Housing Design Today as a Key Solution To Health Epidemics and Disparities

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NYC Department of Health & Mental Hygiene
THE 19th CENTURY:

Infectious disease

19th Century codes, planning and infrastructure as weapons in the battle against contagious disease

These strategies were built into the city fabric, and they were effective

THE 21st CENTURY:

Chronic Diseases, many of which are “Diseases of Energy”

The emerging design solutions for health parallel sustainable design solutions

Effective designs will have to be an invisible, pervasive, and inevitable part of life
The epidemics of today are:

**CHRONIC DISEASES**
(obesity, diabetes, heart disease & strokes, cancers)

Top 5 Causes of Death in U.S.:


Energy in: Food

Energy out: Exercise
Obesity Trends* Among U.S. Adults

BRFSS, 1985

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4″ woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 1986

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults
BRFSS, 1987

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults
BRFSS, 1988
(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 1989

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 1990

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 1991

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 1992

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 1993

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults
BRFSS, 1994
(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults
BRFSS, 1995

(*BMI ≥30, or ~30 lbs overweight for 5’4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 1996

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 1997

(*BMI ≥30, or ~30 lbs overweight for 5′ 4″ woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults
BRFSS, 1998

(*BMI ≥30, or ~ 30 lbs overweight for 5′ 4″ woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 1999

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 2000

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 2001

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 2002

(*BMI ≥30, or ~30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 2003

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 2004

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 2005

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults
BRFSS, 2006
(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults
BRFSS, 2007
(*BMI ≥30, or ~30 lbs overweight for 5′ 4″ woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 2008

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Obesity Trends* Among U.S. Adults

BRFSS, 2009

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)

Source: U.S. Centers for Disease Control and Prevention (CDC)
Diabetes trends among U.S. adults

According to the CDC......

the medical costs attributable to obesity today in the U.S. are estimated to be

$147 billion per year.

By 2030, if obesity trends continue as shown, the total attributable health-care costs will be

$860-$956 billion per year. (6.5x...)
NYC is now faced with a population where about 60% of adults and 40% of children are overweight or obese.
Disparities in Obesity and Diabetes Rates, by New York City Neighborhood

Neighborhoods with more obesity have more diabetes

Diabetes in NYC's Neighborhoods

- Washington Heights-Inwood: 2-5%
- South Bronx: 6-11%
- Pelham-Throgs Neck: 12-15%
- East Harlem: 6-11%
- Williamsburg-Bushwick: 2-5%
- Bedford Stuyvesant-Crown Heights: 2-5%
- East New York: 6-11%

Obesity in NYC's Neighborhoods

- Central Harlem-Morningside Heights: 16-23%
- South Bronx: 24-32%
- East Harlem: 16-23%
- Williamsburg-Bushwick: 7-15%
- Bedford Stuyvesant-Crown Heights: 7-15%
- East Flatbush-Flatbush-Camarsie-Flatlands: 7-15%
DISPARITIES IN HEALTHY FOOD ACCESS

Understanding where people have **limited** access to fresh produce + where the **highest** rates of diabetes and obesity are
DISPARITIES IN PHYSICAL ACTIVITY

Percent of adults meeting goal for moderate or vigorous physical activity

<table>
<thead>
<tr>
<th>Neighborhood Income</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>34</td>
<td>35</td>
<td>42</td>
</tr>
</tbody>
</table>

NYC DOHMH, Community Health Survey, 2005
Our Built Environments Play a Critical Role!
### Evidence-based Research: Increasing Physical Activity through Building, Street, and Neighborhood Design

#### Designing to increase stair use

**Point-of-Decision stair prompts**
- Signs placed at elevators & escalators encouraging stair use, w/ info on benefits of stair use
- Median **50% increase** in stair use

#### Design and aesthetic interventions
- Music & art in stairwells

#### Design stairs to be more convenient and visible

**Skip-stop elevators**
- **3300% increase** in stair use

#### Designing to increase active recreation

**Enhancing access to places for physical activity**, such as creating walking trails or having onsite or nearby parks, playgrounds and exercise facilities (homes & worksites)

#### Designing to increase active transportation

**Walking, Bicycling and Transit-oriented development**
- Designs to improve street safety and aesthetics (less crime and traffic / more greening), having sidewalks and bike paths connected to destinations, mixed land use, high population density
- Median **increase in physical activity 35% to 161%**
### Co-benefits: Improve the Environment

<table>
<thead>
<tr>
<th></th>
<th>Fuel / Electricity Use</th>
<th>Air Quality</th>
<th>Obesity/Diabetes/Heart Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biking or walking rather than automotive transport</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Stairs rather than elevators and escalators</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Active recreation rather than television</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Safe tap water rather than bottled and canned beverages</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Fresh produce rather than unhealthy processed foods</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Co-benefits: Lower Costs to Communities

More compact, walkable development patterns save money on avoided infrastructure costs

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Water &amp; Sewer Laterals Required</th>
<th>Water &amp; Sewer Costs (billions)</th>
<th>Road Lane Miles Required</th>
<th>Road Land Miles Costs (billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sprawl Growth Scenario</td>
<td>45,866,594</td>
<td>$189.8</td>
<td>2,044,179</td>
<td>$927.0</td>
</tr>
<tr>
<td>Compact Growth Scenario</td>
<td>41,245,294</td>
<td>$177.2</td>
<td>1,855,874</td>
<td>$817.3</td>
</tr>
<tr>
<td>Savings</td>
<td>4,621,303</td>
<td>$12.6 (10.1%)</td>
<td>188,305</td>
<td>$109.7 (6.6%)</td>
</tr>
</tbody>
</table>

Sprawl Costs: Economic Impacts of Unchecked Development, Robert W. Burchell, Anthony Downs, Barbara McCann and Sahan Mukherji, Island Press, 2005
People in walkable, transit-rich neighborhoods spend only 9 percent of their monthly income on transportation costs; those in auto-dependent neighborhoods spend 25 percent.

Source: Center for Transit-Oriented Development
### Co-benefits: Job Creation

Building bicycle and pedestrian infrastructure creates more jobs per dollar invested, compared to road infrastructure only.

<table>
<thead>
<tr>
<th>Project type</th>
<th>Road</th>
<th>Bicycle</th>
<th>Pedestrian</th>
<th>Off-street trail</th>
<th>Number of projects</th>
<th>Direct jobs per $1 million</th>
<th>Indirect jobs per $1 million</th>
<th>Induced jobs per $1 million</th>
<th>Total jobs per $1 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total all projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>58</td>
<td>4.69</td>
<td>2.12</td>
<td>2.15</td>
<td>8.96</td>
</tr>
<tr>
<td>Bicycle infrastructure only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>6.00</td>
<td>2.40</td>
<td>3.01</td>
<td>11.41</td>
</tr>
<tr>
<td>Off-street multi-use trails</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
<td>5.09</td>
<td>2.21</td>
<td>2.27</td>
<td>9.57</td>
</tr>
<tr>
<td>On-street bicycle and pedestrian facilities (without road construction)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>4.20</td>
<td>2.20</td>
<td>2.02</td>
<td>8.42</td>
</tr>
<tr>
<td>Pedestrian infrastructure only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td>5.18</td>
<td>2.33</td>
<td>2.40</td>
<td>9.91</td>
</tr>
<tr>
<td>Road infrastructure with bicycle and pedestrian facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13</td>
<td>4.32</td>
<td>2.21</td>
<td>2.00</td>
<td>8.53</td>
</tr>
<tr>
<td>Road infrastructure with pedestrian facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
<td>4.58</td>
<td>1.82</td>
<td>2.01</td>
<td>8.42</td>
</tr>
<tr>
<td>Road infrastructure only (no bike or pedestrian components)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11</td>
<td>4.06</td>
<td>1.86</td>
<td>1.83</td>
<td>7.75</td>
</tr>
</tbody>
</table>

Source: Political Economy Research Institute: June 2011
Co-benefits: Creating More Accessible Places

- Creating safer places to walk, take transit, & for wheelchair travel
- Making elevators more available for those who need them
Integrating Health into Urban & Building Design Policies & Practices

• The Need for **Partnerships Across Sectors**

• Finding Synergies and Co-Benefits

• **Complementary Roles** of Partners
  – **Health**: Data on key health issues; evidence for interventions; helped organize meetings/conferences for cross-sector discussions; co-leader/partner in initiatives; health-related evaluations
  – **Transportation, City Planning, Design + Construction, Buildings, Housing, Parks, School Construction, Private Sector Architects/Developers**: Ideas of what’s feasible in the current local context; identifying opportunities and mechanisms, including and especially synergistic efforts; co-Leadership and participation in the efforts
  – **Researchers**: evidence reviews and synthesis, evaluation research

• Using **Evidence-Based and Best-Practice Strategies**

• Using **Annual Conferences as Strategic Milestones**
  – E.g. Annual NYC Fit City Conferences – Fit City 8 June 24/25, 2013
Fit City Conferences

Fit-City:
Promoting Physical Activity Through Design

Fit-City 3:
Promoting Physical Activity Through Design
NYC Active Design Guidelines

Chapters

1) Environmental Design and Health: Past and Present
2) Urban Design: Creating an Active City
3) Building Design: Creating Opportunities for Daily Physical Activity
4) Synergies with Sustainable and Universal Design

www.nyc.gov/adg
Creation of the Guidelines

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Ch. 4 – Synergies with Green: E.g. LEED Green Building Credits that Promote PA

- Development density and community connectivity
- Public transportation access
- Bicycle storage and changing rooms
- LEED Physical Activity Innovation/Pilot Credit
Active outdoor spaces including community roof gardens

18-story tower harvests rainwater for growing food

Includes prominent stairs and fitness center; walking distance to school

Via Verde, South Bronx
Creation of Additional Resources:
Active Design Supplement Documents

Active Design: Promoting Safety
http://centerforactivedesign.org/promotingsafety
+
Active Design: Affordable Designs in Affordable Housing
http://centerforactivedesign.org/affordablehousingcosts