

## Urban EcoMap

### An Innovative *Connected and Sustainable Cities* Pilot by the Cisco Internet Business Solutions Group (IBSG) and the City and County of San Francisco

#### Background

In recognition of the profound trends of urbanization, climate change, and innovation at the beginning of the 21<sup>st</sup> century, Connected Urban Development (CUD) was born from Cisco's commitment to the Clinton Global Initiative to participate in helping reduce carbon emissions in cities. Launched at the end of 2006, CUD consists of building partnerships with cities worldwide to focus on applying information and communications technology (ICT) to promote innovative practices for reducing carbon emissions, while fostering economic growth and improving the quality of life. Innovation is transforming urban life, and is making it possible to design and manage cities in radically different ways. With the advance of broadband, wireless, and increasingly smart city infrastructures, collaboration and connectivity are becoming essential to urban sustainability.

CUD envisions that the same principles of openness that have made the Internet a thriving ecosystem over the past 20 years can be applied to make cities a smarter platform for people, products, and services. This global, open-standards approach will support all urban and natural environment-related applications, tools, and technologies. It will provide real-time, tangible information to enable citizens, communities, cities, countries, and business organizations to make smarter decisions and to develop policies that improve the sustainability of cities. Following are the program's urban technology principles:

- Wired communications provide infrastructure
- Wireless communications provide mobility
- Miniaturized, inexpensive electronic devices provide access points everywhere
- Digital memory and processing power provide intelligence everywhere
- Software and online content provide new functionality and services

Through its partnership with San Francisco, CUD has created a global best practice—Urban EcoMap—that will provide new climate-change services to cities. It will be replicated across other CUD cities and scaled around the globe.

#### Overview

Urban EcoMap is a landmark innovation and a key element of CUD's Connected and Sustainable Cities framework. Begun in fall 2008, the pilot project is a collaborative effort involving Cisco IBSG—the global strategic consulting arm of Cisco—and San Francisco's Department of the Environment (SF Environment). The organizations are jointly applying an Urban Services Platform approach toward which visionary cities and the ICT industry are moving. San Francisco will be the first city worldwide to launch Urban EcoMap, with the

introduction planned for Earth Day 2009 (April 22). Because cities produce 80 percent of greenhouse gas (GHG) emissions worldwide, and are the major contributor to their nations' economies, they present the largest opportunity for innovation and social behavior changes. As we move from educating people about climate change to taking action to mitigate climate impacts, we need technology, process, and culture to help spur a shift to climate-friendly social behavior in cities. Urban EcoMap helps address this objective.

Urban EcoMap provides urban communities with relevant data regarding the primary GHG contributors—transportation, waste, and energy. Building awareness, fostering a sense of community connection and responsibility, and providing actions for citizens to take will enable the reduction of GHG in cities. In addition, it will support decision-making for policymakers and business organizations, as well as for urban design, development and operations, and the research of urban, earth, and social scientists.

**Figure 1.** Urban EcoMap San Francisco Homepage.



## Powered by an Urban Services Platform

CUD ultimately envisions Urban EcoMap as part of a global Urban Services Platform for—and among—cities. Services will include, but are not limited to, citizen engagement, collaboration, community-building, professional geo-referential data, real-time environmental and energy metering and monitoring, simulations for real estate development, transportation planning, location marketing, and city games.

The Urban Services Platform is based on an *EcoSystem approach*. EcoSystem encompasses an eco-centric set of technologies and standards that allow for interoperability of “eco applications” and devices. Much like the Internet, it is a multi-layer stack of standards that defines how applications and devices consume and share information. Applications publish (contribute) eco-data to EcoSystem, and other applications can then discover and consume it. This allows for a single, global system and, more important, a global “pulse” of the eco-health of our planet.

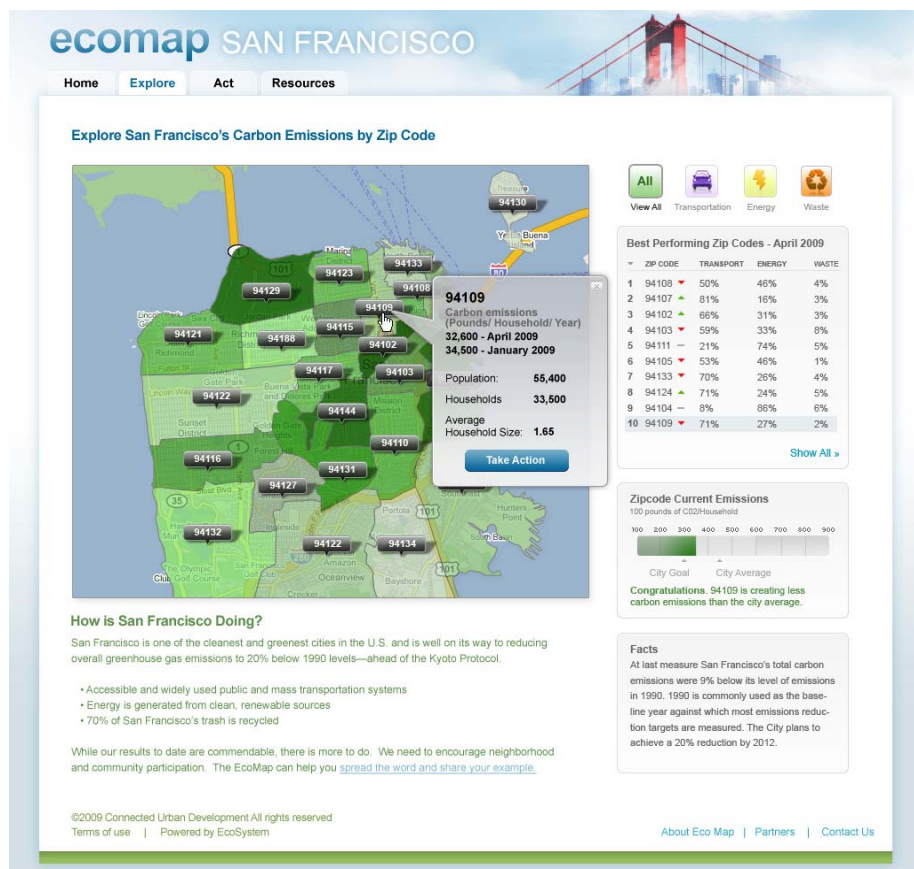
To tackle global climate change, we need a global view, which requires a global, open-standards approach. While many emerging solutions (applications and devices) provide great utility from an eco perspective, they are typically “siloe,” proprietary, and closed. They simply do not share valuable information with each other.

## Key Features

The Urban EcoMap San Francisco pilot launch provides dynamic information to inhabitants of cities on both the community’s progress toward meeting GHG-reduction goals and on the most useful, locally available tools and resources for reducing their carbon footprint. Urban EcoMap consists of two key features:

- Discover Your City’s Neighborhoods:** Urban EcoMap shows GHG emissions data, in addition to displaying a set of transportation, energy, and waste indicators to assist residents in visualizing both the specific actions they can take to fight climate change, and the impact of those actions. Factors include alternative-fuel vehicle ownership, recycling, and energy use / efficiency per household. All this information will be aggregated on a neighborhood level, organized by the city’s zip codes, allowing users to highlight data that can be directly compared by zip code as well as among cities.

**Figure 2.** Urban EcoMap Allows San Franciscans to View GHG Emissions by Zip Code.



- Take Climate Actions:** Citizens have the ability to select climate-related actions to help decrease the carbon footprint of their zip code and their city. Citizens can view and select actions based on the level of effort required to make the change, the associated cost or financial benefit, and the environmental impact of the action. Based

on their selections, citizens can take appropriate climate actions for transportation, energy, and waste, and then share them with others. Additionally, resources are provided so that users can obtain immediate access to the most useful, locally available tools and incentives to enable change.

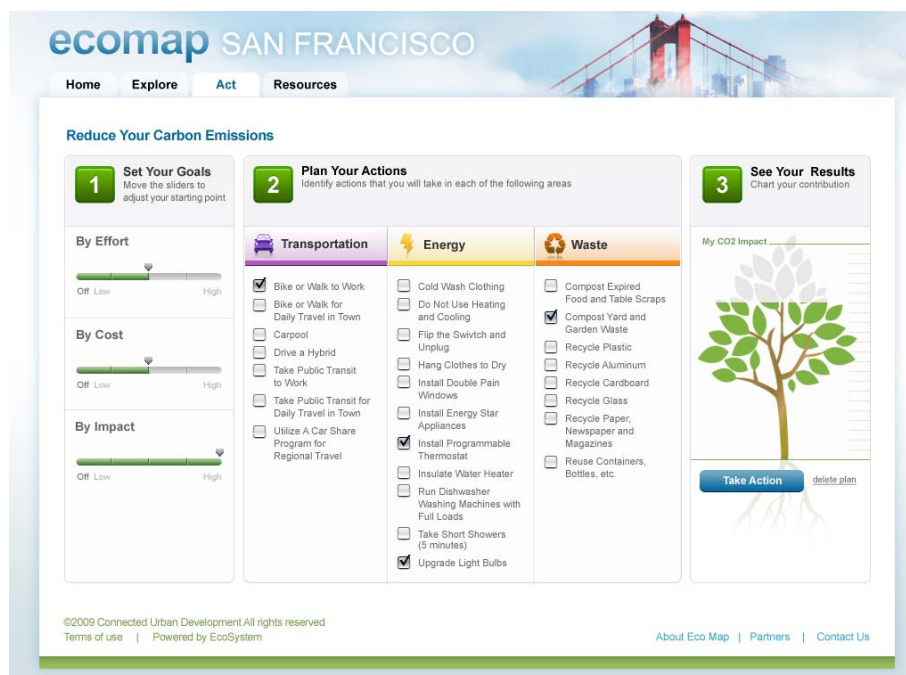
In the future, the Urban EcoMap San Francisco pilot will address mobile applications, user-generated content, and access to real-time information pertaining to personal energy usage, transportation, and consumption behavior.

## Citizen Benefits

Urban EcoMap's goal is to help spur a shift to climate-friendly behavior in cities. Citizens want to see the collective results of their individual climate-change actions. Urban EcoMap allows citizens to see the impact of their climate-change activities, while also motivating people and creating competition among neighborhoods:

- Brings the issue of climate change home by providing information about carbon sources and environmental solutions on a local level
- Conveys the message that “solutions are closer than you think” by offering easy access to resources that suggest effective options
- Provides a decision-making platform for individuals to set explicit goals according to personal effort, cost savings, and environmental impact
- Creates confidence that, by taking these small steps, individuals are contributing to the big solution by providing feedback on cumulative benefits / results
- Provides the ability to inspire others to take action
- Allows citizens to compare their cities' climate-change actions with those of other cities

**Figure 3.** Urban EcoMap Estimates the Effort, Cost, and Impact of Various Climate Actions.



## Policymaker Benefits

Urban EcoMap is fostering transparency and better communication and services to—and among—citizens regarding environmental issues:

- Provides citizens with access to concrete climate actions in their communities
- Improves decision-making support for energy efficiency and carbon emission reductions
- Tracks the effectiveness of climate-action programs
- Shares experiences among other cities
- Enables cities around the world to calculate the carbon footprint of their communities in a uniform way
- Provides third-party verified data that is compatible with internationally accepted sustainability protocols

## Innovation Partner Benefits

EcoSystem removes barriers to contributing and consuming eco-data. Much as anyone can create a website and contribute to the web thanks to open standards, anyone can develop solutions that contribute to EcoSystem. The open standards will be defined by a consortium of individuals and companies that wish to contribute. There is no single “EcoSystem”—it is an ever-changing, almost organic set of solutions that communicates in a common language to achieve a common goal.

## Partners

Urban EcoMap San Francisco is a collaborative effort among the following partners:

- City and County of San Francisco
- Cisco
- Arup
- CH2M HILL
- NASA
- Swiss Federal Institute of Technology Zurich