater and carries with it soil and whatever substances it may pick up from the landscape along the way, such as fertilizer, pesticides, oils, and other pollutants. The system loses its capacity to provide the ecological services mentioned above.

IMPACTS OF IMPERVIOUSNESS

All of these impacts on water quality are directly related to the amount of imperviousness in a watershed. Dozens of scientific studies have documented this relationship, and they consistently have found that water quality begins to suffer when a watershed exceeds 8–10% imperviousness.

IMPERVIOUSNESS AND DENSITY

The best way to keep imperviousness levels low watershed-wide is to group development into smaller, compact areas because the 8-10% imperviousness threshold is easily reached with relatively low densities — about 1 dwelling unit per 2.5 acre. Low density development requires a longer and wider road, driveway, and parking network (along with the accompanying development of nearby commercial services and employment centers). This development results in an actual increase in impervious surfaces to accommodate the same number of households in low densities. In fact, research shows that subdivisions designed in a typical pattern, where one single family residence is located on its own lot, increase imperviousness by 10–50% compared to developments that group the same number of households onto smaller areas.

In addition, low density development fragments the region's remaining natural areas, leaving small pockets of forest and wetlands to survive amidst large swaths of subdivisions and shopping

malls. Small, fragmented natural areas are more susceptible to incursion by non-native invasive plants. Also many species of wildlife (such as many songbirds, like the scarlet tanager) require large, deep, undisturbed forests and wetlands for survival.

AN OUNCE OF PREVENTION

Prevention is key when it comes to land use planning and water quality. It is less expensive and better for the creek to plan ahead by identifying areas for compact development and protecting open space that maintains the natural water cycle. By contrast, having to treat water runoff from development that already has occurred is much more expensive. For instance, the City of Ann Arbor is engaged in restoring the Malletts Creek Watershed, an area with approximately 23% imperviousness that has experienced most of the problems outlined above for highly impervious watersheds. Restoration activities are slated to cost \$24.2 million over 6 years.

While stormwater treatment practices can mitigate impacts of development, they cannot restore watershed quality to that of an undeveloped watershed. Studies have shown that pollutant levels in runoff from a developed site with stormwater treatment practices still will exceed levels running off of an undeveloped site.

BUILD IN AND UP, NOT OUT

Those interested in truly maintaining the ecological and hydrological integrity of the watershed may find themselves on the opposite side of development debates than they would be otherwise. For instance, high density developments proposed in already urbanized areas (known as “infill”) can help reduce imperviousness watershed-wide. These developments provide housing, employment, recre-



photo: HRWC

Well designed, higher density developments consume less land and create less impervious surfaces than low density developments.

ation, and/or shopping for larger numbers of people on much smaller amounts of land than almost any automobile-dependent suburban development could in the countryside. The proposed Lower Town development off Broadway and Wall Streets, and the Corner Street Apartments on the corner of State and Washington, both in Ann Arbor, fall into this “infill” category. In addition, people traveling to and from these developments will be able to walk, use public transportation, or will not have to drive as far, thus reducing the need for new pavement to provide transportation or parking. Infill development often occurs on land that is already impervious, so the development will not add imperviousness to the watershed. Instead, it will “reuse” existing imperviousness.

High density developments typically raise eyebrows (and hackles) among neighborhood groups and environmentalists. However, as described above, the only practical way to preserve open space and water quality watershed-wide will be to plan carefully to locate the majority of development in compact areas where infrastructure exists (or is planned for) to provide water, sewer, public transportation, and other services. Building up also helps reduce imperviousness. A four-story residence or parking structure consumes only a quarter the impervious surface as a one-floor residence or surface parking lot built to accommodate the same number

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of people or cars.

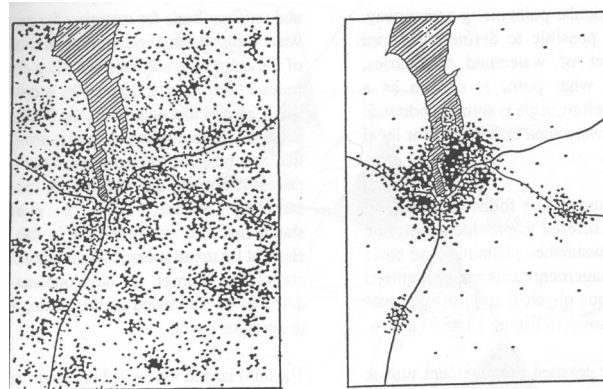
COMPACT DEVELOPMENT

Encouraging compact development particularly reduces the area dedicated to transportation, which comprises about 75% of imperviousness associated with new development. Research shows that each doubling of average neighborhood density is associated with a decrease in per-household vehicle use of 20-40% with a corresponding decline in emissions. European cities, where development is much denser than in most American cities, typically exhibit only one-fourth the per-person emissions of carbon dioxide and other pollutants from transportation that are typical of American cities due, in part, to compact developments. Residents in the U.S. spend about 20% of their annual income on transportation, whereas Europeans only spend 7%.

ATTRACTIVE HIGH DENSITY

OPTIONS NEEDED

Of course, it is not as simple as building denser, European-style cities, expecting developers to stop building in green fields, stopping the selling of land to developers, and convincing home buyers to stop buying suburban homes. But adding a high density mix of attractive housing, shopping, workplace, and transportation options is a necessary step in curbing the continued spread of low density suburban development that is consuming our remaining natural areas and poisoning our streams and lakes.



The left view shows dispersed low-density development spread throughout the region, while at right, an equal amount of development is concentrated in areas targeted for growth. Each dot represents a unit of development. At a regional level, the second type of growth produces less impervious cover and, therefore, less negative water quality impacts. Source: Center for Watershed Protection.

-Kris Olsson