



REDUCING GREENHOUSE GAS EMISSIONS: MUNICIPAL SOLUTIONS

FACT SHEET #1: SMART GROWTH



What is Climate Change?

Our global climate is always changing, but now the rate of change is accelerating much faster than ever before. The Earth's average temperature has increased by 1°F over the past 100 years. Although the change seems small, it has happened very quickly—a mere speck on the Earth's long lifetime. Rapid climate change can have major impacts on many aspects of the environment, such as water quality, agriculture, coastal erosion, and sea level.

Temperature changes naturally as a result of the Earth's CO₂ (carbon dioxide) cycle. Animals and other living things release CO₂ into the air, while other organisms, such as plankton, absorb CO₂ through the ocean. For millions of years, carbon dioxide and the other greenhouse gases (such as methane) were balanced by the Earth's delicate atmosphere. Since the Industrial Age, human activities, such as fossil fuel burning and de-forestation, have disturbed this balance. CO₂ emissions are now so high that they cannot be completely absorbed naturally. As a result, CO₂ is building up in the atmosphere and the Earth is warming (see Figure 1).

Evidence of climate change is all around us. Severe weather is becoming more common. Not only is the Earth's temperature rising, but the world's oceans are also rising. Signs of high sea levels and beach erosion become more obvious every year. These environmental impacts will become more serious as CO₂ continues to build up.

What We Can Do: Smart Growth

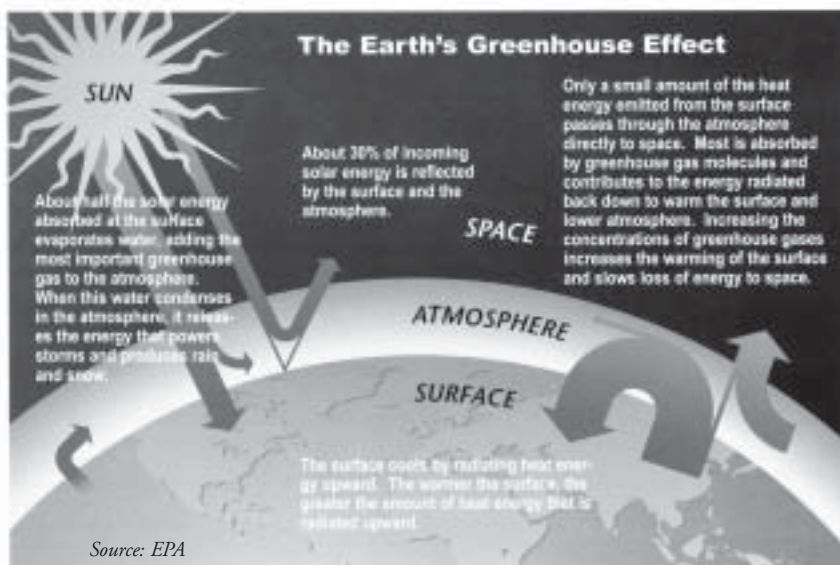
There are many ways to deal with the challenge of climate change. Some programs work to reduce carbon emissions, while others help communities adapt to environmental changes. The Waquoit Bay National Estuarine Research Reserve has identified several priority measures that communities can implement in order to lower the amount of carbon emissions they produce. This fact sheet focuses on smart growth, the use of planning and building techniques to minimize automobile trips and preserve important environmental features.

Example: Open Space Residential Design

Between 1971 and 1991, the population in eastern Massachusetts increased by 15%, while the area of developed land increased 35%. By 2020, the population is projected to increase by 8%, but development is expected to consume another 23% of the land.

The current rate and method of development causes damaging effects on communities, such as loss of open space, water pollution, and habitat destruction. While more people choose to move to coastal regions, such as Cape Cod, more open space is lost to development.

Open space residential design is an innovative method that minimizes the environmental hazards of land development. This design process, which works in the reverse order of traditional development methods, is executed in four steps:





Step 1. Identify areas for open space preservation.



Step 2. Site the houses to maximize views of the open space.



Step 3. Design roads to minimize their length, width, and cost.



Step 4. Draw the remaining lot line

Drawings courtesy of Randall Arendt

1. Identify areas for open space preservation based on environmental and social priorities.
2. Site the houses to maximize the number of lots with great views of the protected open space.
3. Design roads to minimize their length, width, and cost.
4. Draw the lot lines where they logically fall once the best locations for open space, houses, and roads are all identified.

This four-step design allows communities and developers to build around large areas so that land is protected, rural communities maintain local character, and property value is enhanced. A study in Amherst, Mass. showed homes in an open space development appreciated 12.7% faster over 20 years than homes in a conventional subdivision of the same overall density.

Many local bylaws and regulations are not set up for developers to pursue the open space residential design without high costs and lengthy reviews. Various conservation organizations, developers, realtors, builders, and local and state officials along the northern coast of Massachusetts have formed the North Shore Alliance for Green Neighborhoods. This alliance developed model bylaws, regulations, and incentive ideas for communities that would like to use the open space residential design. Contact Andrea Cooper (Andrea.Cooper@state.ma.us) of the Mass. Office of Coastal Zone Management for additional information.

With open space residential design, developers can build as many homes as in a traditional neighborhood on nearly half of the land. The remaining land is preserved as open space for communities to enjoy.

Sources:

Waquoit Bay National Estuarine Research Reserve, "Global Climate Change: What Communities Can Expect and What They Can Do", Science and Policy Bulletin Number 7, July 2001.

Massachusetts Office of Coastal Zone Management, "Greener Neighborhoods: Open Space Residential Design".

Natural Land Trust, "Growing Greener", November 1997.