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Introduction

Liveability is a complex multifaceted concept that routinely measures macro-level features (income, employment, infrastructure, inequalities etc.) at the level of the city or municipality to inform investment, policy-making and the determination of area/city development. Whilst such high-level assessments are required, they prevent detail being gathered at lower geographical scales (street, neighbourhood etc.) and relating to micro-level features (roads (cycle lanes, crossings), open/green space, amenities), which not only have the potential to impact health and well-being but also to promote activity-friendly communities and active living. Consequently, if liveability can be measured on a local scale with micro-level outcomes this has the potential to further active living research, policy and practice by identifying modifiable features to cost-effectively produce public health returns and to create and sustain active living. One tool which has the potential to operate on a localized scale and to gather information at the micro-level is Microscale Audit of Pedestrian Streetscapes (MAPS) Full.

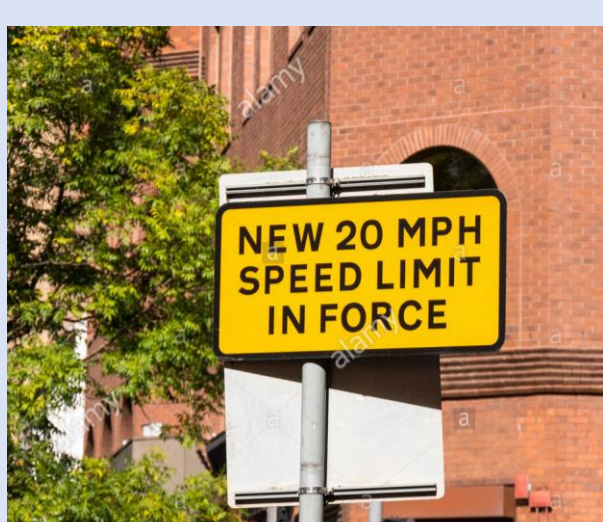
Objectives

The current study aimed to: 1) adapt; and 2) test the reliability and responsiveness of MAPS-Liveability to assess liveability and active living.



Methods

A review of the literature was undertaken to adapt the tool to incorporate all elements of liveability; 2) MAPS-Liveability piloting to determine any protocol adaptations; 3) establishing a scoring system for MAPS-Liveability; and 4) implementation and reliability and responsiveness testing of MAPS-Liveability via Google streetview pre and post-implementation of an intervention to restrict speed limits to 20mph/30kmph within Belfast city centre (legislation and signage).



Results

1) Nine sub-characteristics of liveability were established with attributes (Table 1). MAPS-Full incorporated the majority of sub-characteristic attributes with only minimal amendments required (Table 1). Twelve behavioural outcomes of active living were also added (e.g. number of cyclists, pedestrians, bicycle racks and bicycles in the rack).

2) Liveability is a broad and complex concept, that cannot be gauged by assessing 0.25 miles of a route. Streets can change dramatically from end to end, for this reason, MAPS-Liveability assesses the entirety of the street from beginning to end as opposed to 0.25 miles of the route

Table 1.	Microscale Audit of Pedestrian Streetscapes (MAPS) Full	
	Sub-characteristic attributes included within MAPS-Full	Sub-characteristic attributes to be added to MAPS-Full
SAFETY	Neighbourhood watch, Anti-social behaviour, Graffiti, Abandoned cars, Presence of large groups, Vandalism, Presence of people	Safety/panic buttons
HEALTH	Pharmacy, Health centre/professionals, Cycle lanes, Alcohol outlets, Exercise amenities	Walking trails, Bicycle tracks, Individuals cycling, Individuals performing other physical activity or exercise, Smoking areas, Pollution, Pleasantness
SUSTAINABILITY	Clean, Litter, Graffiti/Vandalism, Public transport, Green space/Open space, Landscaping, Benches	Car charging points
INCLUSIVITY	Mix of residential and non-residential, Residential houses, Places of work, Commercial, Education, Places of worship, Senior centres	
PLACES	Shops, Restaurants, Culture, Retail, Post offices, Car parks, Bank, Supermarkets, Entertainment, Park, Leisure facilities, Green/open space, Other services	
EDUCATION	Schools (pre-, primary, secondary), Colleges, Universities	
TRAFFIC TRANSPORT PAVEMENTS	Speed signs, Speed calming measures	Presence of cars
ROADS	Quality, Size, Buffers, Slope, Lights, Crossings	
	Public transport stops, Crossings, Street amenities	Rapid transport

3) In addition to the original scoring protocol a new liveability scoring protocol was developed to enable: each of the nine sub-characteristic liveability scores to be calculated (Table 1), the overall liveability score (out of a total of 178) and to produce the twelve behavioural outcome counts.

4) Between auditors (pre and post), intra-class correlation coefficients (ICC) showed that the total liveability score was good-excellent (ICC .891-.931), for the nine sub-characteristics of liveability eight were moderate-good (ICC .571-.874) with only safety being found to be poor (ICC .419-.493) and for the twelve behavioural outcomes number of: bicycle racks, bicycles the rack can hold, bicycles in the racks, cyclists, moving cars, parked cars, total cars (moving/parked) and pedestrians were all found to be moderate to excellent (ICC .541-.912). In addition, both auditors found changes pre- to post-intervention with the largest changes related to traffic (expected).



April 2015 (pre-)

May 2019 (post-)

Pre to post-intervention Google street view shows the inclusion of 20mph signage, dedicated bus lanes with painted road lines, increased number of pedestrians, decreased number of cars driving and a decreased number of parking spaces which have now been changed to loading bays.

Conclusions

MAPS-Liveability provides researchers, policy makers and practitioners with a moderate to excellent method of assessing liveability and active living at lower geographical scales and assessing micro-level features. MAPS-Liveability can provide evidence and recommendations for cost-effective modifications to improve liveability, active living and public health.