Defining a BIM-Enabled “Smart City”

Emma Stewart, Ph.D.
Head of Sustainability Solutions, Autodesk
Sensors, Big Data, and Everything Internet?
Confusing the Means with the End

Photo credit: Pixar; SPUR's Design for Walkability website
“The role of technology is central to the task of making sure that infrastructure investment has something to do with the kind of society, and the kind of capabilities, we need to provision in order to combine the growth, sustainability, inclusion and innovation that the “‘world of the future” demands.”

– Dr. Ken Henry, frmr Sec. Dept. of Treasury, Australia
Sets science-based targets

Makes the comprehensive business case

Absorbs water

Retrofits energy hogs

Transports people, not cars
In the 1980s, 500 people lived in downtown Manchester. Now 20,000 do and our population growth rivals that of London.

We used select design principles to avoid inadvertently rebuilding slums and a bold greenhouse gas reduction target to help revitalize the urban core.

-- Mayor Leese, City of Manchester, 2013
Sets science-based targets

1. Basic City Data
2. GDP Growth
3. City Carbon Footprint
4. Results

Source: City of Palo Alto takes on Greenhouse Gas Emissions with a little help from Autodesk "C-FACT" Tool, October 2014
“NYC Capital Planning now requires a triple bottom line analysis, and we need tools to do it.”

-- Danny Fuchs, Director of Capital Planning, NYC, 2015

“We will not invest in any infrastructure project that does not include long-term triple-bottom-line analysis from early planning into operations.”

-- Mark Weisdorf, CEO & Managing Director, Infrastructure Investments, JP Morgan Asset Management, 2014
Makes the comprehensive business case

Value Sustainability, Account for Risk

See Breakdown of Costs and Benefits

See Benefits by Stakeholder

Compare Designs or Projects
Absorbs water
Absorbs water

Input local code

Library of green stormwater design techniques

Design until runoff volume is 0.00”

Auto-benchmark against LEED and Envision
The City of Atlanta has committed to reduce building energy use by 20% by 2020, but we only want to focus on the buildings where worthwhile improvements can be made.

-- Mayor Kasim Reed, City of Atlanta, 2013
Retrofits energy hogs

Satellite Imagery

Photos

Basic Building Data

Build Conceptual Model with simple tools

Video

Identify Systems Upgrades

Save Energy with Operational Improvements
The car is the cigarette of the future.

-- Jaime Lerner, Former Mayor of Curitiba, Former Governor of Parana, and current President of International Union of Architects, 2014

Transports people, not cars
Transports people, not cars
<table>
<thead>
<tr>
<th>S</th>
<th>Sets science-based targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Makes the comprehensive business case</td>
</tr>
<tr>
<td>A</td>
<td>Absorbs water</td>
</tr>
<tr>
<td>R</td>
<td>Retrofits energy hogs</td>
</tr>
<tr>
<td>T</td>
<td>Transports people, not cars</td>
</tr>
</tbody>
</table>