

Life-Cycle Energy Assessment of Smart Growth Strategies

March 2011

Fact Sheet

The Issue

California's urban sprawl development has led to significant increases in automobile travel, increasing petroleum fuel demand, thereby decreasing environmental and human health quality. Sprawl requires significant public investments and energy consumption to build and sustain a vast infrastructure of paved roadways, parking lots, and fueling stations to support increased automobile travel. Conversely, smart growth strategies — such as infill development, transit-oriented development, and mixed-use development — could potentially reduce sprawl and its related consequences. The effectiveness of various smart growth strategies at reducing energy use, greenhouse gas emissions, and criteria pollutants remains largely unknown.

Project Description

This research will develop a life-cycle assessment methodology that will help stakeholders analyze and evaluate the energy and emission impacts of smart growth projects. This method will include a means to quantify the embedded energy in the infrastructure. Researchers will examine existing smart growth in two neighborhoods to determine:

- The energy and materials required to build, maintain, and operate the project over its expected lifetime.
- Transportation-related energy and emission reductions compared to a business-as-usual scenario.



This research will help stakeholders analyze and evaluate the energy and emission impacts of smart growth projects



Picture Credit: Energy Aware Planning Guide, Draft Consultant Report

- Institutional barriers and other challenges that stakeholders faced in implementing these projects.

Results from the two neighborhood analyses will be combined with previous research findings to create the life-cycle assessment methodology and additional decision-support tools.

PIER Program Objectives and Anticipated Benefits for California

Senate Bill 375 (Steinberg, 2008) provides a framework to meet regional transportation sector greenhouse gas reduction goals through local land use changes. This research will inform local land use decisions by providing:

- A methodology to quantify and compare the energy and emission benefits of smart growth projects.
- An analysis of local planning and policy options for reducing embedded energy in the transport system.
- An assessment of incentives and disincentives for implementing smart growth strategies.

Project Specifics

Contract Number: 500-10-009

Contractor: UCLA Institute of the Environment

City/County: Los Angeles, Los Angeles County

Assembly District: 47

Senate District: 23

Application: Nationwide

Contract Amount: \$550,000

Contract Term: September 2010 to August 2012

For more information, please contact:

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