The relationship between physical activity and walkability

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We don’t get enough exercise

- 35% meet minimum level of 150 minutes of moderate intensity activity per week

An ecological model of 4 domains of physical activity.

Policy Environment

Built Environment

Social/Cultural Environment

Physical Activity Domains

Individual

Biological
Psychological
Skills

Recreation

Transportation

Occupation (school)

Household

Social support
Social norms
Media models

Location of workplace/school
- access to transit
- access to sidewalks & bike paths

Building design
- stairways
- parking placement

Physical education policies

School siting policies

School grounds design standards

Provision of activity programs & facilities

Building codes

Location of workplace/school
- access to transit
- access to sidewalks & bike paths

Parking standards

Transportation funding

Pedestrian & bicycle facilities
- access
- connectivity
- design
- quality
- safety

Zoning & development codes

Walkable community design
- density
- connected streets
- mixed landuses
- access to transit

Trees & aesthetics

Private recreation facilities

Pedestrian & bicycle facilities

Parks & trails
- access
- design
- quality

Sidewalk requirements & standards

Tax treatment of private facilities

Park budgets & design standards

Tax treatment of exercise equipment

Building codes

Zoning codes for density & parking

Home design
- stairs
- exercise
- labor-saving
- entertainment

Media models

Social support

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HEALTH IS WHERE WE LIVE, LEARN, WORK & PLAY

Better Transportation Options = Healthier Lives

HEALTH IN COMMUNITIES WITH BETTER TRANSPORTATION OPTIONS

Walkable, bikable, transit-oriented communities are associated with healthier populations that have:

- More physical activity
- Lower body weight
- Lower rates of traffic injuries
- Less air pollution
- Improved mobility for non-drivers

"NewPublicHealth.org"
‘Walkability’

- Residential Density
- Intersection Density
- Land Use Mix
- Net Retail Area
- Safe
- Convenient
- Attractive
Walkability Index

Highly Walkable Areas:
• Generally Inner City
• High Density
• Highly Mixed land Use
• High number of network nodes

Low Walkable Areas:
• Generally Peripheral Edge of city & Semi - urban
• Low Density
• Low land Use Mix (typically residential)
• Low number of network nodes
Residents of walkable neighborhoods are more likely to meet physical activity guidelines.

- **High walkability:** 37%
- **Low walkability:** 18%

Accelerometer-based MVPA Min/day in Walkability-by-Income Quadrants

Walkability:  $p = .0002$
Income:  $p = .36$
Walkability X Income:  $p = .57$

Dose–response relationship of perceived Walkability Index with weekly minutes of transport-related walking by study site

THE ROLE OF Transportation IN PROMOTING PHYSICAL ACTIVITY

TRAFFIC CALMING
Medians, speed bumps and other traffic-calmining efforts can reduce the number of automobile crashes with pedestrian injuries by up to 15%.

PUBLIC TRANSPORTATION
Public transit users take 30% more steps per day than people who rely on cars.

SIDEWALKS
People who live in neighborhoods with sidewalks on most streets are 47% more likely to be active at least 30 minutes a day.

BIKE FACILITIES
In Portland, Ore., bicycle commuters ride 49% of their miles on roads with bike facilities, even though these are only 8% of road miles.
Future Developments
Walk Score

The map shows a Walk Score of 78, indicating it is a very walkable area. Most errands can be accomplished on foot.
New Walkability App for Android

Dundas St W, Toronto

Location:
- Street: Dundas St W
- Town/City: Toronto
- Country: Canada

% People walking to work: 44%

MAP

308 Dundas Street West, Toronto, Ontario
Address is approximately

Overall rating: 1.9
Road safety: 0.5
Easy to cross: 0.5
Pavement/Sidewalk: 2.5
Hilliness: 4.5
Navigation: 2.5
Fear of crime: 0.5
Smart & beautiful: 2.0
Fun & relaxing: 2.0

Was this review helpful to you?
THE PARC STUDY: PHYSICAL ACTIVITY AND THE REJUVENATION OF CONNSWATER

- 8 year natural experiment evaluation
  - 9km linear park
  - 19kms of foot and cycle paths
  - To benefit 40,835+ people daily

- NPRI Funded PARC study (£1.1M)
  - Before and after household survey
  - Spatial data analysis
  - Economic and behavioural economics analysis
  - Programme evaluation
Cohort
- Feb 2010-Jan 2011
- 1209 adults (16+)
  residing in wards 1 mile from the greenway

Measures
- Global PA Questionnaire
- GIS measured walkability
- Perceptions of the environment
- Social capital and support for PA
- PA attitudes, self-efficacy, outcome expectancy
- SF-8 (Physical & mental health)
- Socio-demographics (sex, age, BMI, income, no.cars)
## Results – overall PA; $R^2=0.11$

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Standardised estimate</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N’hood attractive for PA</td>
<td>-0.13</td>
<td>0.01</td>
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<tr>
<td>Infrastructure to support PA</td>
<td>0.15</td>
<td>p&lt;0.0001</td>
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<tr>
<td>Social Support for PA</td>
<td>0.06</td>
<td>0.046</td>
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<tr>
<td>Age</td>
<td>-0.22</td>
<td>p&lt;0.0001</td>
</tr>
<tr>
<td>SF8 Physical Score</td>
<td>0.13</td>
<td>p&lt;0.0001</td>
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</tbody>
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Urban greenways have the potential to increase physical activity levels cost-effectively

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Table 4 Incremental cost-effectiveness ratio calculations for scenarios A, B and C

<table>
<thead>
<tr>
<th>Scenario (estimate of effect)</th>
<th>Discounted construction and maintenance costs</th>
<th>Discounted disease cost savings</th>
<th>Incremental costs</th>
<th>Total DALYs saved</th>
<th>Total discounted DALYs saved</th>
<th>£/DALY</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (2%)</td>
<td>£6,857,811</td>
<td>£2,118,111</td>
<td>£6,646,000</td>
<td>1,479.25</td>
<td>361</td>
<td>£18,410.82</td>
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<tr>
<td>B (5%)</td>
<td>£6,857,811</td>
<td>£481,179</td>
<td>£6,376,633</td>
<td>2,959.24</td>
<td>722</td>
<td>£8,830.10</td>
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<tr>
<td>C (10%)</td>
<td>£6,857,811</td>
<td>£946,088</td>
<td>£5,911,723</td>
<td>5,420.19</td>
<td>1,323</td>
<td>£4,469.45</td>
</tr>
</tbody>
</table>

DALY, disability-adjusted life year.
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Thanks for Listening

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