Designing Healthy Communities

Sam Corbett
Principal Transport Planner and Client Manager, Jacobs

George Weeks
Specialist Urban Designer
Auckland Council Design Office (City Centre Unit)
Objectively Healthy Cities

Urban design for the 21st century

George Weeks

@georgeweeks2014 18 September 2017
Quiz!: Public Health in OECD

Three interventions that reduce health inequalities and improve health?
Quiz!: Public Health in OECD

Three interventions that reduce health inequalities and improve health:

1. Water fluoridation
2. Mass vaccination
3. Transforming streets
Insufficiently active adults

Percentage of NZ adults undertaking <150 minutes exercise per week

Source: NZ Ministry of Health
Benefits of physical activity

Aerobics Center Longitudinal Study
~10,000 men
~3,000 women
8 years

P T Katzmarzyk, 2007; Physical Activity, Sedentary Behavior, and Health: Paradigm Paralysis or Paradigm Shift? Diabetes; Nov 2010; 59, 11

Benefits of physical activity

Cancer
Physical activity can reduce the risk of several types of cancer, including cancers of the breast, colon, prostate, and endometrium.

Cardiovascular disease
Regular physical activity is a protective factor for, and reduces the risk of, cardiovascular diseases, including CHD and stroke.

Obesity
Physical activity is a key element in maintaining healthy weight and the prevention of weight gain.

Mental health
Regular physical activity has psychological health benefits, and can lead to improvements in self-esteem and mood, and reduced anger, depression and anxiety.

Diabetes
Physical activity has a role to play in the prevention and management of diabetes.

Bone density
Physical activity can increase bone mineral density in adolescents, maintain it throughout adulthood, and slow its decline in old age.
Figure 5: Projected rates of obesity

Source: Obesity Update 2017, OECD
30.7%

Source: Obesity Update 2017, OECD
Types of Physical Activity

Physical Activity

Recreational

Utilitarian
Recreational Activity
Utilitarian Activity
Types of Physical Activity

Physical Activity

- Recreational: Behaviour - based, Individual scale
- Utilitarian: Circumstance - based, Environment - scale

People respond to their environment
Would you cycle here?

People respond to their environment

...or here?
Environmental response!
Cycling – good for you
Walkability

- Density
- Mix of uses
- Connectivity

Residents’ assessment of their neighbourhoods’ walkability

Researchers’ own prior assessment of degrees of walkability

Very strong correlation (p<0.0001)
“An *objectively measured* walkability index was significantly related to *objectively measured* moderate intensity physical activity in adults.”
Walkability + health

Walkability encourages exercise, irrespective of whether or not people have an expressed preference for it.

Van Dyk *et al* (2009)

Residents of walkable neighbourhoods always tend to undertake more physical activity.

Humans are designed for movement and have evolved to have high levels of energy expenditure.

P T Katzmarzyk, 2010; Physical Activity, Sedentary Behavior, and Health: Paradigm Paralysis or Paradigm Shift? Diabetes; 59,11

“Despite all the technological advances in modern medicine, regular physical activity is as close as we’ve come to a magic bullet for good health.”

Dr JoAnne E. Manson, Professor of Medicine, Harvard Medical School & Chief, Division of Preventive Medicine, Department of Medicine, Brigham and Women’s Hospital
Active travel is the only viable option for significantly increasing physical activity levels across London's whole population. The most significant role transport plays in the health of Londoners is enabling physical activity through walking, cycling and using public transport.

Improving the Health of Londoners - TfL (2014)
Transport & Health in London

Main impacts:

- Physical activity
- Air quality
- Road traffic collisions
Active travel and physical activity

Figure 9: Proportion of adults in London who could meet their physical activity needs through walking and cycling
London Walkability Model
Walkability Index Components

**Land Use Diversity**
- Shannon’s Evenness Diversity Index
- Base unit: Block

**Transport Accessibility**
- Tube/Rail and Bus Stop Density
- Base Unit: Point Locations

**Street Network Accessibility**
- Space Syntax Centrality Measures
- Base Unit: Street Segment

**Residential Density**
- Residential Address Density
- Base Unit: Block

**Data:**
- Address and land use data
- Bus and rail/tube stop locations
- Street network model
- Address data

**Outputs:**
- Surface representing land use diversity
- Two surfaces:
  1) Tube/rail accessibility
  2) Bus stop accessibility
- Surface representing each radius of closeness centrality calculation
- Surface representing residential density

All images: Dr Ashley Dhanani, UCL
Land use diversity

All images: Dr Ashley Dhanani, UCL
Residential density

All images: Dr Ashley Dhanani, UCL
London-wide model
Data surface showing walkability index for area of north London, comprising residential density, land-use diversity, street network and transport accessibility.
Marylebone High Street
“In your own jail”

Fritz Perls
(1893 – 1970)
Importance of utility

“There was...a difference between neighbourhoods regarding walking for errands. This...is consistent with transportation research that finds no differences in walking for exercise but finds significant differences in walking for transport purposes between high- and low walkability neighbourhoods”

Saelens et al, 2003
Cycling – similarly healthy?

There is a clear, positive, dose-response relationship between the amount of cycling and health outcomes:

- **Increases**
  - Fitness improvement
- **Decreases**
  - Risk of all cause mortality
  - CVD and colon cancer morbidity
  - Incidence of overweight and obesity

A review of 16 studies that specifically addressed the health benefits of cycling found the studies to be high in quality and to contain consistent results that supported the relationship between cycling, cardiovascular fitness, all-cause mortality, cancer risk, and overweight or obesity risk.

Health Benefits of Cycling: a systematic review (2011)
Cycling – good for you?

Walking, cycling, driving = similar risk of injury per hour

EXCEPT

Males aged 17 – 20: Driving = 5x risk of injury per hour

J.S. Mindell, D. Leslie & M. Wardlaw (2012); Exposure-Based, ‘Like-for-Like’ Assessment of Road Safety by Travel Mode Using Routine Health Data, PLoS ONE, 2012; 7 (12): e50606 DOI:
Cycling – good for you

Figure 10: Typical changes in mortality cost per person who switches from driving to cycling, €/yr

Source: Rabl, R and de Nazelle, A (2012)
Calculating the savings

Health Economic Assessment Tool

“Conduct an economic assessment of the health benefits of walking or cycling”

World Health Organization

Department for Transport
“Despite all the technological advances in modern medicine, regular physical activity is as close as we’ve come to a magic bullet for good health.”

Dr JoAnne E. Manson, Professor of Medicine, Harvard Medical School & Chief, Division of Preventive Medicine, Department of Medicine, Brigham and Women's Hospital
Recap
Implications

1. Neighbourhood walkability = objective measure
2. Walkability correlates with physical activity
3. Physical activity correlates with significantly lower levels of illness and better health
4. Walkable and bikeable mixed use environments contribute significantly to public health

= Objective, public health based justification for walkable, mixed use urban design
Designing Healthy Communities

Sam Corbett
18 September 2017
County of Los Angeles

- Most populous county in the US
- Larger than 42 individual US States
- 88 incorporated cities
- One of the most ethnically diverse counties in the US
Los Angeles – Birthplace of the Freeway
Obesity Epidemic

Trend in Obesity Prevalence Among 3-4 Year olds in the LA County WIC Program

Year

2003 2004 2005 2006 2007 2008

Prevalence (%)

0 10 20 30

16.3 17.2 16.3 17.2 21.1 22.6

3 year olds 4 year olds
**Costs of Obesity and Physical Inactivity**

<table>
<thead>
<tr>
<th>Economic Costs of Overweight, Obesity &amp; Physical Inactivity Among Adults in LA County, 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overweight and Obesity</strong></td>
</tr>
<tr>
<td><strong>Billions</strong></td>
</tr>
<tr>
<td>Health Care</td>
</tr>
<tr>
<td>Lost Productivity</td>
</tr>
<tr>
<td>Total:</td>
</tr>
</tbody>
</table>

**Total Cost:** $11.88 BILLION

Source: California Center for Public Health Advocacy, 2009.
Multi Pronged Effort to Reduce Obesity Rates

Community Action Plan

1) Adopt healthy food and beverage policies in eight cities
2) Adopt healthy food/beverage policies in three L.A. County departments
3) Improve school meal nutrition in four local districts, including LAUSD
4) Adopt nutrition and physical activity guidelines for preschools
5) Adopt policies to support breastfeeding in county and private firms
6) Increase teacher capacity to implement physical education requirements
7) Adopt or strengthen joint-use policies in school districts
8) Adopt land use policies to increase pedestrian activity and biking
Multi Pronged Effort to Reduce Obesity Rates

76% of parents strongly favor making fast food and chain restaurants post nutritional information on their menus, which is significantly higher than national rates for public support of menu labelling (56%).

60% of parents strongly favor putting signs in grocery stores as being either red light, yellow light, or green light food to help parents assess the healthiness of products.

60% of parents strongly favor limiting the amount of TV, video or computer screen time that children receive in child care settings.

57% of parents strongly favor requiring products that fast food restaurants sell to kids to meet strict nutritional standards.

56% of parents strongly favor reducing access to unhealthy snacks and sugary drinks in vending machines in schools, childcare facilities, and other public places.

Source: Achieving Healthy Weight Early in Life, Connecting the Dots
LA County Healthy Design Ordinance

Healthy Design Features
Creating safe, convenient and pleasant places

1. Pathways and trails
   - Trail thru-access
   - Thru-connections for cul-de-sacs

2. Mix of land uses
   - Mixed uses within buildings and block
LA County Healthy Design Ordinance

Healthy Design Features
Creating safe, convenient and pleasant places

3. Block design

4. Street design

Residential Blocks: 250-600 Feet
Commercial Blocks: 300-500 Feet

Maximum block perimeters

New public, private street standards

Charlotte, NC
LA County Healthy Design Ordinance

Healthy Design Features
Creating safe, convenient and pleasant places

5. Transit facilities

New York City
Bike amenities near transit

6. Parks/civic spaces

Squares, plazas, playgrounds
Smaller decentralized spaces
LA County Healthy Design Ordinance

Healthy Design Features
Creating safe, convenient and pleasant places

7. Buildings

Old Town Pasadena
Minimum 2 stories, minimal setback

8. Landscaping

Berkeley, CA
Appropriate type, interval for shade
## LA County Healthy Design Ordinance

### Healthy Design Features
*Creating safe, convenient and pleasant places*

<table>
<thead>
<tr>
<th>9. Parking</th>
<th>10. Walls, fences, porches</th>
</tr>
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<tbody>
<tr>
<td><img src="image1" alt="Parking Image" /></td>
<td><img src="image2" alt="Walls, fences, porches Image" /></td>
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</table>

- **9. Parking**
  - Trader Joe's (Chicago)
  - Cars in back, bikes in front

- **10. Walls, fences, porches**
  - Clearly defined public, private space
LA County Healthy Design Ordinance

Healthy Design Features
Creating safe, convenient and pleasant places

11. Lighting

12. Signs

Shorter, lower wattage, more frequent

Smaller size near sidewalks

London
LA County Obesity Rates (2003 – 2014)

Obesity Rates Among 3 and 4 year olds

Healthy Design Ordinance Adopted
Lessons Learnt

• The built environment does have an impact upon our health and well being and we should be designing places to promote physical activity in the form of walking, cycling and exercise

• Safety, convenience and creating great/vibrant places are key principles in designing healthy communities

• It is possible to change – in fact, it is the ONLY option as the status quo is not acceptable
Healthy Design Photo Album – NYC Pilot Plazas
Healthy Design Photo Album – Pedestrian Friendly Spaces
Healthy Design Photo Album – Design Streets (and Bridges) for All Modes
Healthy Design Photo Album – Provide for Cyclists
Healthy Design Photo Album – Place Activation
Healthy Design Photo Album – Parklets or Pocket Parks

Oakland, CA

San Francisco, CA
Healthy Design Photo Album – Pedestrian Crossings

Montreal, Quebec

Los Angeles, CA
Healthy Design Photo Album – Ciclovias/Open Streets
Healthy Design Photo Album – Drinking Fountains
### Healthy Design Photo Album – Cycle Parking

<table>
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<th>Wall of Fame</th>
<th>Wall of Shame</th>
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<tr>
<td><img src="image1" alt="Wall of Fame Image" /></td>
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<td>• Bicycle parking structure</td>
<td>• This is what happens when cycle parking is not provided</td>
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<tr>
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**Wall of Fame**
- Bicycle parking structure
- Amsterdam, NL
- Where did I put my bike?

**Wall of Shame**
- This is what happens when cycle parking is not provided
Healthy Design Photo Album – Public Restrooms

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Healthy Design Photo Album – Universal Access

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<tr>
<td>[Image of a well-designed accessible sidewalk]</td>
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Thank you
Any questions?

Source: www.eltis.org / Harry Schiffer

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