

**Paper:** Development of a comprehensive tool for auditing characteristics of the built environment relevant to physical activity

**Sources:** Day K, Boarnet M, Alfonzo M, Forsyth A, et al. The Irvine-Minnesota Inventory to Measure Built Environments: development. *American Journal of Preventive Medicine* 2006; 30: 144-152.

Boarnet MG, Day K, Alfonzo M, et al. The Irvine-Minnesota Inventory to Measure Built Environments: reliability tests. *American Journal of Preventive Medicine* 2006; 30: 153-9.

Recent consultations concerning the technical support that the NSW Centre for Physical Activity and Health could usefully provide to practitioners, revealed that there is a need for tools to assess the level of support offered in different local environments for physical activity. Potential uses of these tools are to identify areas in need of change, to equip planning partners in local government, and to evaluate interventions addressing the physical environment.

While a number of environmental audit tools have been developed, the Irvine-Minnesota Inventory to Measure Built Environments is the most recent and comprehensive. The developers intended this tool to be an advance on existing audit instruments. Compared with the systematic pedestrian and cycling environmental scan (SPACES) developed by Pikora and colleagues in Western Australia, it includes more detailed measures of street type, building type, architecture and land use. In comparison with another extensive tool developed in St Louis, Missouri, by Brownson and colleagues, it offers more detailed measures of architectural characteristics and the aesthetic and comfort features in the environment.

A systematic process was undertaken in the development of the Irvine-Minnesota Inventory tool: a review of seven existing audit tools; focus groups with different populations who might be overlooked in active living research (e.g., adolescents, minorities, low-income people); a field study in 27 locations to identify additional aspects of the physical environment that could be relevant to active living; consultation with an expert panel, and; piloting in two settings.

The final inventory contains 162 items, in four domains: accessibility (62 items), pleasurability (56 items), perceived safety from traffic (31 items), and perceived safety from crime (15 items). An additional five features which can be measured using GIS (e.g. block length, street width) can be recorded on the inventory. It can be used in a pen and paper format or in Microsoft Access format on a tablet PC. The developers recommend that a team of two observers use the inventory across settings, which should be roughly the size of residential neighbourhoods or commercial districts. Within settings the recommended unit of observation is segments, which are the equivalent of the single side of two street blocks. Alternative methods of selecting segments for observation are identified, namely simple random sampling, or adaptive sampling, where the observers only assess segments that differ from the previous one in type of land use, presence of footpaths, presence of barriers to movement or aesthetic characteristics.

A study testing the inter-rater reliability of the inventory is reported, which was conducted in a diverse range of urban settings in California and Minnesota, including a total sample of almost 300 segments. In California about 77% of the items were found to have >80% total agreement across three raters, while in Minnesota 99% of the items had >80% agreement among two raters. The greater agreement in Minnesota compared with California is due to the fact that more extensive training of raters was provided in the former location, whereas in California the intention was to provide the level of training that might be available in future applications of the inventory. The time required for data collection was found to be 10-20 minutes per segment.

The utility of the Irvine-Minnesota Inventory to Measure Built Environments for Australian contexts needs to be evaluated by individual researchers and practitioners. Its strengths are that it has been carefully developed, provides a comprehensive assessment of environmental characteristics, and can be used in pen and paper or software versions. Its lengthy and

comprehensive nature may increase its perceived value to local planners, but may be a deterrent to some. The inventory is designed primarily to advance research about the relationship between physical activity and the environment, and it does not appear to have been reviewed by those who could apply it in local planning projects. The developers note that the inventory does lack some of the measures included in other tools (e.g., SPACES) such as width of footpaths, footpath material, and the distance between footpaths and curb. It also lacks some of the detail collected in audit tools concerned with the examination of parks and playgrounds. Given that its evaluation has been in urban settings, its application in rural locations may be limited.

The Irvine-Minnesota Inventory to Measure Built Environments is an advance in the measurement of physical environments for activity, and it certainly deserves careful review by practitioners and researchers with an interest in this area. If not used in its entirety, there certainly may be sections of the inventory that could have useful applications.

