Neighborhood and Health Outcome

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1. Neighborhood Built Environment

Tsinghua University

Definition of "Neighborhood"

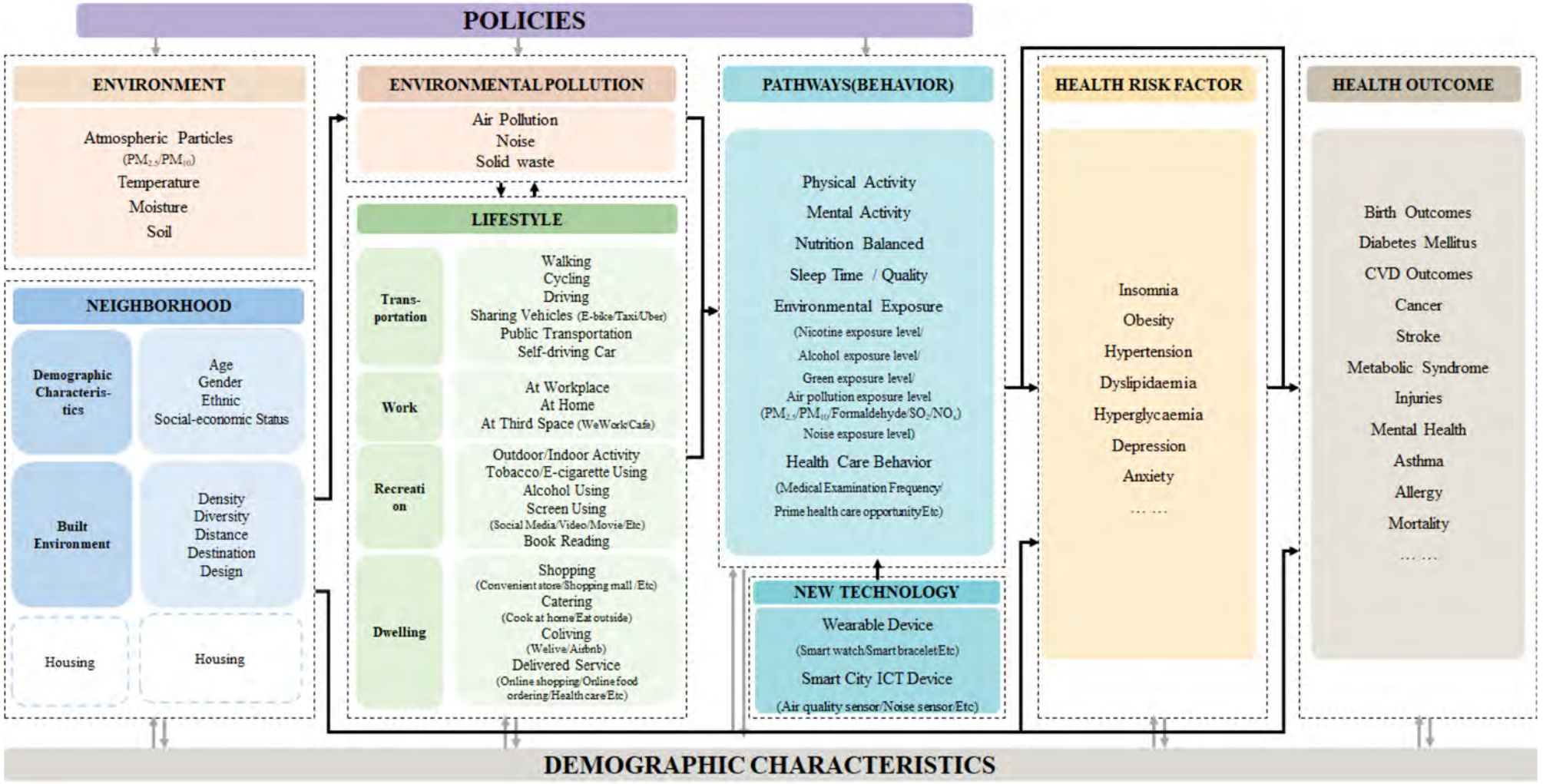
Country	United Kingdom	China	Canada
Definition	'Neighbourhood' has increasingly been recognised as a significant **socio-spatial** concept in UK policy, most notably in the UK government's 'Sustainable Communities' initiative launched in 2003, as well as in the establishment of the Neighbourhood Renewal Unit in 2001 (Propper et al , 2004).	Residential neighborhood, also known as "residential communities", are **divided by urban roads and natural feeder lines** (such as rivers) and are not complete residential areas that are traversed by traffic trunks. Residential communities generally set up a set of grassroots professional service facilities and management institutions that can meet the daily needs of residents (Wang & Huang, 2007).	Enumeration areas (EAs), which could be one of the spatial definition of neighborhood, are the smallest geographical units for which census counts can be retrieved by automatic means: Each one contains a minimum of 375 dwellings in large urban areas and a minimum of 125 dwellings in rural areas (Statistics Canada, 1992).
Concept	A socio-spatial unit.	A spatial unit with definite geographical entity.	A socio-spatial unit.

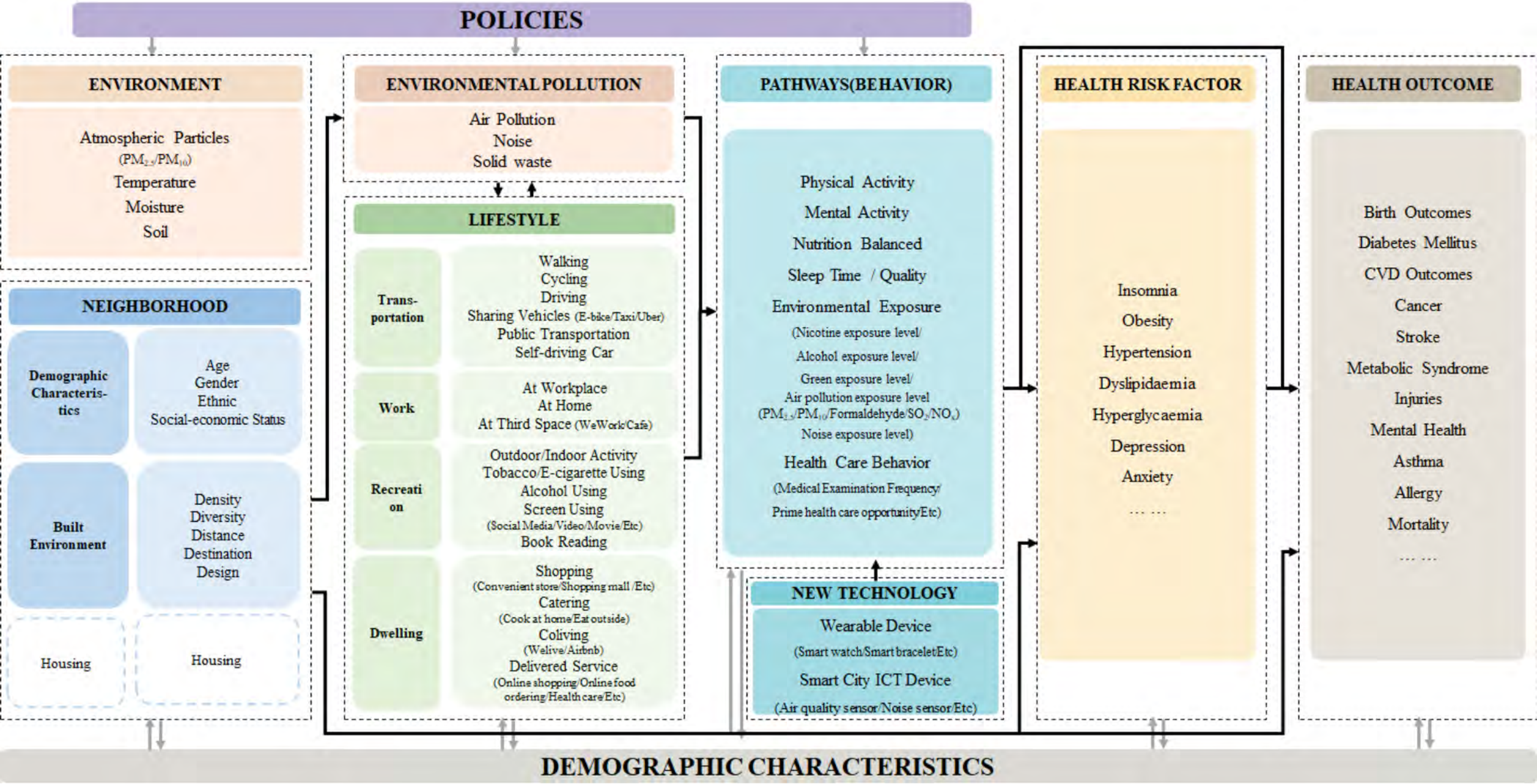
Country	Bangladesh	Ghana	Iran
Definition	Neighborhood defined as the **civil administrative unit called a mouza**, which was used as the primary sampling unit. Neighborhood measures are aggregates of survey responses (Koenig et al, 2003). Neighborhood defined as the **moholla** or **village**. Neighborhood variables are defined by aggregating individual responses, not including the respondent (Naved and Persson, 2005).	The units of data collection by the Ghana government are **enumeration areas** (EAs). EAs are generally aggregated, by officials, into urban sub-areas for city and metropolitan service organization. There have evolved over time unofficial neighborhoods that are well known sub-areas. We call these "traditional" urban sub-areas ***vernacular neighborhoods***, which have evolved into planning districts for housing, transportation and many social services such as health clinics (Getis, 2015).	In the traditional context, a neighborhood is the **original cell** of the city, **settlement of a specific ethnic group, race, religion or sect**. In its process of formation, the urban society colored by the tribal system was created by the sets that were known as neighborhoods(Farah et al , 2013).
Concept	A socio-spatial unit.	A socio-spatial unit.	A socio-spatial unit.

A framework of the association between neighborhood and health outcome

A simplified framework of neighborhood, lifestyle, behavior, health risk factor and health outcome.

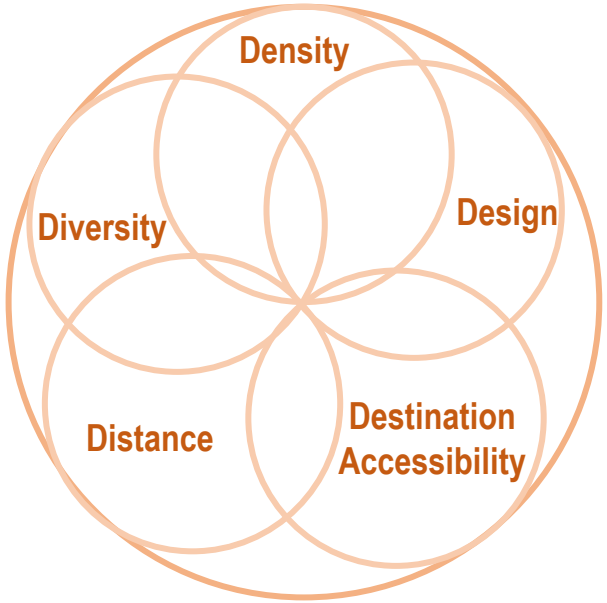
Neighborhood factors determine how people move around the city and neighborhood and what people do in their daily time. How people move and what people do in their daily time could determine the behavior that related to the health, such as physical activity, diet and sleep, which in turn determines the health risk factor and health outcomes. For example, building infrastructure for cars increases car use, air pollution, noise, heat island effects, and stress, and reduces walking and outdoor activities and in turn enhances physical inactivity, leading to increased morbidity and premature mortality.




POLICIES
ENVIRONMENT
Atmospheric Particles
($PM_{2.5}$/PM_{10})
Temperature
Moisture
Soil
NEIGHBORHOOD
Demographic Characteris-tics
Age
Gender
Ethnic
Social-economic Status
Built Environment
Density
Diversity
Distance
Destination
Design
Housing
Housing
ENVIRONMENTAL POLLUTION
Air Pollution
Noise
Solid waste
LIFESTYLE
Trans-portation
Walking
Cycling
Driving
Sharing Vehicles (E-bike/Taxi/Uber)
Public Transportation
Self-driving Car
Work
At Workplace
At Home
At Third Space (WeWork/Cafe)
Recreati on
Outdoor/Indoor Activity
Tobacco/E-cigarette Using
Alcohol Using
Screen Using
(Social Media/Video/Movie/Etc)
Book Reading
Dwelling
Shopping
(Convenient store/Shopping mall /Etc)
Catering
(Cook at home/Eat outside)
Coliving
(Welive/Airbnb)
Delivered Service
(Online shopping/Online food ordering/Health care/Etc)
PATHWAYS(BEHAVIOR)
Physical Activity
Mental Activity
Nutrition Balanced
Sleep Time / Quality
Environmental Exposure
(Nicotine exposure level/
Alcohol exposure level/
Green exposure level/
Air pollution exposure level
($PM_{2.5}$/PM_{10}/Formaldehyde/SO_2/NO_x)
Noise exposure level)
Health Care Behavior
(Medical Examination Frequency/
Prime health care opportunity/Etc)
NEW TECHNOLOGY
Wearable Device
(Smart watch/Smart bracelet/Etc)
Smart City ICT Device
(Air quality sensor/Noise sensor/Etc)
HEALTH RISK FACTOR
Insomnia
Obesity
Hypertension
Dyslipidaemia
Hyperglycaemia
Depression
Anxiety
... ...
HEALTH OUTCOME
Birth Outcomes
Diabetes Mellitus
CVD Outcomes
Cancer
Stroke
Metabolic Syndrome
Injuries
Mental Health
Asthma
Allergy
Mortality
... ...
DEMOGRAPHIC CHARACTERISTICS

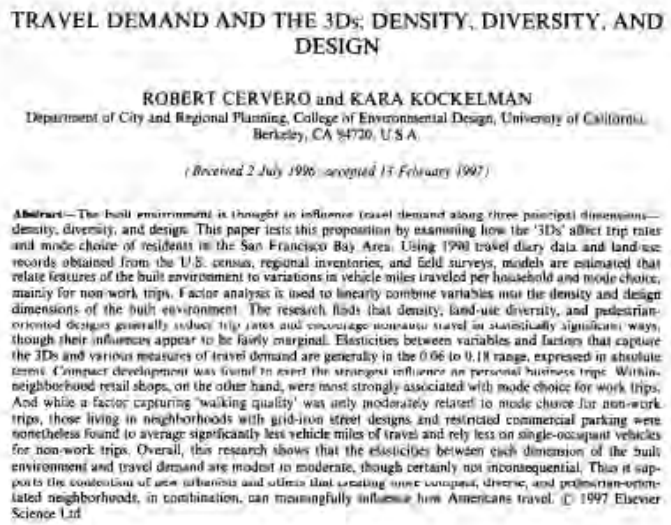
Theory - 5D for measuring neighborhood built environment

There have been many studies that examined the relationship between built environment and physical activities, health outcomes. Most indicators for the built environment are centered around "5D", which includes Density, Diversity, Design, Distance and Destination accessibility.



- Density, Diversity and Design are disseminated as three of the most important dimensions (Cervero & Kockelman, 1997), which could lead to lower usage of the automobile and a denser urban fabric, consequently, less consumption of fossil fuel and concentrated opportunities and services.

- Two new criteria of the built environment were later added: Destination accessibility and Distance (Ewing & Cervero, 2001). Destination accessibility refers to the ease of access to attractions, and Distance is the factor measured as an average of the shortest street routes from the residences or workplaces to the nearest destination.

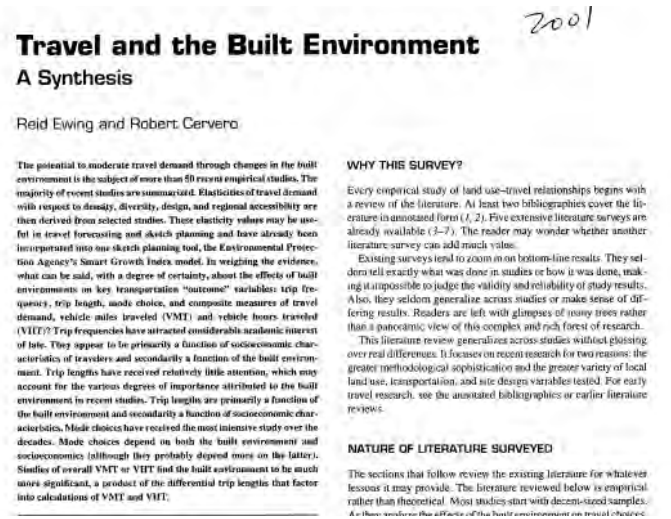

TRAVEL DEMAND AND THE 3Ds: DENSITY, DIVERSITY, AND DESIGN

ROBERT CERVERO and KARA KOCKELMAN

Department of City and Regional Planning, College of Environmental Design, University of California, Berkeley, CA 94720, U.S.A.

(Received 2 July 1996; accepted 13 February 1997)

Abstract—The built environment is thought to influence travel demand along three principal dimensions—density, diversity, and design. This paper tests this proposition by examining how the '3Ds' affect trip rates and mode choice of residents in the San Francisco Bay Area. Using 1990 travel diary data and land-use records obtained from the U.S. census, regional inventories, and field surveys, models are estimated that relate features of the built environment to variations in vehicle miles traveled per household and mode choice, mainly for non-work trips. Factor analysis is used to linearly combine variables into the density and design dimensions of the built environment. The research finds that density, land-use diversity, and pedestrian-oriented designs generally reduce trip rates and encourage nonauto travel in statistically significant ways, though their influences appear to be fairly marginal. Elasticities between variables and factors that capture the 3Ds and various measures of travel demand are generally in the 0.06 to 0.18 range, expressed in absolute terms. Compact development was found to exert the strongest influence on personal business trips. Within-neighborhood retail shops, on the other hand, were most strongly associated with mode choice for work trips. And while a factor capturing 'walking quality' was only moderately related to mode choice for non-work trips, those living in neighborhoods with grid-iron street designs and restricted commercial parking were nonetheless found to average significantly less vehicle miles of travel and rely less on single-occupant vehicles for non-work trips. Overall, this research shows that the elasticities between each dimension of the built environment and travel demand are modest to moderate, though certainly not inconsequential. Thus it supports the contention of new urbanists and others that creating more compact, diverse, and pedestrian-oriented neighborhoods, in combination, can meaningfully influence how Americans travel. © 1997 Elsevier Science Ltd


2001

Travel and the Built Environment

A Synthesis

Reid Ewing and Robert Cervero

The potential to moderate travel demand through changes in the built environment is the subject of more than 50 recent empirical studies. The majority of recent studies are summarized. Elasticities of travel demand with respect to density, diversity, design, and regional accessibility are then derived from selected studies. These elasticity values may be useful in travel forecasting and sketch planning and have already been incorporated into one sketch planning tool, the Environmental Protection Agency's Smart Growth Index model. In weighing the evidence, what can be said, with a degree of certainty, about the effects of built environments on key transportation "outcome" variables: trip frequency, trip length, mode choice, and composite measures of travel demand, vehicle miles traveled (VMT) and vehicle hours traveled (VHT)? Trip frequencies have attracted considerable academic interest of late. They appear to be primarily a function of socioeconomic characteristics of travelers and secondarily a function of the built environment. Trip lengths have received relatively little attention, which may account for the various degrees of importance attributed to the built environment in recent studies. Trip lengths are primarily a function of the built environment and secondarily a function of socioeconomic characteristics. Mode choices have received the most intensive study over the decades. Mode choices depend on both the built environment and socioeconomics (although they probably depend more on the latter). Studies of overall VMT or VHT find the built environment to be much more significant, a product of the differential trip lengths that factor into calculations of VMT and VHT.

WHY THIS SURVEY?

Every empirical study of land use–travel relationships begins with a review of the literature. At least two bibliographies cover the literature in annotated form (1, 2). Five extensive literature surveys are already available (3–7). The reader may wonder whether another literature survey can add much value.

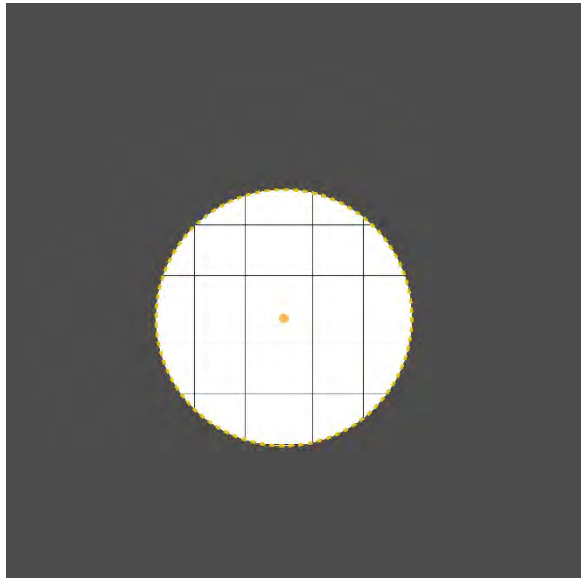
Existing surveys tend to zoom in on bottom-line results. They seldom tell exactly what was done in studies or how it was done, making it impossible to judge the validity and reliability of study results. Also, they seldom generalize across studies or make sense of differing results. Readers are left with glimpses of many trees rather than a panoramic view of this complex and rich forest of research.

This literature review generalizes across studies without glossing over real differences. It focuses on recent research for two reasons: the greater methodological sophistication and the greater variety of local land use, transportation, and site design variables tested. For early travel research, see the annotated bibliographies or earlier literature reviews.

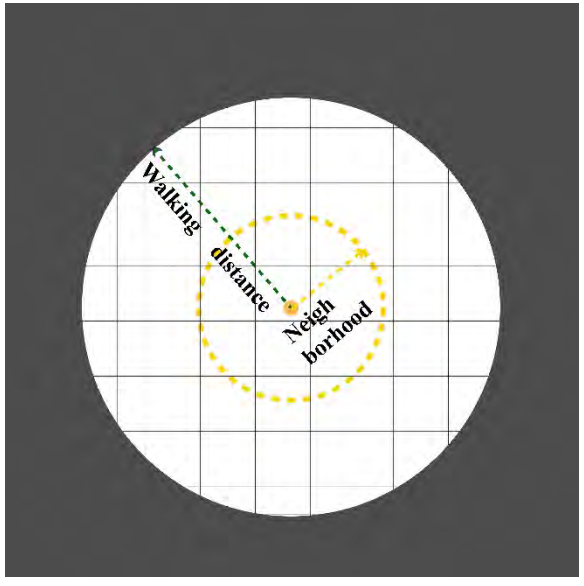
NATURE OF LITERATURE SURVEYED

The sections that follow review the existing literature for whatever lessons it may provide. The literature reviewed below is empirical rather than theoretical. Most studies start with decent-sized samples.

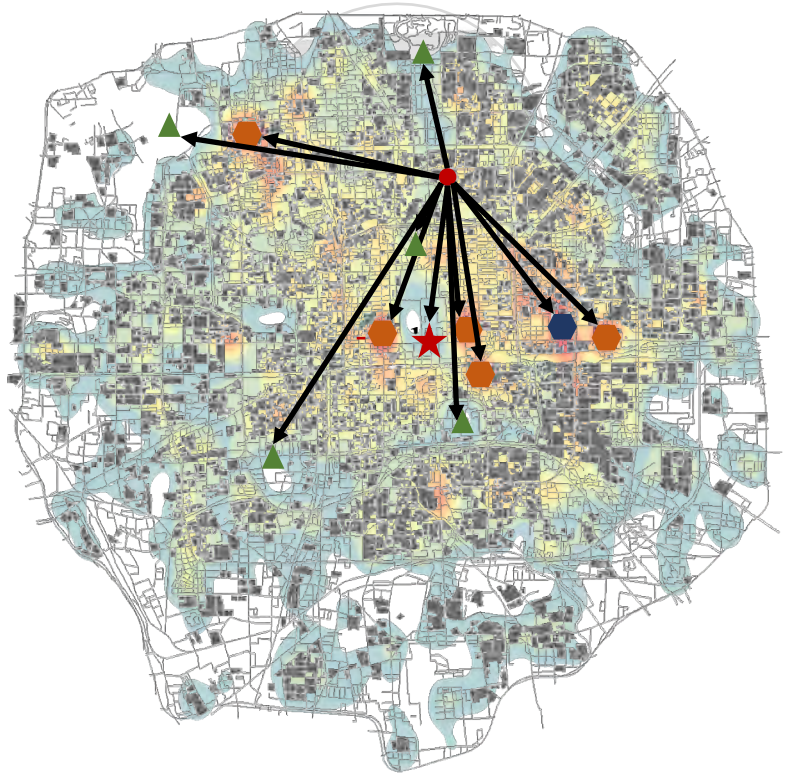
Scale – Neighborhood scale/ Around neighborhood scale/ City scale



The neighborhood scale



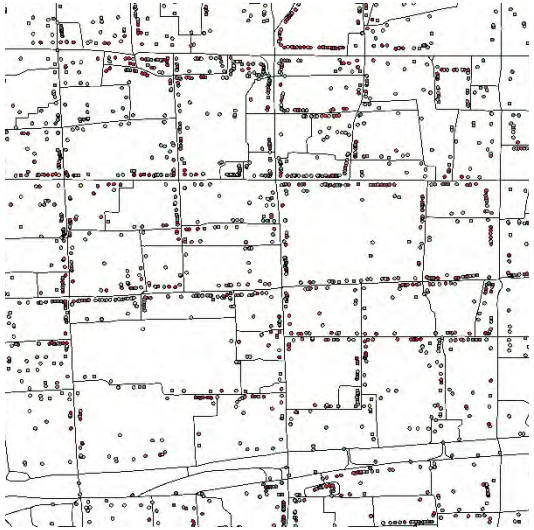
The scale of walking distance around neighborhood



The city scale

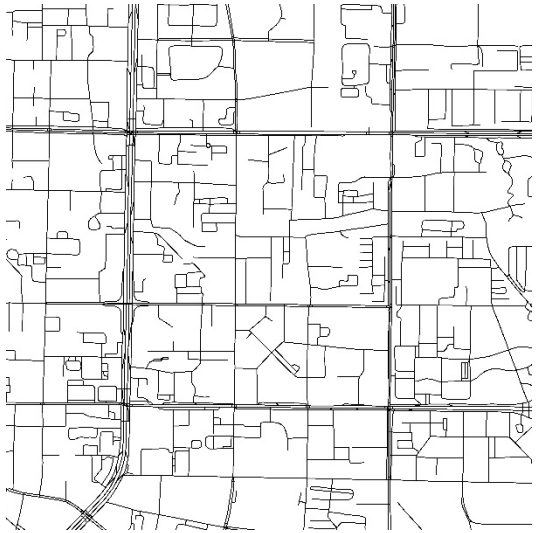
Scale	Description
The neighborhood scale	Measuring the items with large numbers, which could be related to the health, only within the neighborhood boundary.
The scale of walking distance around neighborhood (Simplified as around neighborhood scale below)	Measuring the items with large numbers, which could be related to the health, at the neighborhood and its surrounding area that within a walking distance from the centroid of the neighborhood
The city scale	Items with extremely small numbers at around neighborhood scale, which could be related to the health, should be measured at the city scale. Thus, the items must be searched at the city scale.

Data – Vector data (Point/Line/Polygon)



Point

POI data
(Data source: Google map/Yelp/Twitter/……)



Line

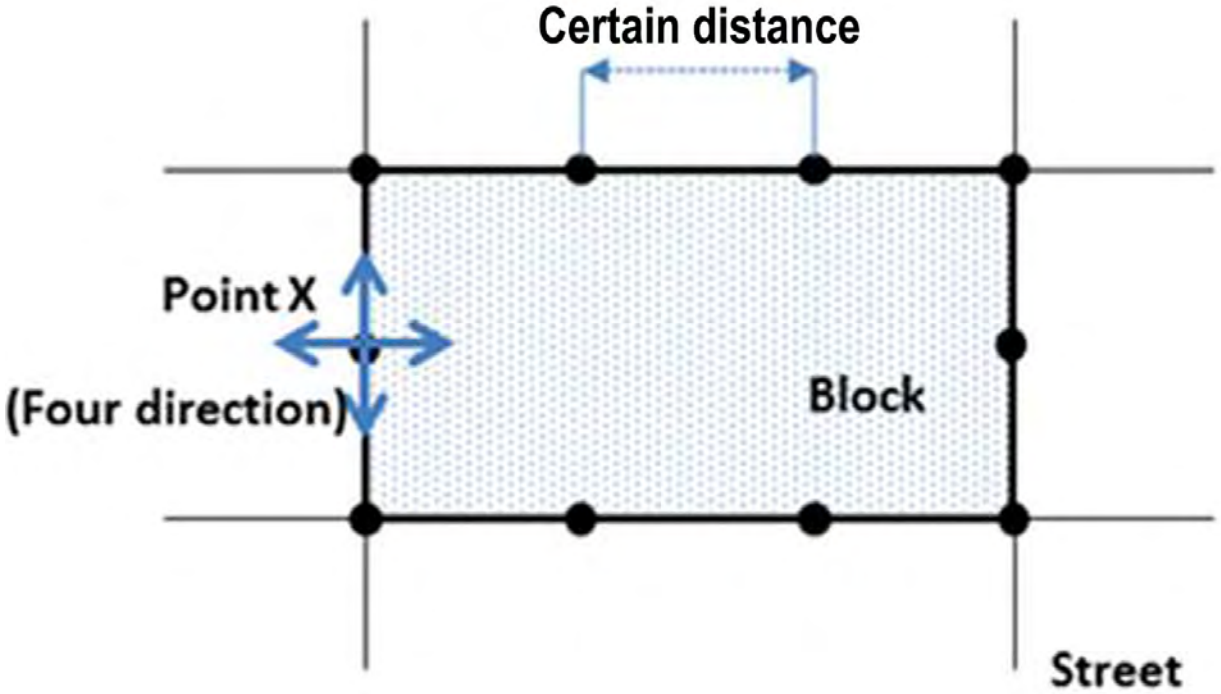
Road network data/……
(Data source: OpenStreetMap/……)

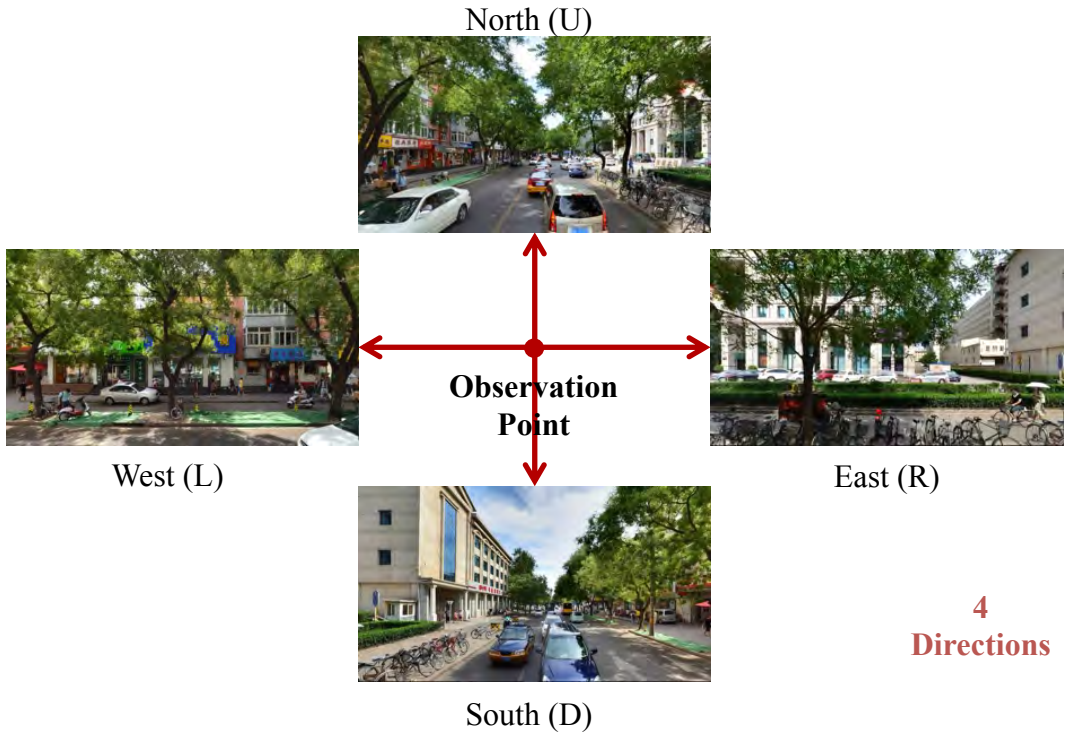
Polygon

Building data/Land-use data/……
(Data source: OpenStreetMap /……)

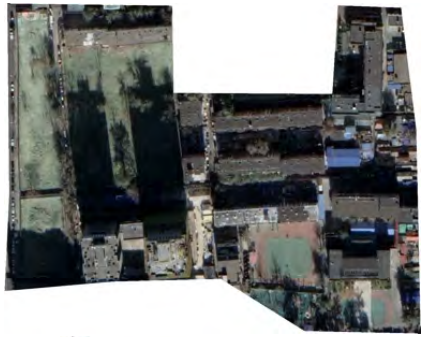
Data – Street view picture (SVP)

For each street, several vertices spaced a certain distance apart are distributed along the street, providing us with the 4-direction scenes for each vertex that may represent the overall spatial elements of a specific street.





Data – High-resolution remote sensing image



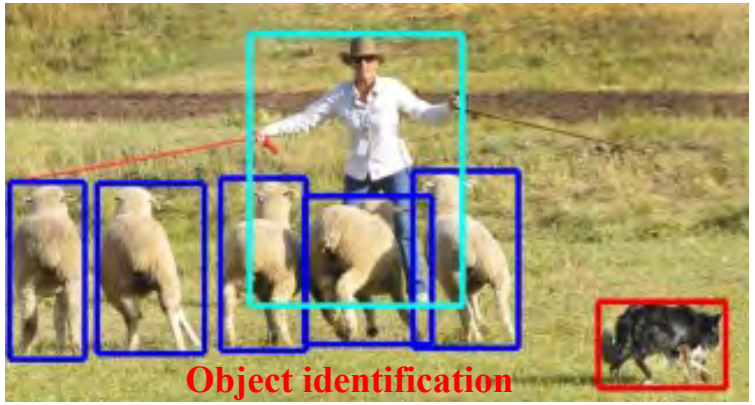
Tool – GIS software

A complete mapping and analytics platform for developers(not free)
https://developers.arcgis.com/

A free and open source geographic information system
https://www.qgis.org/en/site/

Tool – Analysis for SVP

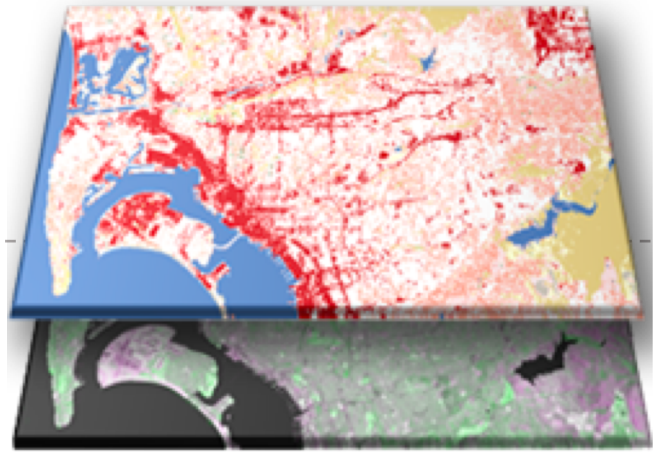
- Image classification
  - Using labels to distinguish different categories of objects
    - Manual image identification
    - Deep learning algorithm (AlexNet, GoogLeNet etc.)
- Object identification
  - Using rectangular frames to distinguish different categories of objects
    - Manual image identification
    - Deep learning algorithm (Faster R-CNN, YOLO etc.)
- Semantic segmentation
  - Using different colors to distinguish different categories of objects
    - Manual image identification Visual analysis
    - Deep learning algorithm (FCNN, SegNet etc.)



Tool – Analysis for remote sensing image (RSI)

Manual Audit

The original classification of remote sensing images was achieved through visual interpretation, mainly based on experts' experience and knowledge, to identify the types of features by interpreting the basic elements and specific interpretation marks.

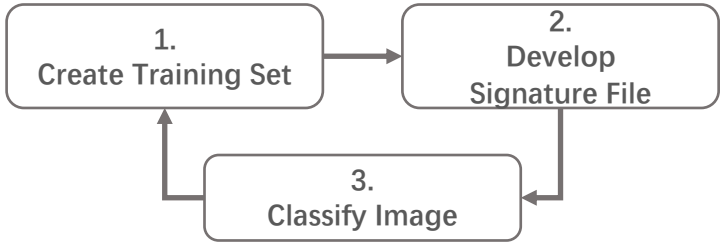


Automatic classification

It first groups image pixels into "clusters" based on their properties by using image clustering algorithms such as K-means. For the most part, they can use this list of free remote sensing software to create land cover maps.

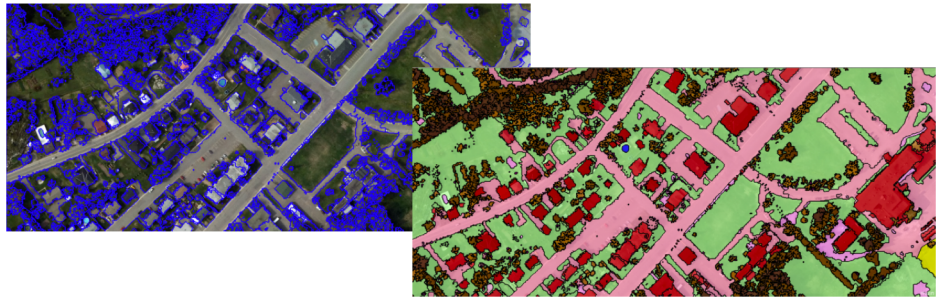
Supervised Classification

Supervised classifiers are widely used since they are more robust than model-based approaches (Niemeyer et al., 2014).These classifiers are able to learn the characteristics of target classes from training samples and to identify these learned characteristics in the unclassified data (Belgiu & Drăguţ, 2016).

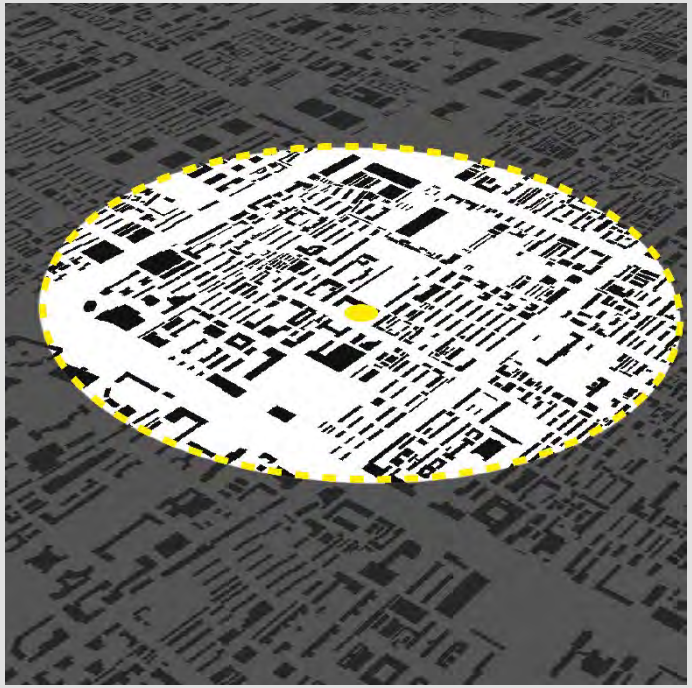


Object-Based / Object-Oriented Classification

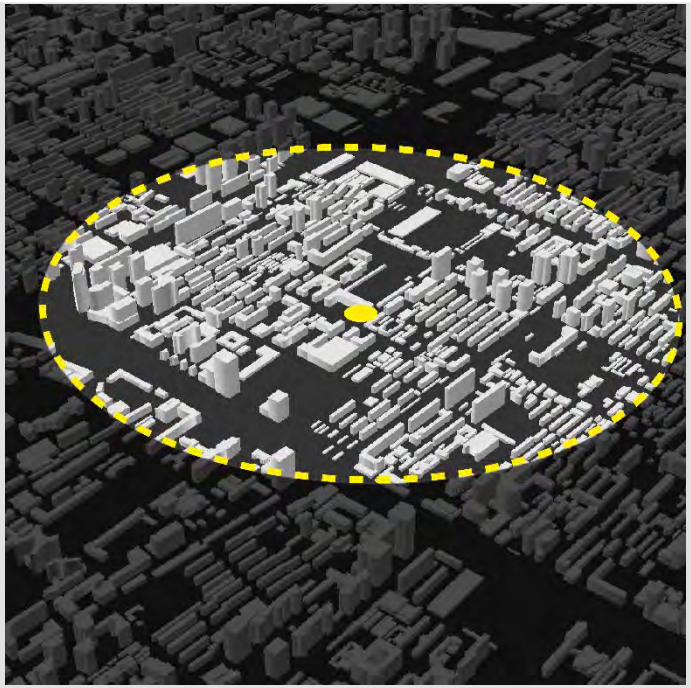
Supervised and unsupervised classification is pixel-based. But object-based image classification groups pixels into representative shapes and sizes. This process is multi-resolution segmentation or segment mean shift.



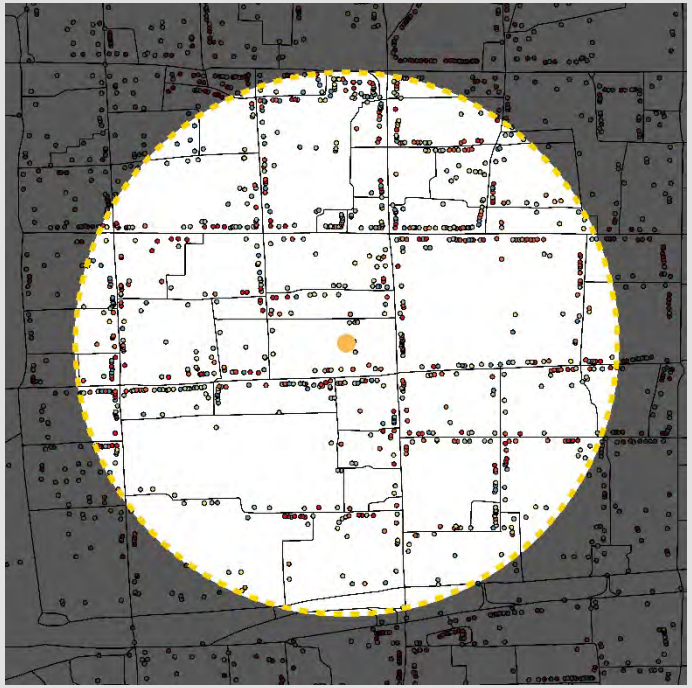
Density

Dimension	Indicator	Description	Example	Data	Tool
Density	Building density	The ratio of total building footprint area to the neighborhood area.		Building data with footprint area.	Spatial analysis tools in GIS software

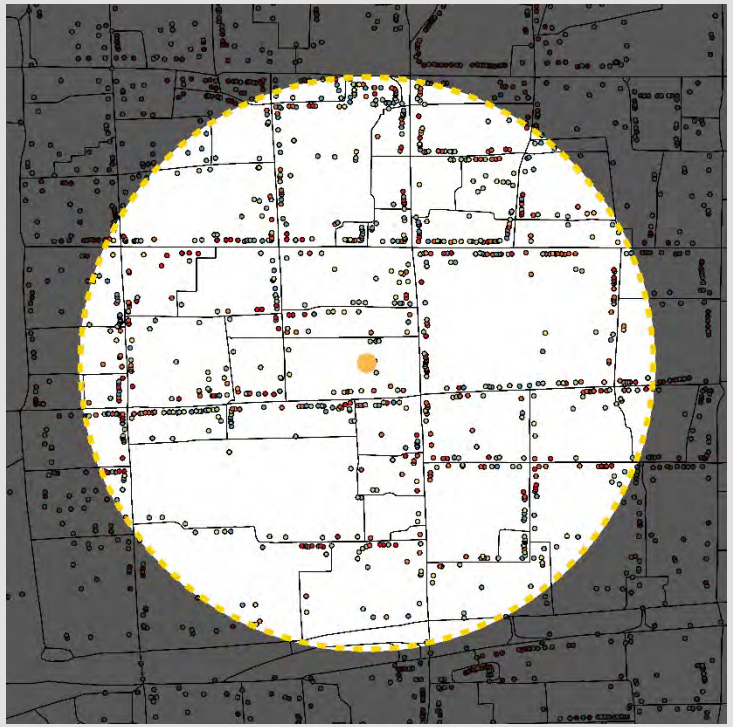
Density

Dimension	Indicator	Description	Example	Data	Tool
Density	Floor area ratio	The ratio of a building's total floor area (gross floor area) to the size of the piece of land upon which it is built.		Building data with footprint area and floor number.	Spatial analysis tools in GIS software

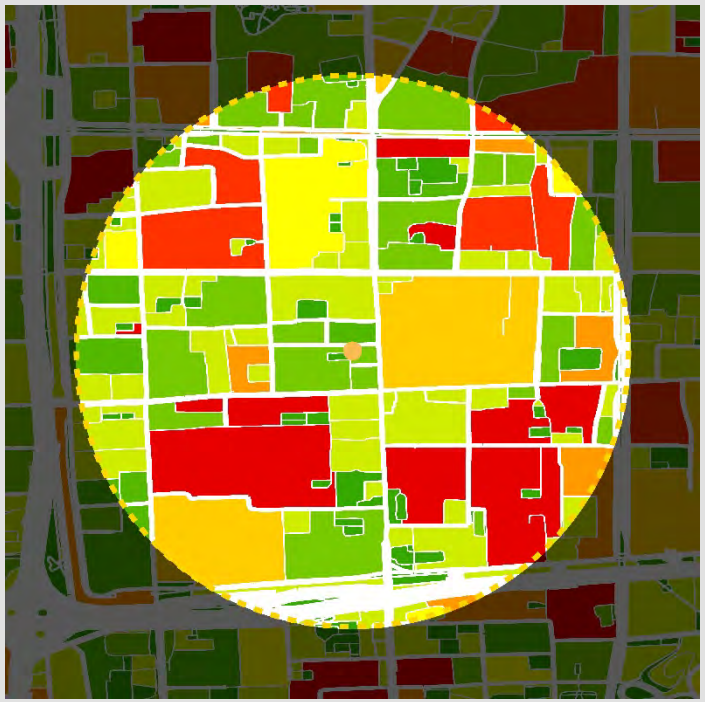
Density

Dimension	Indicator	Description	Example	Data	Tool
Density	Functional density	The total amount of the types of all facilities divided by the neighborhood area.		POI data	Spatial analysis tools in GIS software

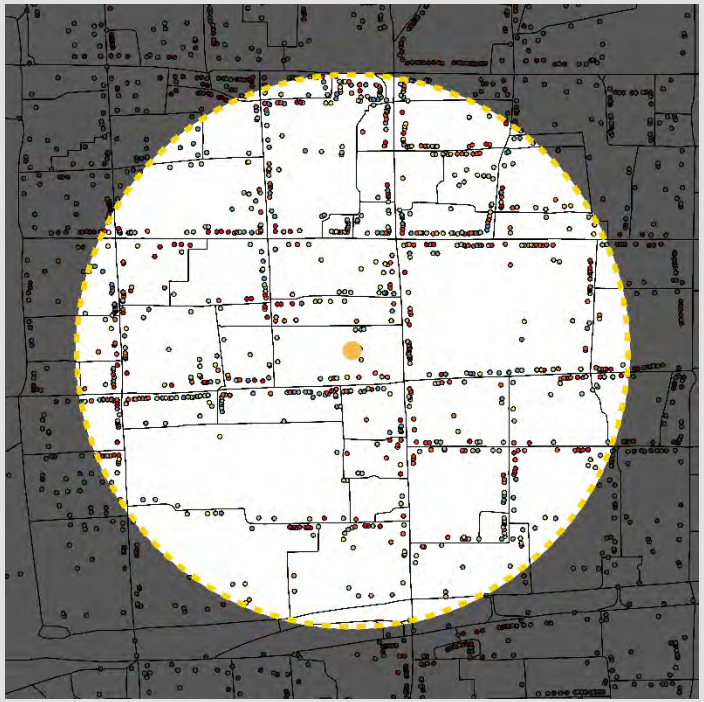
Density

Dimension	Indicator	Description	Example	Data	Tool
Density	Tobacco and alcohol retailer density Convenience store density Bus station density Fast food density Restaurant density Gym density Health related facility density(including pharmacy, clinic, etc)	The amount of the specific type of facilities divided by the neighborhood area.		POI data with the specific type attribute	Spatial analysis tools in GIS software

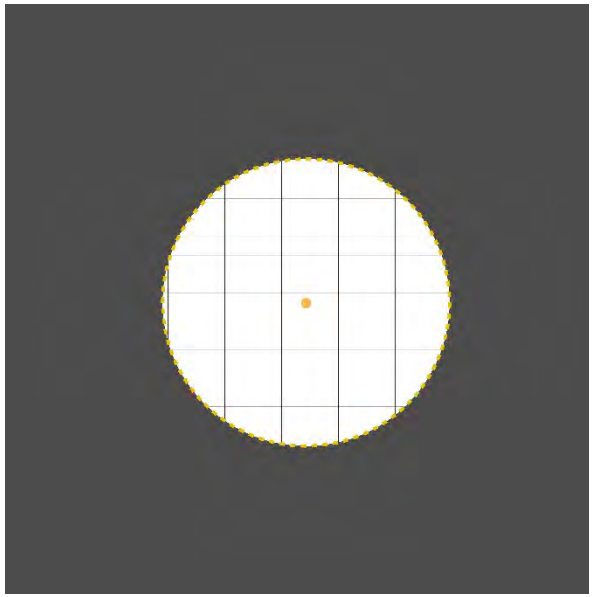
Diversity

Dimension	Indicator	Description	Example	Data	Tool
Diversity	Land-use diversity(Building or Lot level)	Diversity = $-\sum (P_i * \ln P_i)$; where n denotes the number of land use types, and P_i is the proportion of land use type i among all land uses within the neighborhood.		Land-use data/ Building data with the type of use	Spatial analysis tools in GIS software

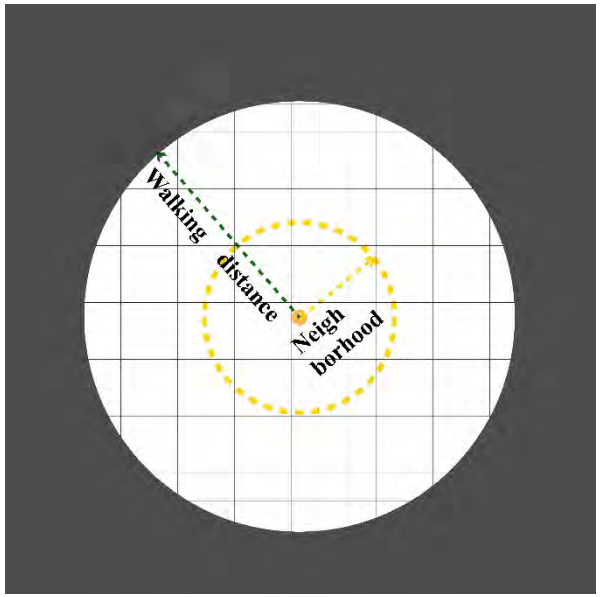
Diversity

Dimension	Indicator	Description	Example	Data	Tool
Diversity	Functional diversity	Functional diversity $= -\sum (P_i * \ln P_i)$; where n denotes the number of types, and P_i is the proportion of facility type i among all POIs within the neighborhood.		POI data with the type attribute	Spatial analysis tools in GIS software

Design



The neighborhood scale



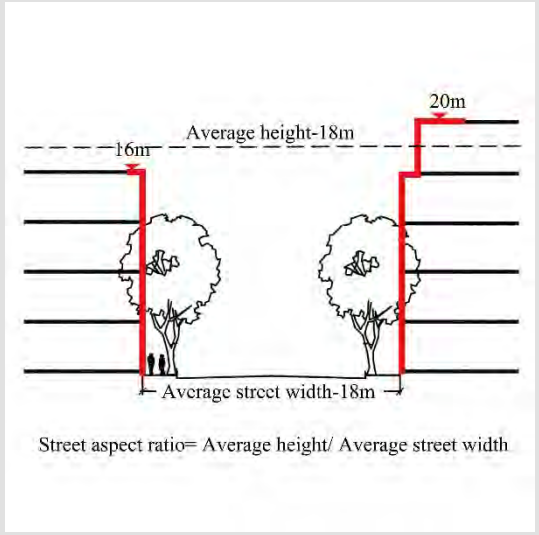
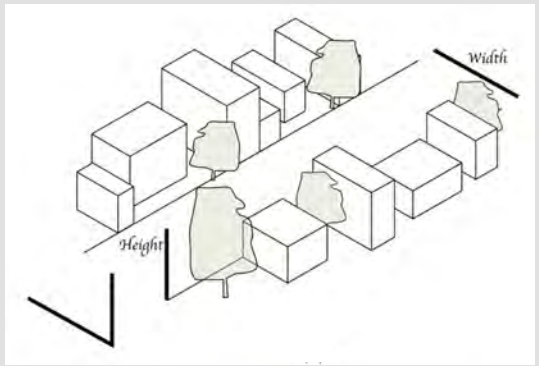
The scale of walking distance around neighborhood (around neighborhood scale)

We study the design dimension at both neighborhood scale and around neighborhood scale, thus every indicator in design dimension would be divided into two indicators, which are corresponding to their scale.

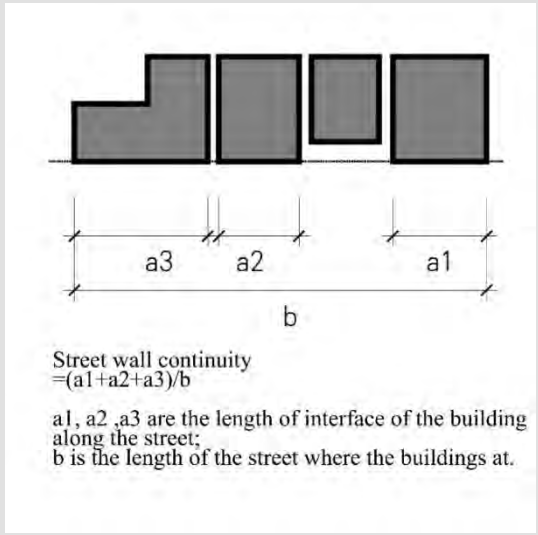
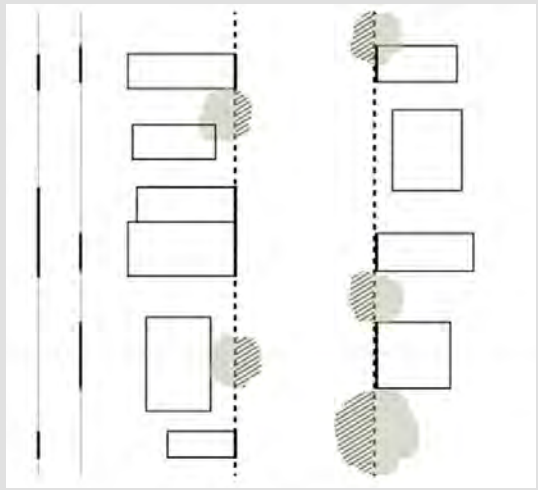
Design

Dimension	Indicator	Description	Example	Data	Tool
Design	Spatial quality (neighborhood scale) Spatial quality (around neighborhood scale)	Step1: Evaluating the spatial quality through the indicator obtained by panel auditing system, a platform for people to manually grade the degree of spatial disorder. Step2: Calculating the mean value of four directions as the value for that point. Step3: Summing up the value of the whole points at neighborhood scale and around neighborhood scale.		Street view picture	Spatial analysis tools in GIS software /SVP analysis tool

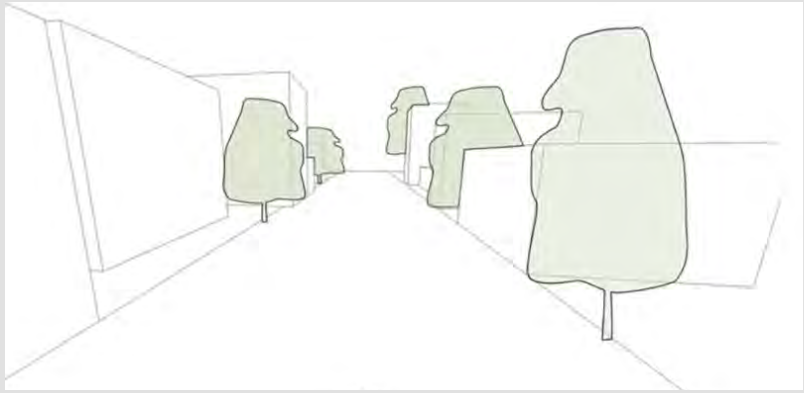
Design

Dimension	Indicator	Description	Example	Data	Tool
Design	Cross-sectional proportion(neighborhood scale)	Definition: The ratio of average height to street width, which could be calculated directly for both sides. Step1: Methods are borrowed from Harvey (2014) to calculate cross-sectional proportion. Step2: Summing up the value of the whole points within the both scales.	 	Street view picture	Spatial analysis tools in GIS software
	Cross-sectional proportion(around neighborhood scale)				

Design

Dimension	Indicator	Description	Example	Data	Tool
Design	Street wall continuity (neighborhood scale) Street wall continuity (around neighborhood scale)	Definition: The proportion of street edge intersecting with buildings. Step1: Methods are borrowed from Harvey (2014) to calculate Street wall continuity. Step2: Calculating the mean value of both sides as the value for that point. Step3: Summing up the value of the whole points within the both scales.	 	Street view picture	Spatial analysis tools in GIS software

Design

Dimension	Indicator	Description	Example	Data	Tool
Design	Greenery (neighborhood scale) Greenery (around neighborhood scale)	Definition: The percentage of trees in the picture is defined as greenery. Step 1: Calculating the proportion of trees in the pictures. Step2: Calculating the mean value of four directions as the value for that point. Step3: Summing up the value of the whole points within the both scales.		Street view picture	Spatial analysis tools in GIS software /SVP analysis tool

Design

Dimension	Indicator	Description	Example	Data	Tool
Design	Tree (neighborhood scale) Tree (around neighborhood scale)	Step1: Extracting the trees from high resolution remote imagery. Step2: The trees measured under neighborhood scale and around neighborhood scale divided by neighborhood area and around neighborhood area.		High resolution remote imagery	Spatial analysis tools in GIS software

Design

Dimension	Indicator	Description	Example	Data	Tool
Design	Green space (neighborhood scale) Green space (around neighborhood scale)	Step1: Extracting the green land from the land-use data. Step2: The area of the green land measured at neighborhood scale and around neighborhood scale divided by neighborhood area and around neighborhood area.		Land-use data	Spatial analysis tools in GIS software

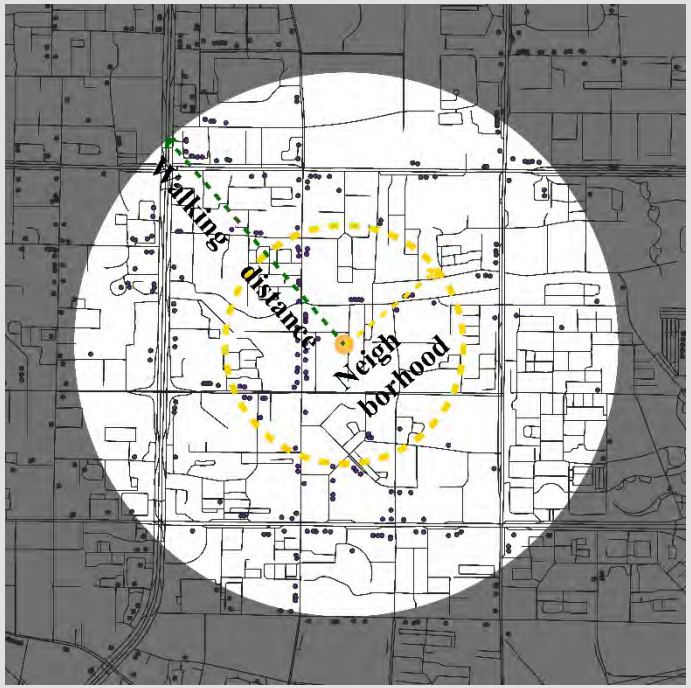
Design

Dimension	Indicator	Description	Example	Data	Tool
Design	Fast food/Tobacco /alcohol advertisement density (neighborhood scale) Fast food/Tobacco /alcohol advertisement density(around neighborhood scale)	Step1: Extracting the specific advertisement from the street view pictures. Step2: The appearance number of the specific advertisement divided by neighborhood area and around neighborhood area.		Street view picture	Spatial analysis tools in GIS software /SVP analysis tool

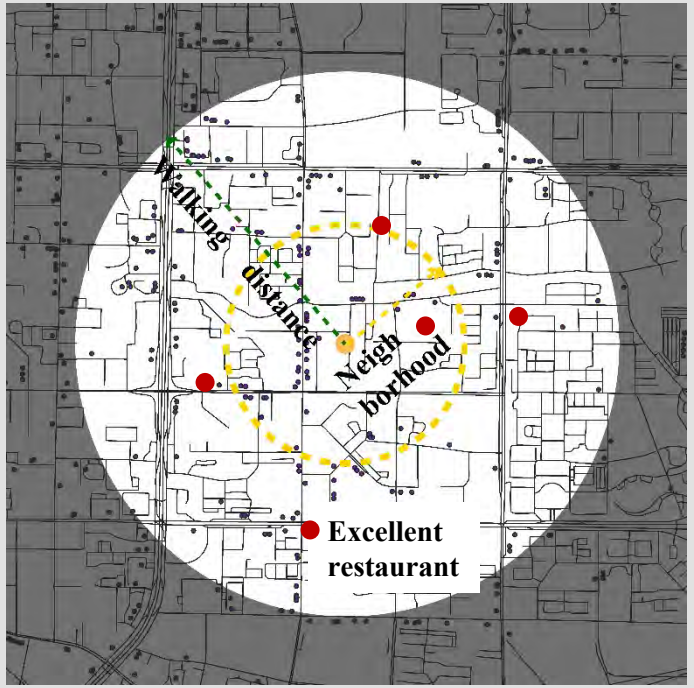
Design

Dimension	Indicator	Description	Example	Data	Tool
Design	Busy traffic road density (neighborhood scale) Busy traffic road density (around neighborhood scale)	Step1: Extracting the busy traffic road from the street view pictures. Step2: The appearance number of the busy traffic roads divided by neighborhood area and around neighborhood area.		Street view picture	Spatial analysis tools in GIS software /SVP analysis tool

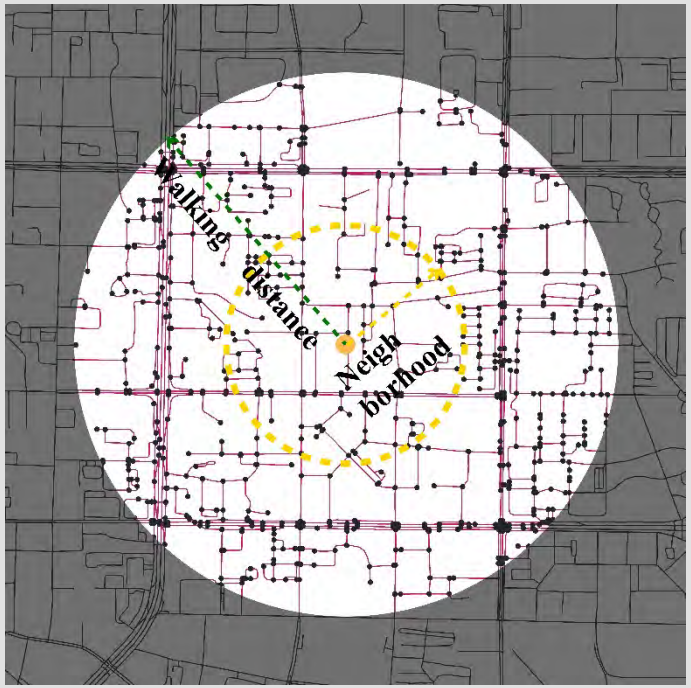
Destination Accessibility

Dimension	Indicator	Description	Example	Data	Tool
Destination Accessibility	Fast food density Gym density Restaurant density Tobacco and alcohol retailer density Shopping mall density Bus station density	Total amount of the specific facilities divided by the area of around neighborhood scale.		POI data with the facility type	Spatial analysis tools in GIS software

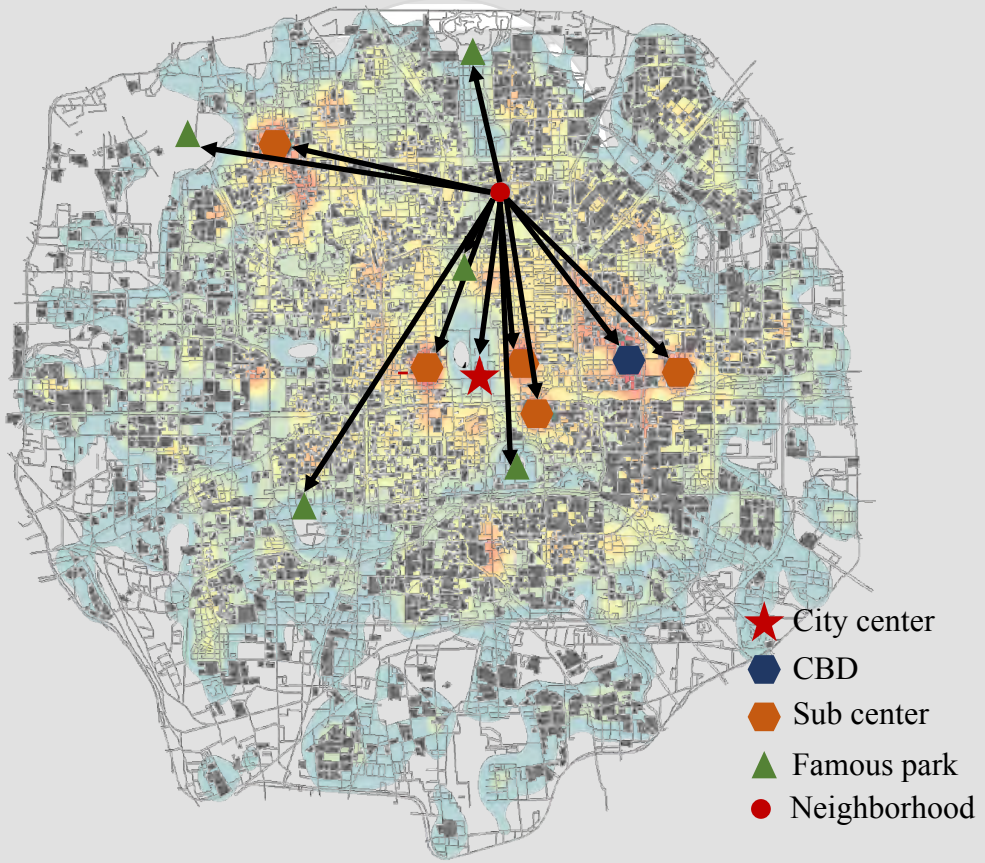
Destination Accessibility

Dimension	Indicator	Description	Example	Data	Tool
Destination Accessibility	Excellent restaurant proportion	The good/excellent restaurants divided by all the restaurants within the around neighborhood area.		POI data with the rate of the restaurant.	Spatial analysis tools in GIS software

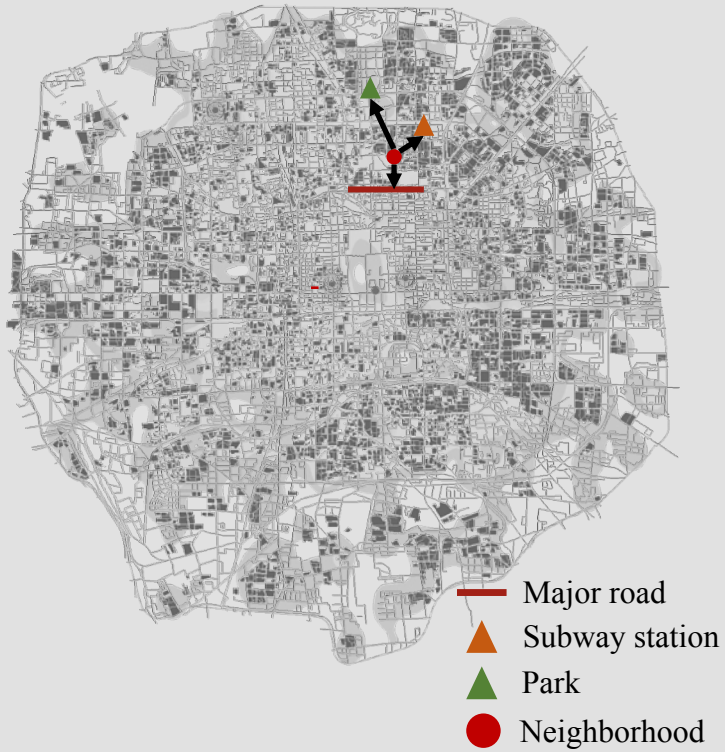
Destination Accessibility

Dimension	Indicator	Description	Example	Data	Tool
Destination Accessibility	Street intersection density	Total amount of the street intersections divided by the area of around neighborhood scale.		Road network data	Spatial analysis tools in GIS software

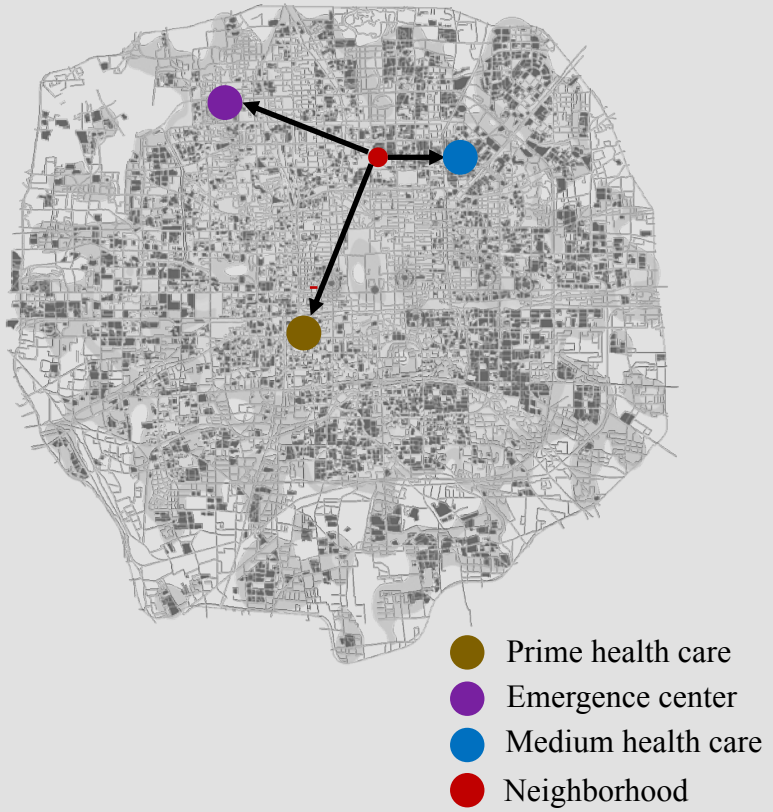
Distance

Dimension	Indicator	Description	Example	Data	Tool
Distance	Distance to city center	Calculating Euclidean distance from the centroid of neighborhood to the city center.		Location of the city center	The Point distance tool in GIS software
	Distance to CBD	Calculating Euclidean distance from the centroid of neighborhood to the CBD.		Location of the CBD	
	Average distance to city subcenter(s)	Calculating average Euclidean distance from the centroid of neighborhood to the city subcenter(s).		Location of the city subcenter(s)	
	Average distance to famous park(s)	Calculating average Euclidean distance from the centroid of neighborhood to the famous park(s).		Location of the famous park(s)	

Distance

Dimension	Indicator	Description	Example	Data	Tool
Distance	Distance to the nearest subway station	Calculating Euclidean distance from the centroid of neighborhood to the nearest subway station.		POI data with the type of the subway station	The Point distance tool in GIS software
	Distance to the nearest park	Calculating Euclidean distance from the centroid of neighborhood to the nearest park.		POI data with the type of the park	
	Distance to the major road	Calculating Euclidean distance from the centroid of neighborhood to the nearest major road.		Road network data with the type of the road level	

Distance

Dimension	Indicator	Description	Example	Data	Tool
Distance	Distance to the nearest prime health care	Calculating Euclidean distance from the centroid of neighborhood to the nearest prime health care .		Location of the prime health care	The Point distance tool in GIS software
	Distance to the nearest emergence center	Calculating Euclidean distance from the centroid of neighborhood to the nearest emergence center.		Location of the emergency center	
	Distance to the nearest medium health care	Calculating Euclidean distance from the centroid of neighborhood to the nearest medium health .		Location of the medium health care	

2. Partial Evidence for The Relationship Between Neighborhood Built Environment and Health Outcome

In progress now

Tsinghua University

Theme	Health Risk Factor/Outcome	Location	Author/Year	Result
High building floor area ratio	Mental health	Turin (Northwest Italy)	Melis et al. 2015	+++++High for improving the mental health for people after age 50.
Stuctured and high building-density	Obesity	Ouagadougou (Burkina Faso)	Oue´draogo et al. 2008	++++Medium for reducing greater obesity odds.
High land-use diversity	Metabolic syndrome	Australia	Baldock et al. 2012	+++Medium for reducing the risk of Metabolic syndrome.
	Motor vehicle fatalities	USA	Braun et al. 2015	+++++High for decreasing the motor vehicle fatalities.
	Obesity	USA	Mobley et al. 2006	+++++High for women to have lower BMI.
High intersection density	Obesity	Mexico	Zhang et al. 2019	+++++High for higher BMI index.
Short distance to the nearest park	Obesity	Mexico	Zhang et al. 2019	+++Medium for higher BMI index.
Most distance to the nearest green space	CVD	Canada	Ngom et al. 2016	++++Medium to high for a higher prevalence rate of CVD.
	Color trails test(CTT)	Europe	Zijlema et al. 2017	++Low to medium(Each 100 m increase in residential distance to natural outdoor environment was associated with a longer CTT completion time of 1.50% (95% CI 0.13, 2.89).)

Theme	Health Risk Factor/Outcome	Location	Author/ Year	Result
More green space	Subjective general health	Spain	Dadvand et al. 2016	++++Medium to high for improving the general health.
	Blood pressure	Belgium	Bijnens et al. 2017	+++Medium for lowing the blood pressure on people aged 18-25 years.
	Myocardial infarction	Israel	Yitshak-Sade et al. 2017	+++++High for reducing the prevalence of myocardial infarction.
	Depressive symptoms	Bradford (UK)	McEachan et al. 2016	+++++High (Pregnant women in the greener quintiles were 18–23% less likely to report depressive symptoms than those in the least green quintile (for within 100 m of green space buffer zone).)
	Hyperlipidemia	Korea	Kim et al. 2016	+++++High for decreasing hyperlipidemia risk.
Short distance to parks and Green areas	Depression	South Korea	Kim et al. 2017	+++Medium for reducing the depression.

Theme	Health Risk Factor/Outcome	Location	Author/ Year	Result
More fast food accessibility	Mortality	USA	Ahern et al. 2011	++Low to medium for higher mortality rates.
More full service restaurants accessibility				+++Medium for lower mortality rates.
More grocery stores accessibility				+++++High for lower mortality rates.
More convenience stores accessibility				+++Medium for higher mortality rates.
More fast food accessibility	Diabetes			++Low to medium for higher diabetes odds.
More full service restaurants accessibility				+Low for lower diabetes odds.
More grocery stores accessibility				++++Medium to high for lower diabetes odds.
More convenience stores accessibility				+++Medium for higher diabetes odds.
More full service restaurants accessibility	Obesity			+++++High for greater obesity rates.
More grocery stores accessibility				+++++High for greater obesity rates.
More convenience stores accessibility				+++Medium for greater obesity rates.

Theme	Health Risk Factor/Outcome	Location	Author/ Year	Result
High convenience store density	Type II diabetes mellitus	South Carolina counties	AlHasan & Eberth. 2016	+++Medium for high prevalence of type II diabetes.
Short distance to urban major road	CHD	USA	Kan et al. 2008	++++Medium to high for residents to have CHD.
	Coronary artery calcification(CAC)	Germany	Dragano et al. 2009	++++Medium to high for participants to have highest levels of CAC
More fast food density	Type II diabetes mellitus	South Carolina counties	AlHasan & Eberth. 2016	+++Medium for low prevalence of type II diabetes.
	Obesity	USA	Inagami et al. 2009	+++++High for local residents who do not have access to cars to have higher BMI.
	Stroke	Sweden	Hamano et al. 2013	+++Medium for high prevalence of stroke.
Long distance to prime health care	Breast cancer	USA	Wang et al. 2012	+Low for increasing the risk of late-stage breast cancer.

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Thanks and welcome any comment/question

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