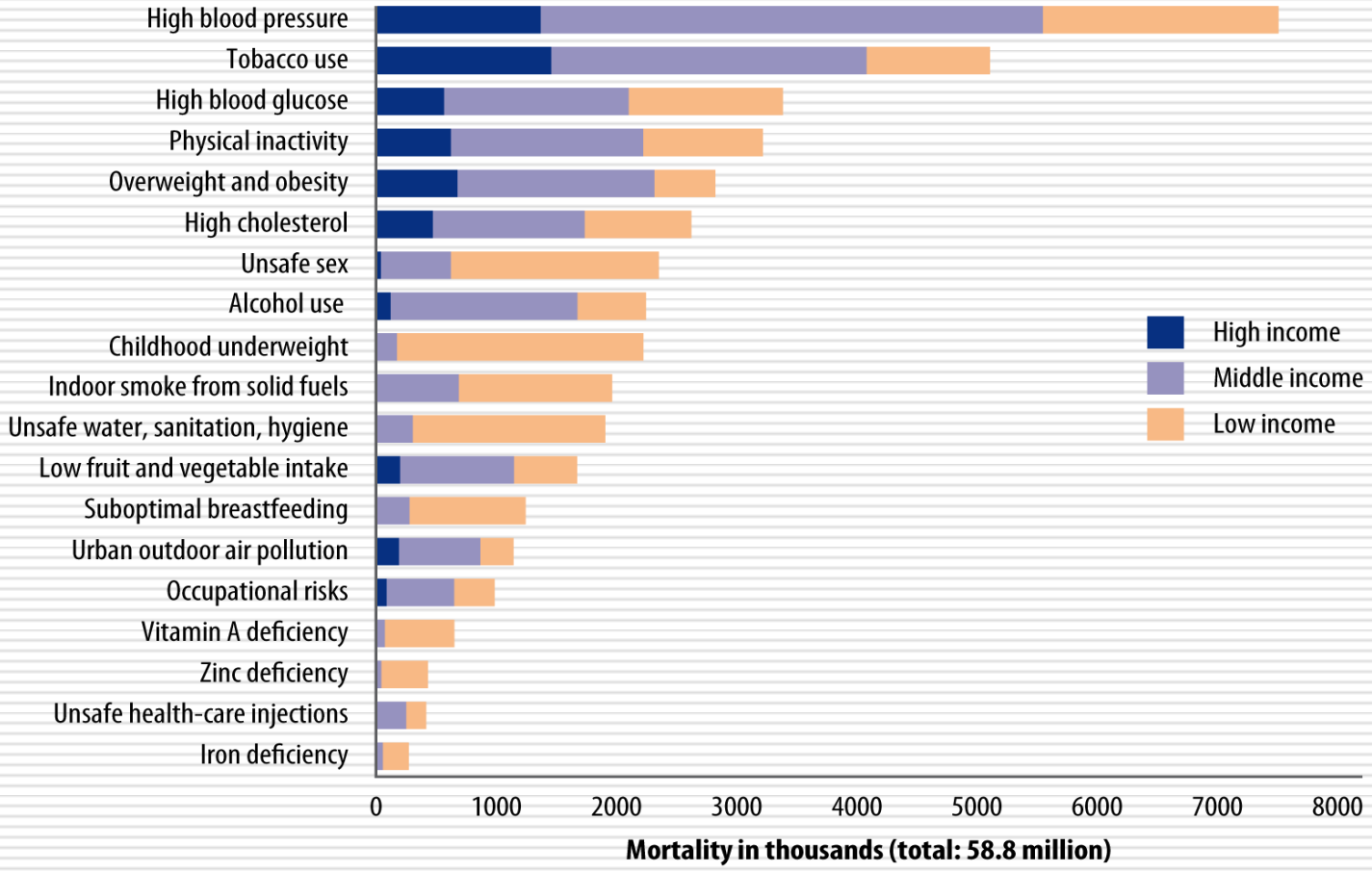
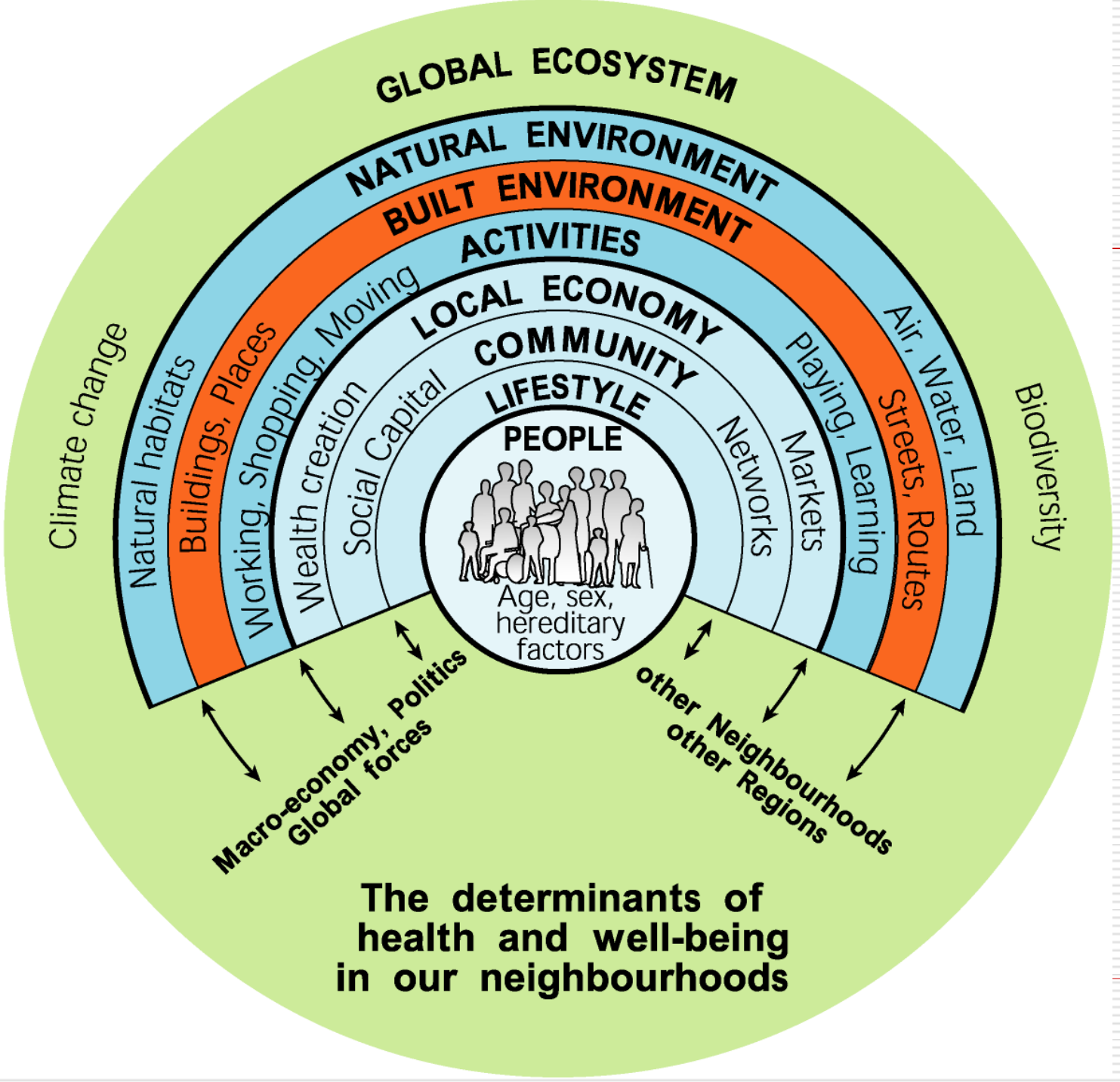
Understanding Walkability

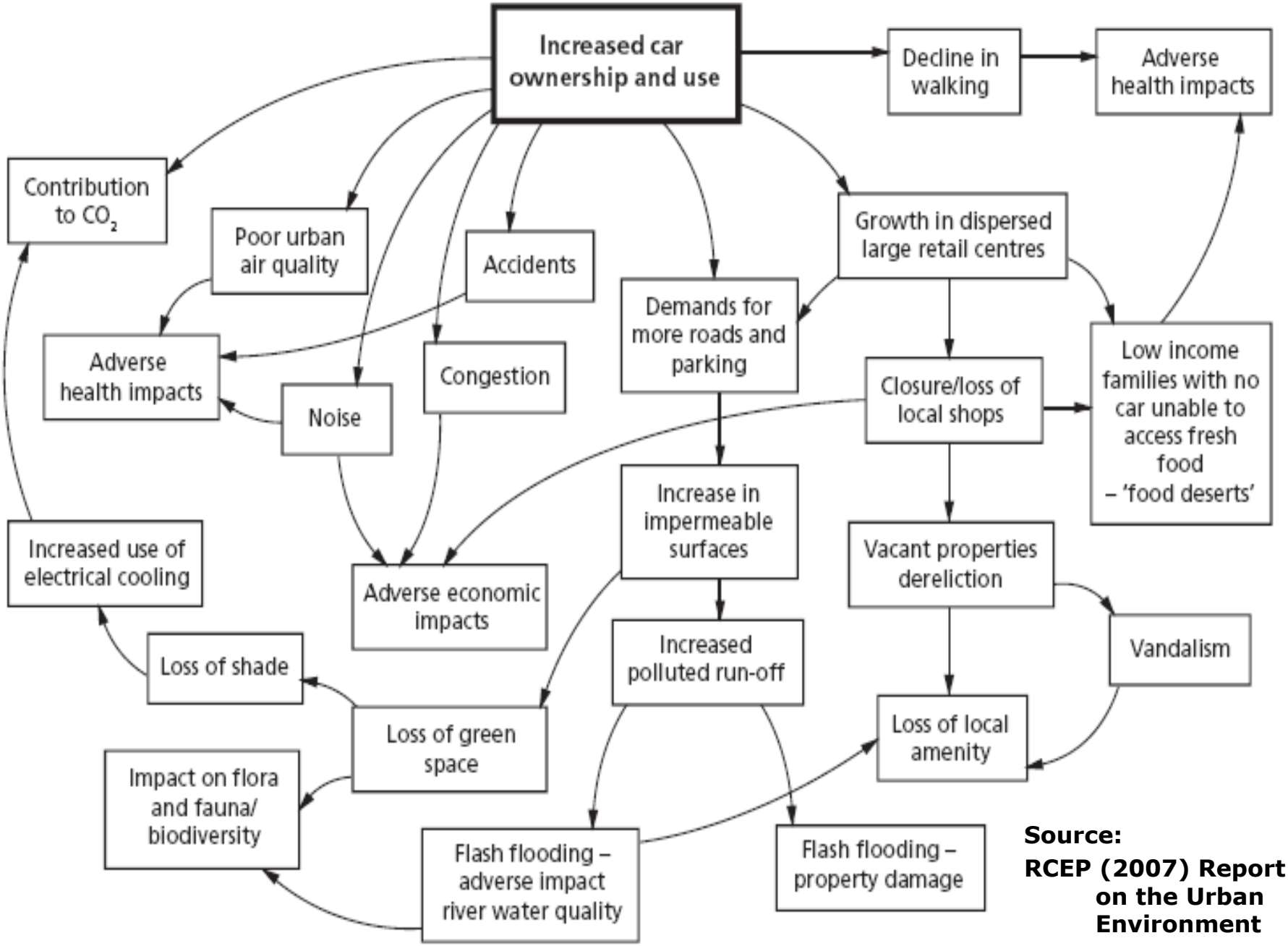
Deaths attributed to 19 leading factors, by country income level, 2004



Health and the built environment

- Interventions in the built environment can improve health by:
  - Reducing inequalities in access to housing, facilities and transport;
  - Reduce air and water pollution;
  - Improving 'liveability' of streets;
  - Increasing incidental physical activity.


GLOBAL ECOSYSTEM
NATURAL ENVIRONMENT
BUILT ENVIRONMENT
ACTIVITIES
LOCAL ECONOMY
COMMUNITY
LIFESTYLE
PEOPLE
Age, sex, hereditary factors
Natural habitats
Buildings, Places
Working, Shopping, Moving
Wealth creation
Social Capital
Networks
Markets
Playing, Learning
Streets, Routes
Air, Water, Land
Climate change
Biodiversity
Macro-economy, Politics
Global forces
other Neighbourhoods
other Regions
The determinants of health and well-being in our neighbourhoods



Source:
RCEP (2007) Report on the Urban Environment

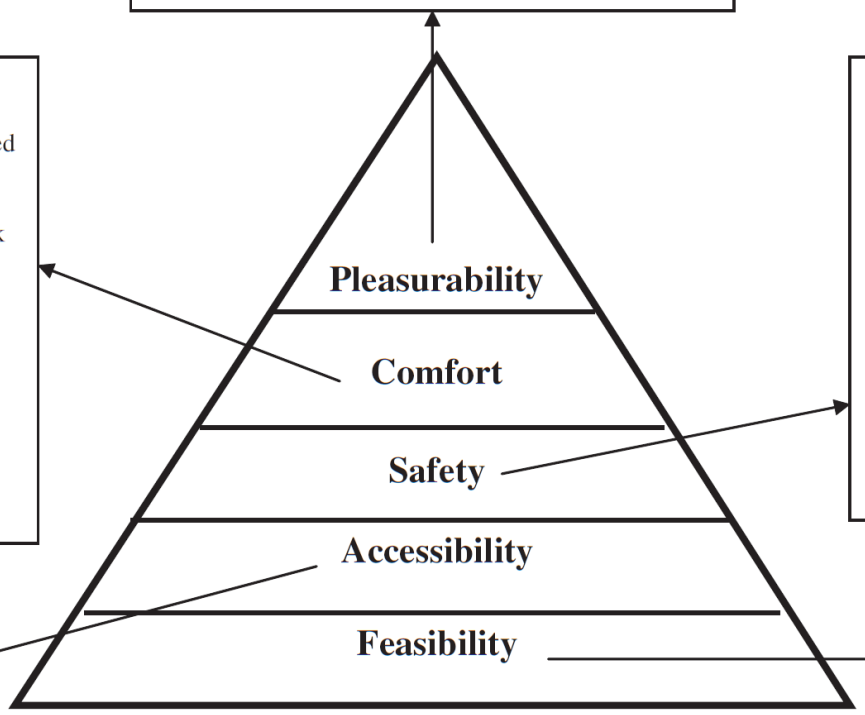
Physical activity and the built environment

- Levels of physical activity influenced by:
  - Travel patterns between home, work and other activities;
  - Mode of travel;
  - Types of recreation;
  - Energy-saving technology;
  - Safety and fear of crime;
  - Poor quality public realm.
- Obesogenic environments and complex issues of causality.

Walking and the built environment

- The focus on walking….
- Environmental influences:
  - e.g. people near parks walk for 21 mins more per week;
  - e.g. for every local shop, residents walk-5-6 mins more per week;
  - Suggested that environment could add 15-30 min more walking per week.
- Interventions impacts across entire community … permanently.

A hierarchy of walking needs (Alfonso 2005)



Includes factors such as
- Diversity and complexity
- Liveliness (activity level)
- Architectural coherence and scale
- Aesthetic appeal

May be operationalized as
- Presence of a varied streetscape, mixed uses, architectural elements, historic or unique architecture, color, etc.
- Presence of public space
- Presence of other people, street vendors, outdoor dining areas, etc.

Includes factors such as
- Urban design characteristics that affect the relationship between pedestrians and motorized traffic
- Urban design characteristics related to the pedestrian walkway system and street network
- Urban design amenities

May be operationalized as
- Presence of traffic calming features (e.g., roundabouts, medians, curb bulb-outs, etc.)
- Width of the street, length of blocks, width of sidewalk, presence of sidewalk buffers, street trees, etc.
- Street furniture, arcades, canopies, water fountains, etc.

Includes factors such as
- Urban design characteristics related to physical incivilities and fear of crime
- Types of land uses
- People present

May be operationalized as
- Presence of graffiti, litter, abandoned buildings, 1st-floor windows, etc.
- Presence of bars, liquor stores, pawnshops, etc.
- Presence of threatening or loitering individuals, etc.

Includes factors such as
- The pattern, quantity, quality, variety and proximity of activities present
- Connectivity between uses
- Walking-related infrastructure

May be operationalized as
- Presence/completeness of sidewalk network
- Presence/number of barriers
- Distance to destinations
- Number of destinations, etc.

Includes factors such as
- Mobility
- Time
- Responsibilities

May be operationalized as
- Number of adults in household
- Number of children in household
- Childcare responsibility, etc.
- Age, health or physical mobility

What are 'Walkable' Environments?

- Pedestrian friendly neighbourhoods with access to local amenities and well-designed public open space.
- Walking positively associated with:
  - Residential density;
  - Land use mix;
  - Connectivity;
  - Lack of slope;
  - Street lights;
  - Open water;
  - Public transport
  - Shops…

Measuring "walkability"

- Self reported environmental perceptions:
  - E.g. Neighborhood Environment Walkability Scale (NEWS)
- Environmental audits:
  - e.g. Measurement Instrument for Urban Design Quantities Related to Walkability
- "Objective" GIS modelling:
  - Walkability indices e.g. "Walk Score".

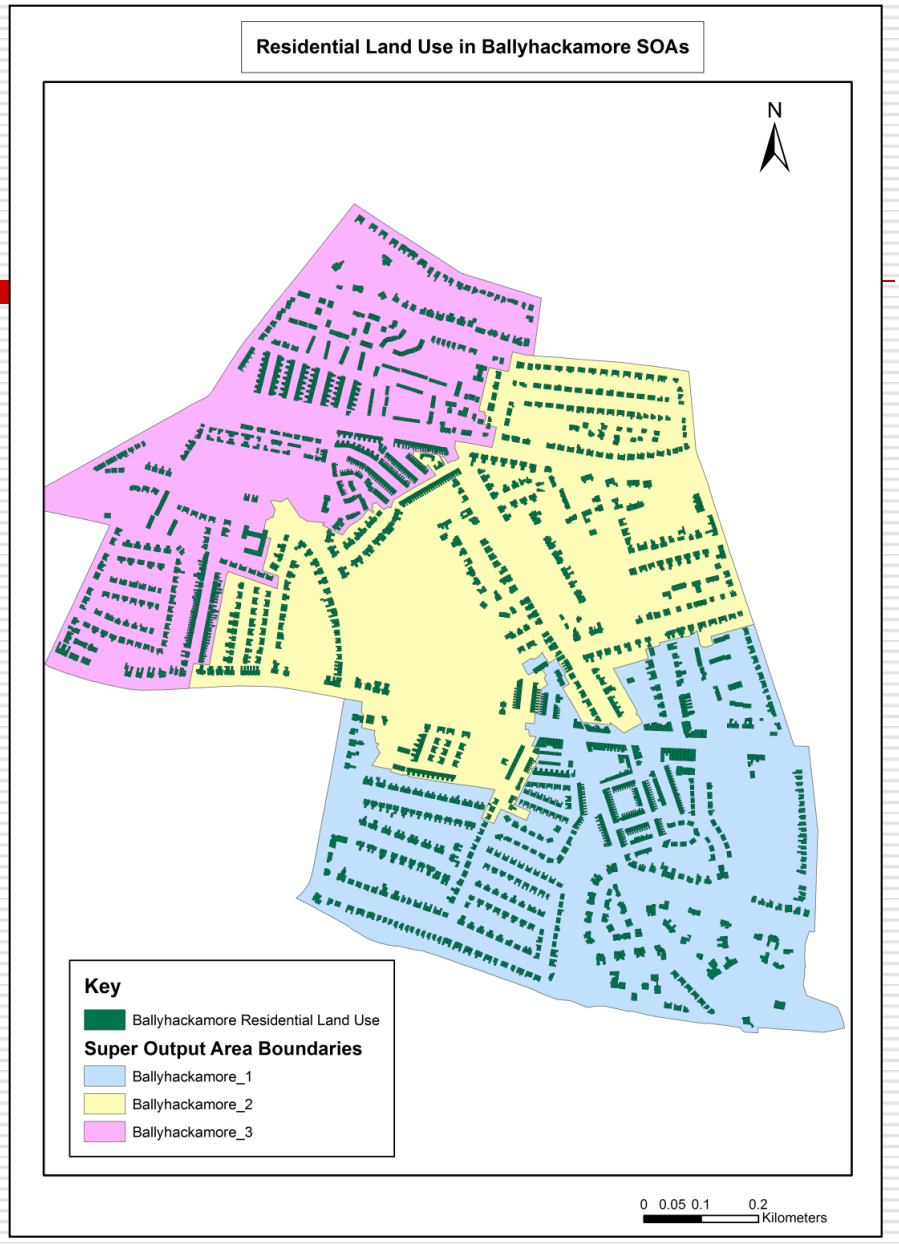
http://www.walkscore.com/

Measuring ‘Walkability’ using spatial data

- Standard walkability indices combine the following spatial data into a single measure (e.g. Frank et al 2010):
  - Residential density;
  - Connectivity (i.e. road interconnections);
  - Land use mix;
  - Retail floor area ratio (as indicator of car dependency).

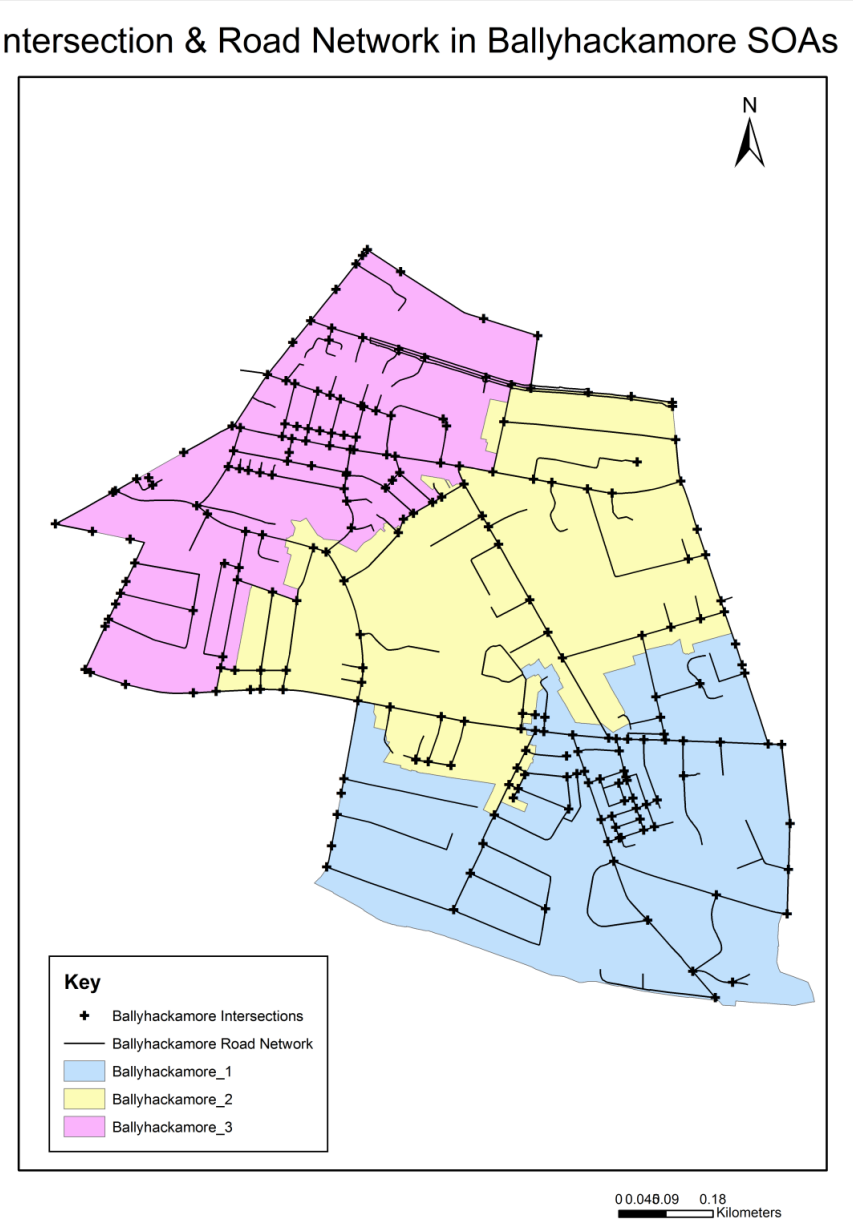
Residential Density

- Total Residential Area
- Number of Households
- Reclassified into Deciles and given a score of 1-10



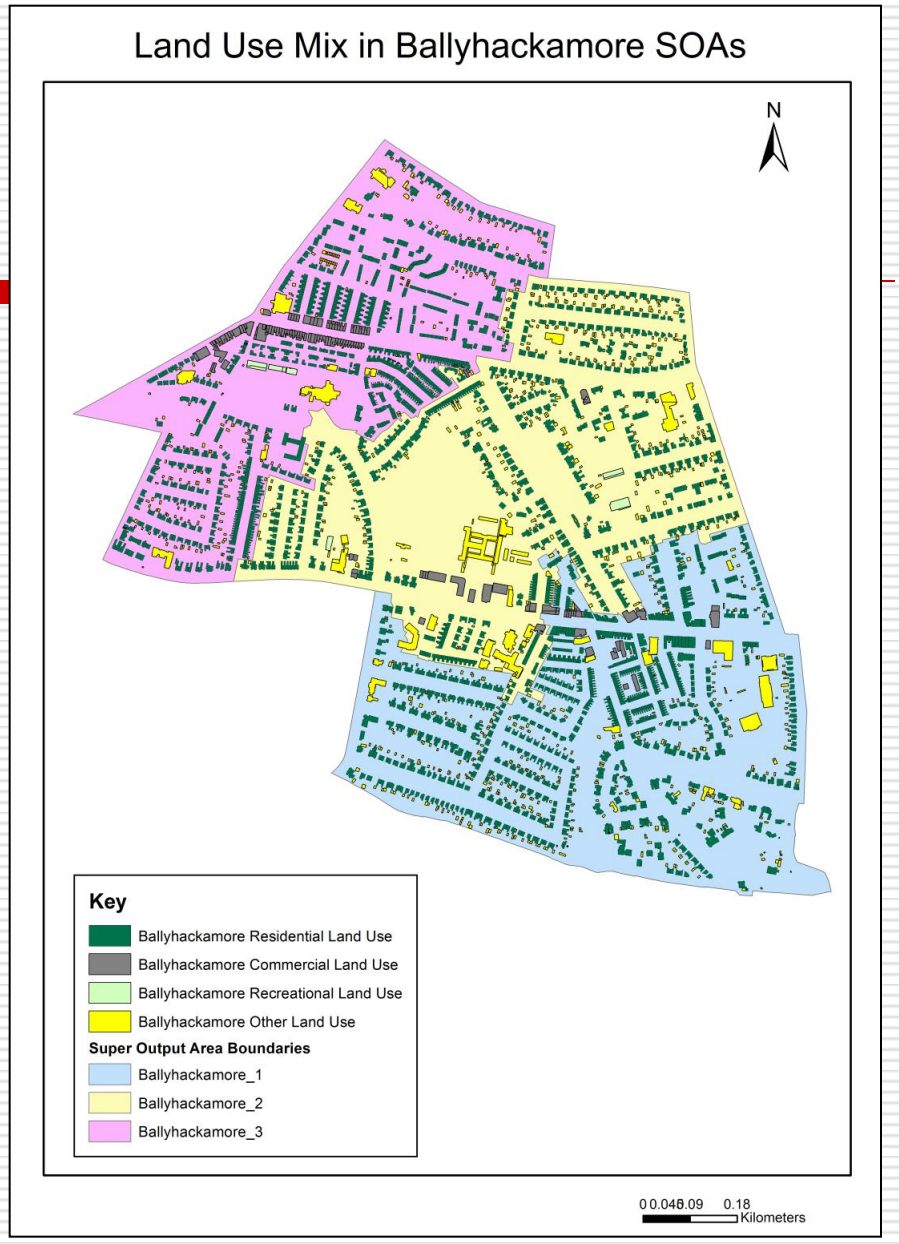
Intersection Density

- Intersections with 3 'legs'
- SOA Area
- Reclassified into Deciles and given a score of 1-10



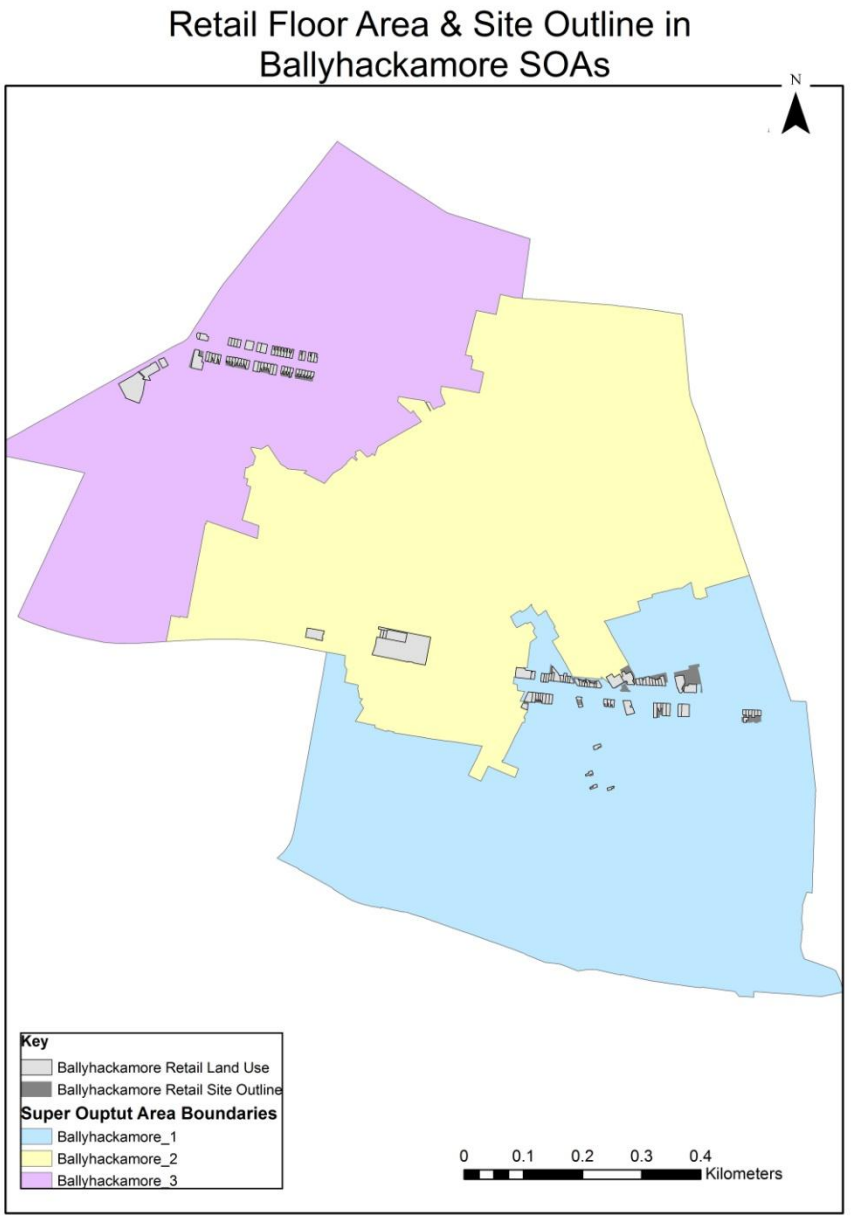
Land Use Mix

- 5 General Land Uses
  - Residential
  - Commercial
  - Industrial
  - Recreational
  - Other
- Total Land Use Area
- Land Use Mix= A/(ln(N))
  - Where A = [(b1/a) * (ln b1/a)] + [(b2/a) * (ln b2/a)] + [(b3/a) * (ln b3/a)] + [(b4/a) * (ln b4/a)] + [(b5/a) * (ln b5/a)]
  - Where N = Total Number of Land Uses present >0
  - Where b = Land Use Type
- Reclassified into Deciles and given a score of 1-10



Retail Floor Area Ratio

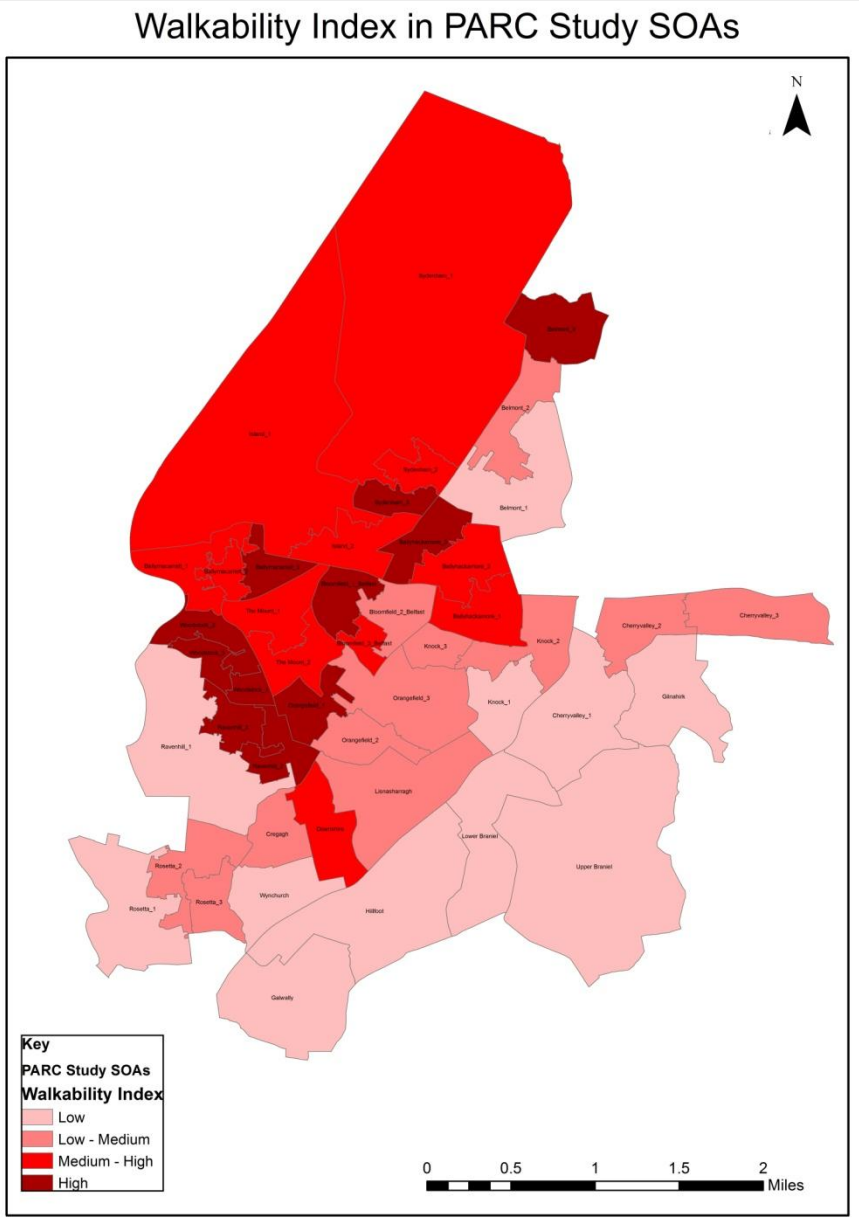
- Retail Land Use
- Retail Land Use Site Boundary
- Reclassified into Deciles and given a score of 1-10



Baseline Walkability Index

- Highly Walkable Areas of PARC Study SOAs characterised by
  - Generally Inner City
  - High Density
  - Highly Mixed land Use
  - High number of network nodes

- Low Walkable Areas of PARC Study SOAs characterised by
  - Generally Peripheral Edge of city & Semi - Rural
  - Low Density
  - Low land Use Mix (typically residential)
  - Low number of network nodes



Alternative Measures of Connectivity

- PedShed
- Link-Node Ratio
- Pedestrian Route Directness
- Metric Reach
- Directional Reach