



Risk Factors Contributing to Obesity and Chronic Disease

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“A lack of exercise is now causing as many deaths as smoking across the world”



Source: **The pandemic of physical inactivity: global action for public health.** Prof Dr Harold W Kohl PhD a, Cora Lynn Craig MSc b, Prof Estelle Victoria Lambert PhD c, Prof Shigeru Inoue MD d, Jasem Ramadan Alkandari PhD e, Grit Leetongin MD f, Sonja Kahlmeier PhD g, for the Lancet Physical Activity Series Working Group

Design and Physical Activity

People haven't changed – but our environment has



We are Designing the Problem



<http://chriswiewiora.com/wp-content/uploads/2012/05/suburbia.jpg>



The Need for Change

The last time we really changed the way we designed our cities was in response to the automobile, over HALF A CENTURY ago!

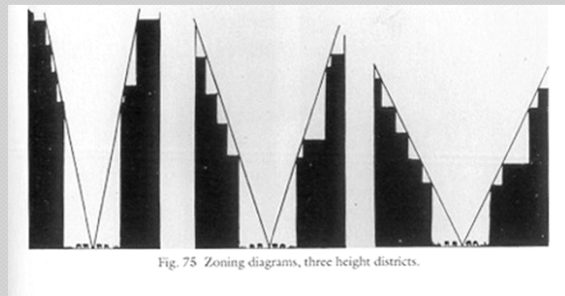
If a business did not update its practices and processes in over 50 years it would be out of business today!!!



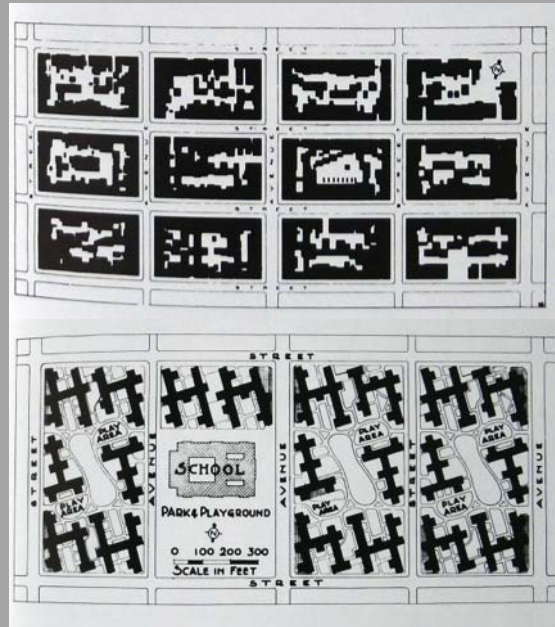
Proposal for Manhattan Expressway

Modern Day Relevance

Our built environment changes and evolves, and with it, so must our thinking, our regulations, and our policies!



1916 Zoning Resolution NYC
(light and air; separated uses)



1938 Williamsburg Houses

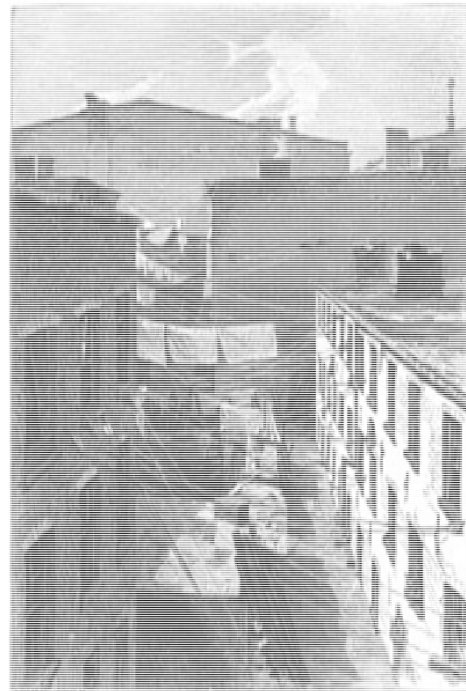
A new model of urban thinking
(automobile; tower in the park)



**Today: A chance to redefine
our future**

History of Health and the Built Environment

100+ years ago, urban conditions in NYC (and many other cities) created a breeding ground for disease epidemics



A PERSEPOLIS PUBLICATION
(Reprinted from a Photograph by Anthony.)

OVERCROWDING

By 1910, the average density in lower Manhattan was 114,000 people/ sq. mi;
Two wards reached densities > 400,000.
(Today's density: 67,000/ sq. mi.)



INADEQUATE SYSTEMS

for garbage, water, and sewer, leading to pervasive filth and polluted water supplies.

MAJOR EPIDEMICS

Air/droplet-borne diseases:

TB

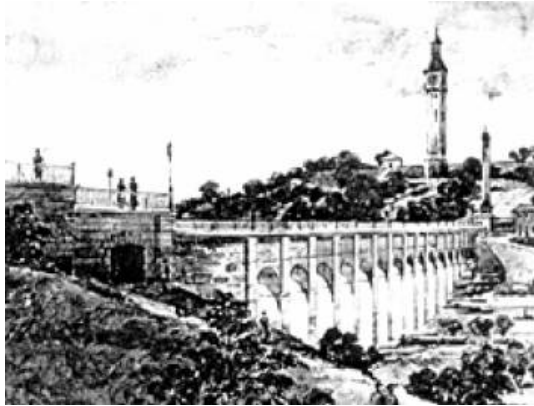
Water-borne diseases:

Cholera

Vector-borne diseases:

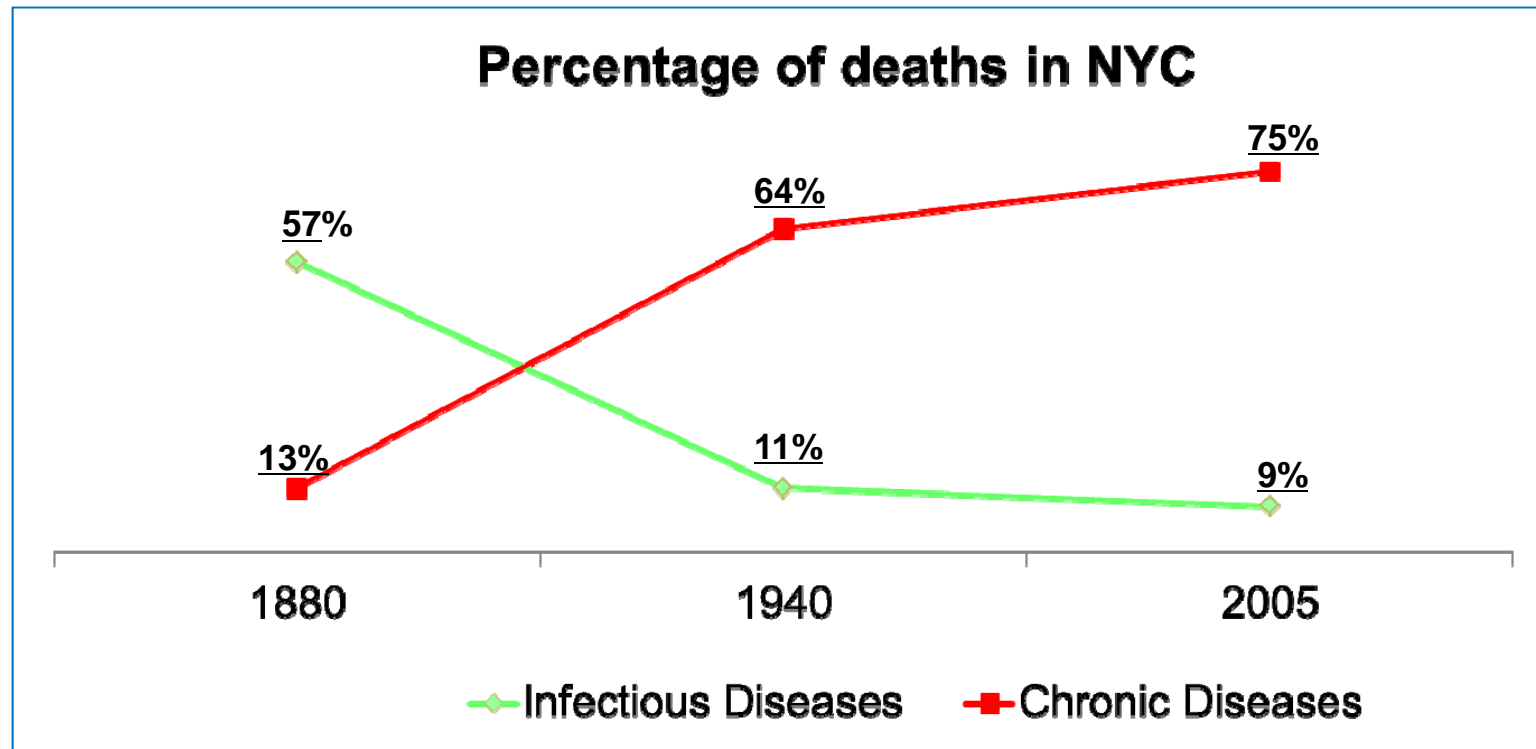
Yellow-fever

The Design Response



- 1842 ● New York's **water system** established – an aqueduct brings fresh water from Westchester
- 1857 ● NYC creates **Central Park**, hailed as “ventilation for the working man’s lungs”, continuing construction through the height of the Civil War
- 1881 ● Dept. of Street-sweeping created, which eventually becomes the **Department of Sanitation**
- 1901 ● **New York State Tenement House Act** banned the construction of dark, airless tenement buildings
- 1904 ● First section of **Subway** opens, allowing population to expand into Northern Manhattan and the Bronx
- 1916 ● **Zoning Ordinance** requires stepped building setbacks to allow light and air into the streets

The Results: Infectious disease rates plummeted



- Today, **chronic disease** accounts for 75% of deaths.
- In 2005, 133 million Americans – **almost 1 out of every 2 adults** – had at least one chronic illness.

Can design help today's health epidemics?

THE 19th CENTURY:

infectious diseases

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

Today's Epidemic – Chronic Disease

Chronic diseases are the leading causes of death and disability in the U.S.

Four Common Causes of Chronic Disease

Four modifiable health risk behaviors are responsible for much of the illness, suffering, and early death related to chronic diseases:

- lack of physical activity
- poor nutrition
- tobacco use
- excessive alcohol consumption

More than 1/3 of all adults do not meet recommendations for aerobic physical activity based on the 2008 *Physical Activity Guidelines for Americans*, and 23% report no leisure-time physical activity at all in the preceding month.

Risk Factors Contributing to Obesity and Chronic Disease

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Solutions



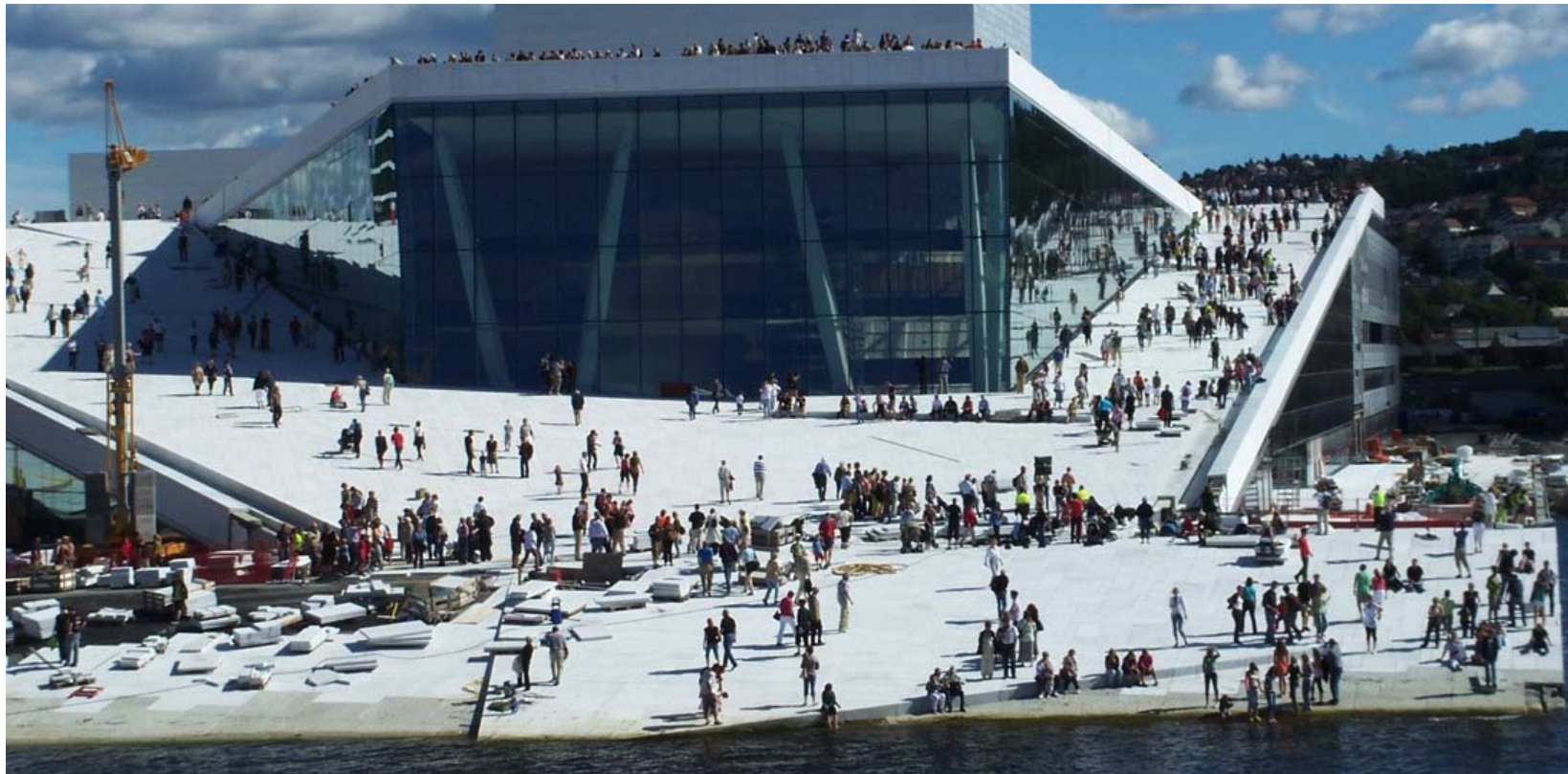
Bike share, waterfront, skyscrapers, streets, open spaces, stations...

We should borrow and share from place to place, learning what didn't work, making it better, and most importantly adapt and morph these ideas into what makes sense for **YOUR** built environment!

Solutions

Be visionary and set clear goals that you can all align to and work together collaboratively to achieve!

Who are the different stakeholders and what do they have at stake?



Solutions

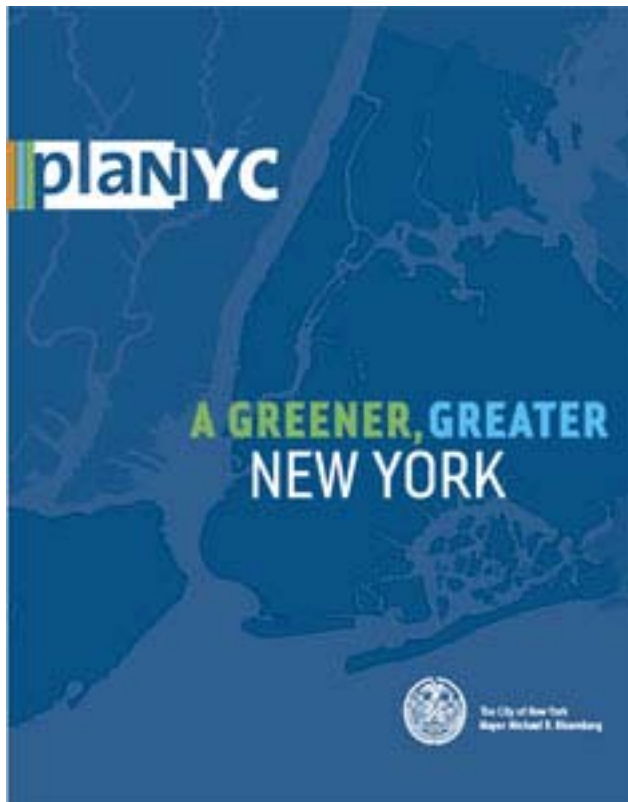
Look at the tools and mechanisms you have at hand to help shape the change you are striving for



Case Study: New York City Long Term Planning Goals

2007: Office of Long Term Planning and Sustainability

- Set long term vision + coordinate + oversee efforts across agencies
- 1 million new people by the year 2030

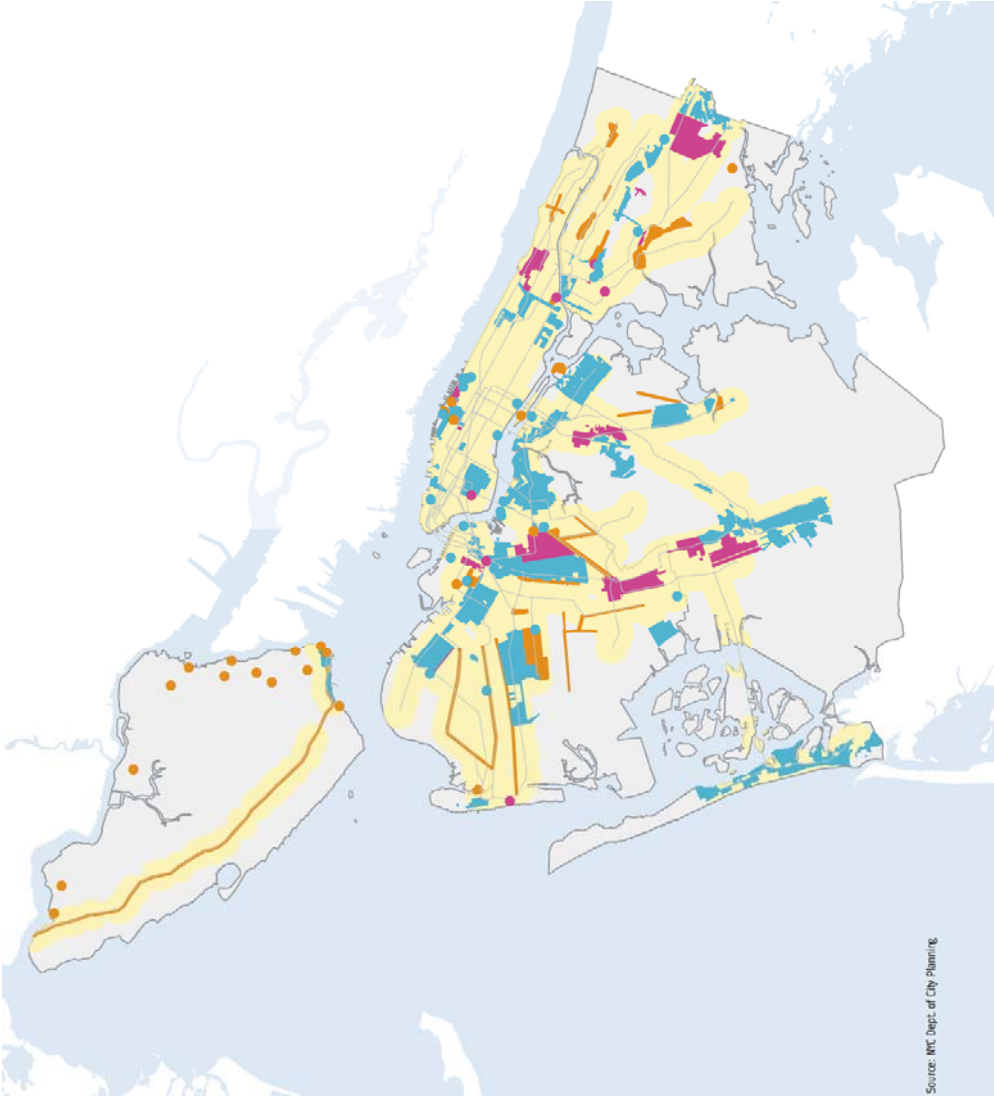


Case Study: New York City Smart Growth

Focus the development for nearby
public transit access

Recent, Planned, and Potential Initiatives
to Increase Capacity for Residential Growth

- APPROVED INITIATIVES
- PENDING & PLANNED INITIATIVES
- AREAS OF OPPORTUNITY
- AREAS WITHIN 1/2 MILE OF SUBWAY STATION



Case Study: New York City Complete Neighborhoods



HOUSING FOR ALL



JOBS



LOCAL RETAIL



OPEN SPACE

Policy Mechanisms

We have been encouraging people to change their behavior through building healthier environments and by changing policy

Incentivize certain practices



Protect



Mandate + relieve the burden



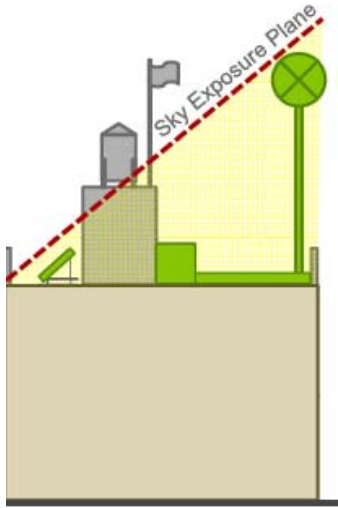
Allow



Create minimum design standards



Remove impediments



E ELEVATION (not to scal

Policy

Land Use Mix – Walkable Neighborhoods

According to an ALR study, residents of communities with a mix of shops and businesses within easy walking distance have a **35 percent lower risk of obesity** than residents of communities that do not have these services within easy walking distance

Designing for Active Transportation, San Diego: Active Living Research, February 2005

Gap in research around the components of a neighborhood that supports Active Living



Active Design

Using Evidence Based and Best Practice design strategies



Origins and development of the *Active Design Guidelines*



- Annual **Fit City** conferences since 2006
Expanded to Fit Nation and Fit Cities, Fit World
- **Building Partnerships** included City Agencies, Health and Design professional, Real Estate Developers
- The **Centers for Disease Control and Prevention** funded initial outreach efforts
- The **Center for Active Design** is now leading efforts to disseminate information about active design



**FIT CITIES
FIT WORLD 2013**

AN INTERNATIONAL CONFERENCE HOSTED IN LONDON
18 and 19 March 2013

Center for Active Design

Promoting Health through Design

MISSION

Organized in response to a growing international health crisis, the Center for Active Design seeks to reduce obesity and chronic diseases by promoting physical activity and healthy eating through the design of buildings, streets, and neighborhoods.



Active Transportation

Active Recreation

Food Access

Active Buildings

Key Concepts

Active Transportation



Active Recreation



Active Buildings



Healthy Food Access



ACTIVE TRANSPORTATION

Each hour spent in a car contributes a 6% risk in obesity and chronic disease while each km walked contributes a 5% decrease in risk



ACTIVE TRANSPORTATION // ACTIVE BUILDINGS

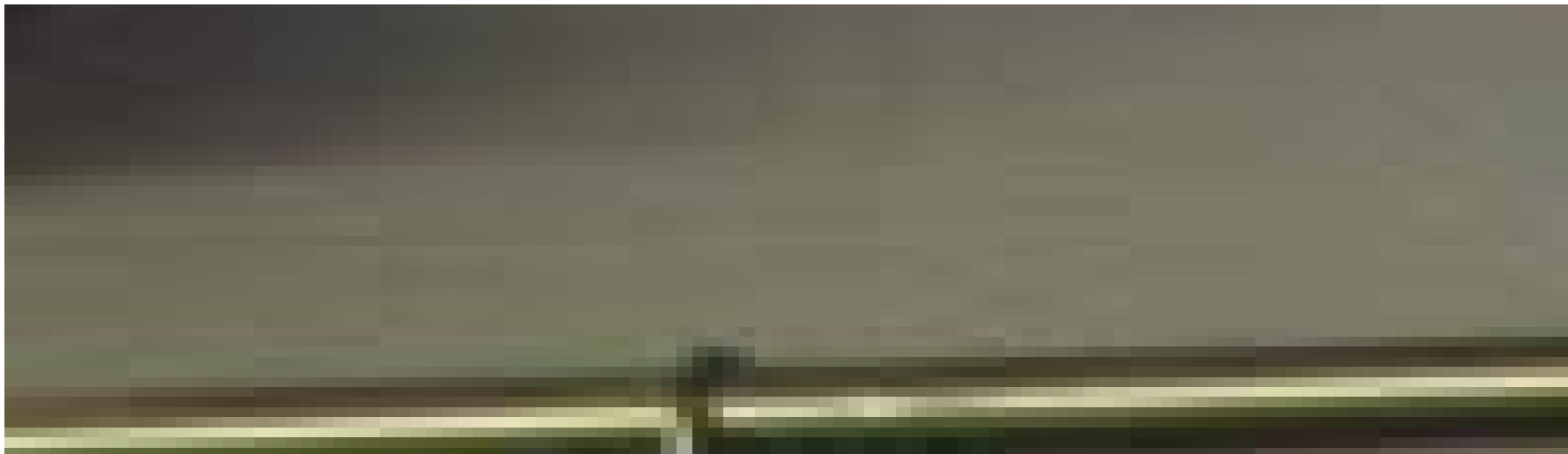
Bicycle Parking and Storage



Just 15 minutes of cycling (2.5 miles) twice a day burns the equivalent of 10 lbs per year

Source: MyPyramid.gov:
[How many calories does physical activity use?](#)

Secure bike storage with easy access



ACTIVE TRANSPORTATION // URBAN DESIGN STRATEGY

Bicycle Network and Infrastructure

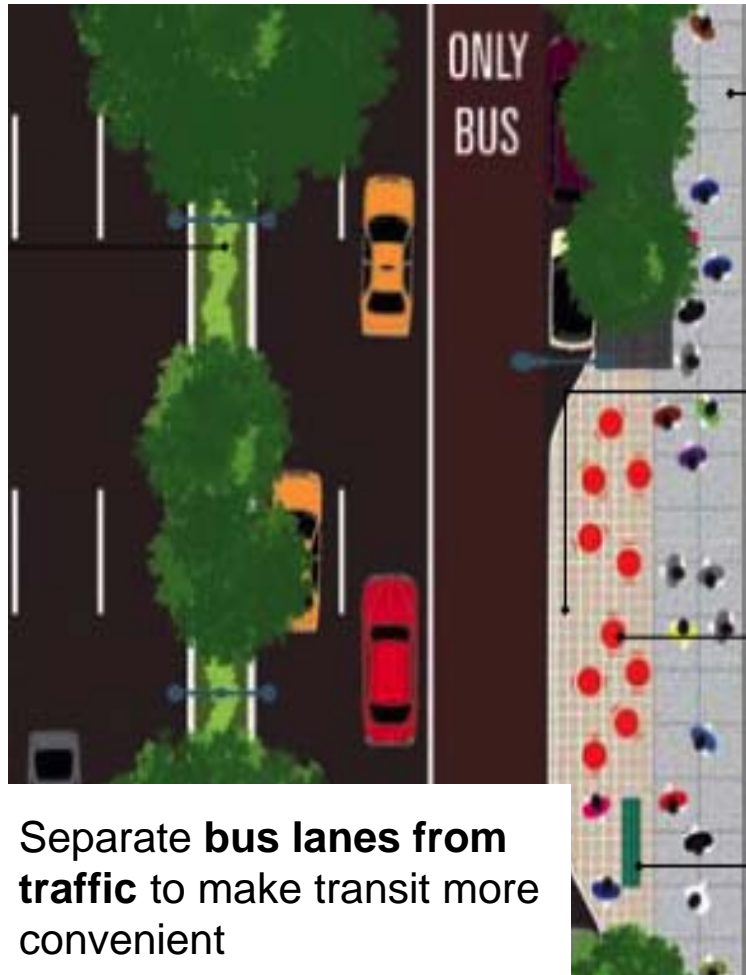


Provide attractive **signage, wayfinding, and secure bike parking**



ACTIVE TRANSPORTATION // URBAN DESIGN STRATEGY

Transit



Separate **bus lanes** from **traffic** to make transit more convenient



Provide **attractive** and **sheltered seating areas** to encourage use of transit routes

URBAN DESIGN STRATEGY

Pedestrian Environment



Reduce crossing distances
with
median refuge islands

URBAN DESIGN STRATEGY

Pedestrian Environment

Research in the Netherlands and Japan indicated that people were more likely to walk or cycle to work if the streets were lined with trees and live longer and feel better as a result.

Van den Berg, A.E., Koole S.L., and Van der Wulp N.Y. (2003). 'Environmental preferences and restoration: (how) are they related?' *Journal of Environmental Psychology* 23, 135-146.



URBAN DESIGN STRATEGY

Complete Streets results in NYC between 2000 and 2012



- 30% reduction in traffic fatalities**
- 10% growth in bus and subway ridership**
- 262% increase in commuter cycling**
- 5% reduction in motor vehicle registrations**
- 25% decline in citywide traffic volumes**



HEALTHY FOOD ACCESS

Farmers Markets



ACTIVE BUILDINGS

Limited access to nutritious food and relatively easier access to less nutritious food may be linked to poor diets and, ultimately, to obesity and diet-related diseases.

Access to Affordable and Nutritious Food:
Measuring and Understanding Food Deserts and Their Consequences USDA 2006



ACTIVE RECREATION // HEALTHY FOOD ACCESS

Street Trees and Planting



HEALTHY FOOD ACCESS

Supermarket Incentive Program

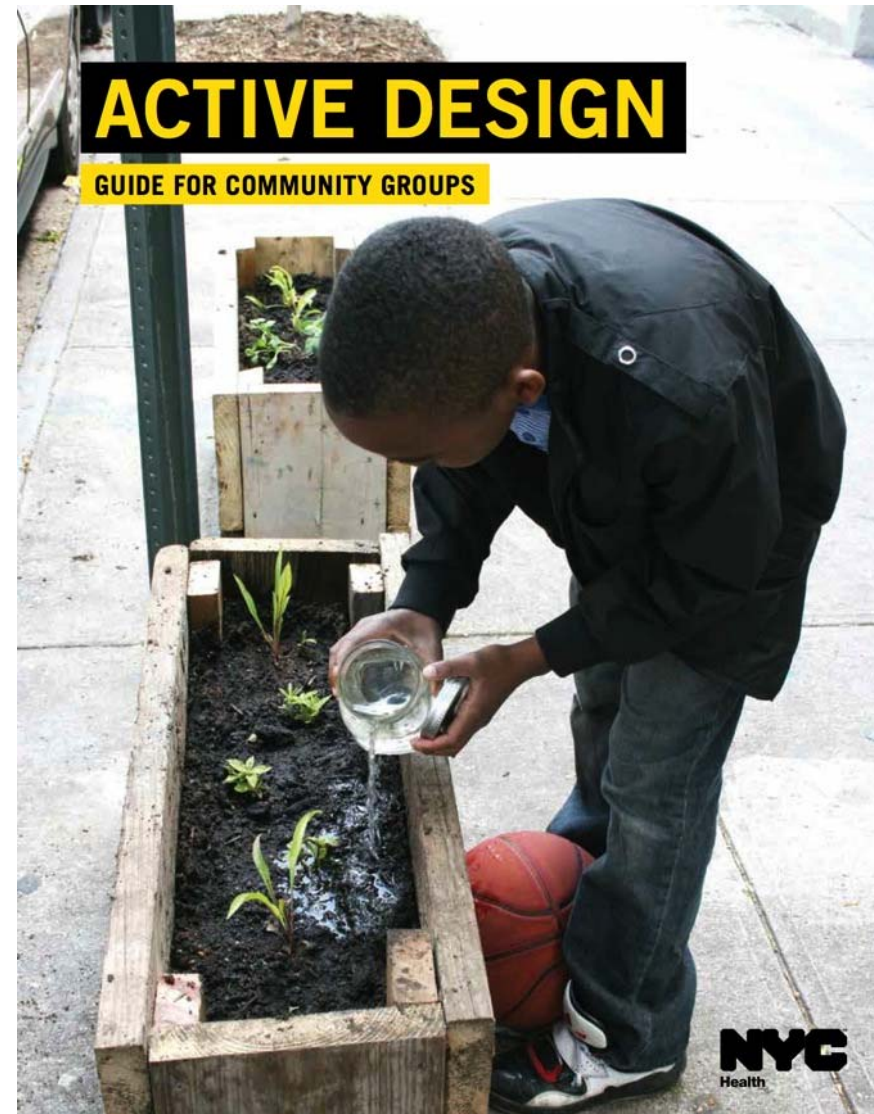
Remove planning impediments for neighborhood supermarkets



ACTIVE RECREATION

Community Scale Strategies

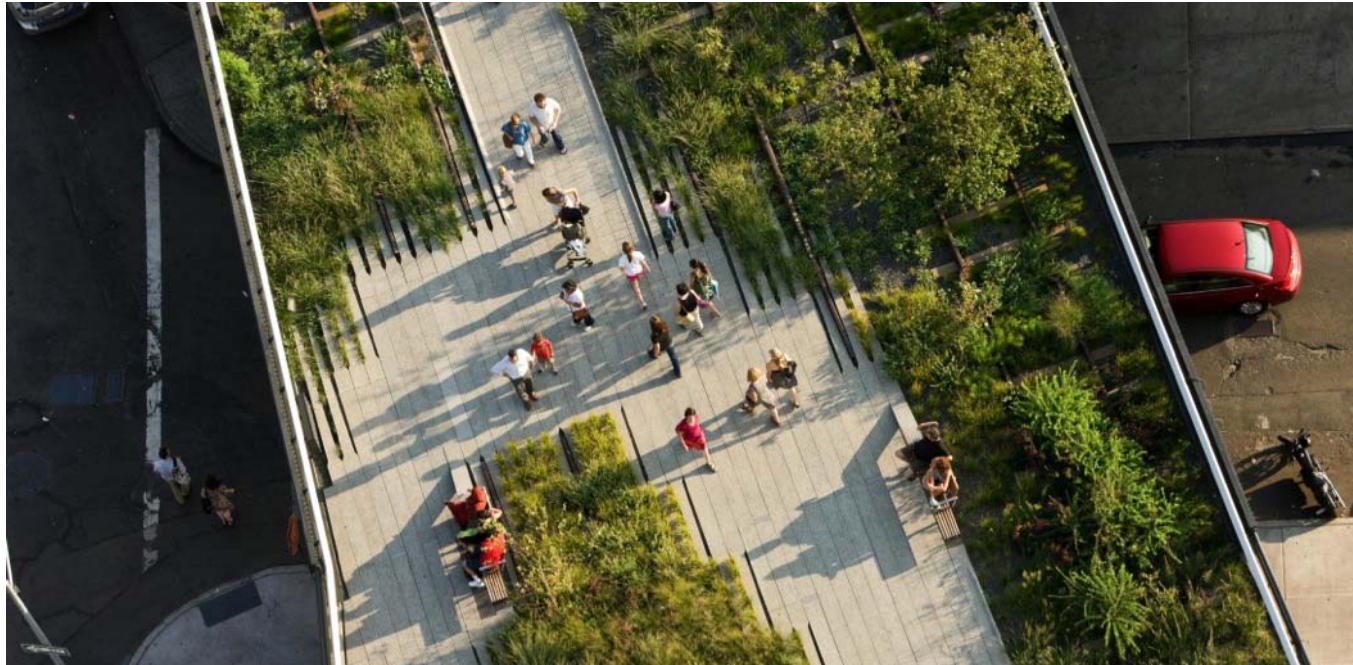
Engaging the Community to learn from their perspective and better understand opportunities and challenges



ACTIVE RECREATION

Policy Based on Health Evidence

Ensure that all New Yorkers live within a 10-minute walk of a park



Proximity to parks and recreational facilities is associated with higher levels of physical activity and healthier weight levels among youth and adults

(Sallis JF and Glanz K. Physical activity and food environments: solutions to the obesity epidemic. Milbank Quarterly. 2009;87(1): p. 123-154.)

Reusing Existing Outdoor Space

PLAN NYC: 180 Schoolyards to Playgrounds opened



ACTIVE RECREATION

When using playgrounds that are painted with designs for games and imaginative play, kids engage in moderate to vigorous activity for more than 50% of their recess period

Source: Stratton G and Mullan E. "The Effect of Multicolor Playground Markings on Children's Physical Activity Level During Recess." Preventive Medicine, 41(5-6): 828-833, 2005.



ACTIVE BUILDINGS

Exteriors: Contributing to the Pedestrian Realm

Maximize variety, detail, texture and continuity on the lower 1-2 floors of the building façade

Provide multiple entries and appropriate transparency



ACTIVE BUILDINGS

Americans, on average, spend approximately 90 percent of their time indoors

U.S. Environmental Protection Agency. 1989. Report to Congress on indoor air quality:
Volume 2. EPA/400/1-89/001C. Washington, DC.



Design and Physical Activity

Encouraging stair use & active transportation

Just **2 minutes** (about 6 floors) of **stair climbing a day** burns enough calories to prevent average U.S. adult annual weight gain.

Source: U.S. Centers for Disease Control and Prevention (CDC), The Guide to Community Preventive Services, www.thecommunityguide.org/pa/pa-int-create-access.pdf

Men climbing **20-34 flights of stairs per week** have a **29% lower risk of stroke**.

R.S. Paffenbarger Jr, R.T. Hyde, A.L. Wing and C.C. Hsieh, Physical activity, all-cause mortality, and longevity of college alumni, *N Engl J Med* 314 (1997), pp. 605–613.



BUILDING DESIGN STRATEGY

Promote Stair Use



Stairs to receive plenty of natural daylight



Art in stairs to increase visual interest



Stairs designed to invite users

BUILDING DESIGN STRATEGY

Stairs: Design and Aesthetics

Designed to invite users

- Daylighting
- Artwork
- Finishing



BUILDING DESIGN STRATEGY

Stairs: Signage and prompts



Stair prompts that encourage stair use for health benefits have been shown **increase stair use by a median of 50%**

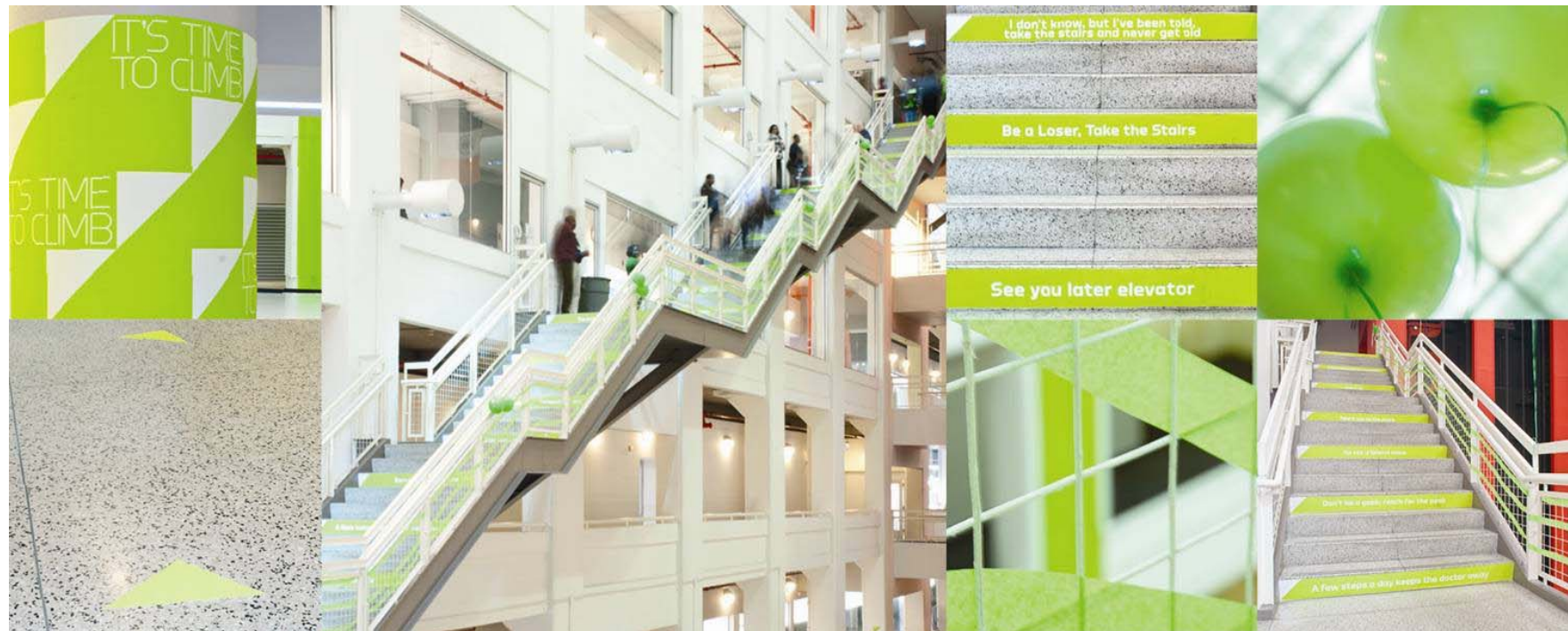
Guide to Community Preventive Services, Environmental and Policy Approaches to Physical Activity: Point-of-Decision Prompts to Encourage Use of Stairs, <http://www.thecommunityguide.org/pa/environmental-policy/podp.html> (last visited Dec. 20, 2011).



BUILDING DESIGN STRATEGY

Stairs: Programming

Motivational Signage placed at points of decision
Promoting stair use at work (i.e. Stair Week)



Co-benefits

Environmental sustainability

Storm Water Retention:

- Bioswales as part of street planting
- Increased area of pervious surface from parks

Improved Air Quality:

- More Trees
- Fewer Cars

Reduced use of fossil fuels:

- Fewer Car miles
- Clean fuel public transport
- Less elevator trip
- Less electricity used for electronics



Co-benefits

Universal accessibility

Streets designed for slower speeds of pedestrians

Crossing designed with curb cuts

Reduced crossing distances with refuge islands

Increased use of stair leads to readily available elevators



Co-benefits

Economic benefits

DOT study shows:

- 49% fewer commercial vacancies at Union Square plaza
- 172% Increase in retail sales at Pearl Street plaza and
- 14% increase in Sales at fronting businesses



Co-benefits

Community Resiliency and Social Engagement

Creating a more vibrant public realm supports economic and social health of communities, mental health of individuals



Co-benefits

Social Equity

Minority and lower-income people are more likely to live in neighborhoods with lower-quality sidewalks, fewer parks and recreation resources, and more danger from crime and traffic

Taylor W and Lou D. Do All Children Have Places to Be Active? Disparities in Access to Physical Activity Environments in Racial and Ethnic Minority and Lower-Income Communities. A Research Synthesis. Princeton, NJ: Active Living Research, Nov 2011



Results In New York City

**In New York City, 5.5 percent
decline in the number of obese
schoolchildren from 2007 to 2011**

