Sustainable Urban Form: The modern structure of walkable cities

Report on lecture delivered by Michael Mehaffy
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Michael Mehaffy delivered the Sir David Anderson Award Lecture at the University of Strathclyde on the topic of ‘Sustainable Urban Form: The Modern Structure of Walkable Cities’. An introductory presentation on ‘Sustainable Glasgow’ shared overall themes relevant to the lecture:

- Sustainable placemaking issues are complex, multiple and intertwined – there is no one answer; a combination of economic, ecological, social and physical strategies are required
- Issues of sustainability are concerned with people outcomes, and making better places to live
- A low carbon future is reliant upon changes in human attitudes and behaviours

The main lecture focussed on the positive effects that sustainable urban form can contribute to the consumption and conservation of energy, and how it can enable citizens to enjoy more sustainable lifestyles based on a straightforward, common-sense concept of walkability.

Challenging old thinking

Having described that the challenges of the future will largely play out in cities, Mehaffy went on to question major influences on city design on the basis that theories and assumptions which promoted functional, high-mobility places, according to modernising machine-age thinking have resulted in unsustainable urban forms. Examples of such theories included Howard’s Garden City, which segregated land uses and de-populated cities; Le Corbusier’s Radiant City which functioned at a machine rather than human scale, and which set out to “kill the street”; and superblock schemes of ‘Neighbourhood Units’, such as the 1929 Clarence Perry model.

Tackling a sustainable future will require “all of us ... to change our ways of living and consuming and ... the organisation of our cities”. Instead of failed ‘self-justifying’ models, or inserting “ready-made fragments of self-contained urbanism” (e.g. neighbourhood units, superblocks or super-deep-plan-buildings with internal mixed use), Mehaffy urged an evidence based approach to urban design derived from lessons from cities that are demonstrating encouraging sustainable features; a message reinforced by Jane Jacobs’s work in The Death and Life of Great American Cities.

Mobility paradox

Jacobs’ suggestion that those places which decline the most tend to be the most disconnected from the processes of human activity and economic vitality was supported by Mehaffy who spoke of the paradox of ‘induced demand’ where the more we build for mobility, the more it is lost; where walkability and connectivity suffer in favour of vehicle movement.
The damaging social and economic consequences of unsustainable urban form were set in a contemporary context by data which indicates that the global financial crisis was precipitated by house foreclosures in far-flung, auto-dependent suburbs. Evidence therefore suggests that the urgent need for urban designers is to work to remove barriers that isolate and deprive people of physical movement and inhibit their ability to interact. The dual issues of scale and connectivity are fundamental considerations in this.

Urban form influences consumption patterns in different ways. By virtue of scale, denser forms of development require shorter infrastructure, reduced travel distances use less energy, and movement is more efficient. Environments which are walkable also permit a menu of choice, or “choice architecture”; i.e. do we walk, drive or catch public transport? Are there opportunities for social interaction along the way that may support local shops and facilities; or are we obliged to drive elsewhere for our basic needs? Mehaffy advocated that “choice architecture” is a key dimension of urban design for a sustainable future.

The need for relationships in the sustainable city

Jane Jacobs recognised that poor physical arrangements could disrupt critical relationships between parts of the city, with devastating results. When connectivity is lost the greater network connectivity of a wider area is affected, and when the scale is not optimised between vehicular and pedestrian systems then things go wrong within the city. There is a detrimental effect on public transport if the ability to walk is compromised. The “movement economy” suffers; people are unable to walk to local businesses, meet each other on the street, energise public space, or build social capital. Additionally, walkability problems tend to foster car dependency which, in turn, isolates those who can’t drive, and so lead to social fragmentation. Car dependency depletes natural resources, causes congestion and lost productivity, degrades air quality, and becomes a significant contributor to climate change.

Jacobs identified that damage could occur through fragmentation and barriers (e.g. highways) that split the urban fabric into elements that are no longer functionally viable, or through large pockets of land uses (e.g. housing or schools) which create, in their own way, dead end “border vacuums”. To overcome this, Jacobs advocated a continuous walkable urban fabric. She thought it was possible to reverse engineer damaged areas through strategic initiatives and, as with Kevin Lynch, believed it possible to overcome barriers (such as parks or rivers) by treating them as “seams” that interlocked the sides (e.g. Central Park has uses that penetrate both edges; bridges perform similar function).
Tackling barriers

Examples from Portland illustrated how large uses, which would typically create “border vacuums”, can be integrated into walkable urban fabric: a university campus; industrial districts that support mixed use; shopping malls; a hospital that spans over city blocks connected by tunnels and bridges. Instead of creating barriers, Mehaffy described the need for cities to accommodate vehicular mobility in a graduated manner through to the finer scales. If pushed out to the perimeters, the paradox of ‘induced demand’ shows that arterial highways become triggers for sprawling out of town facilities and even more low-density, low-connectivity, car-dependent urbanism. The talk illustrated how it is possible for major roads to be taken into the heart of cities, if properly designed.

Walkability

The Urban Design Studies Unit of the University of Strathclyde has identified that most successful walkable cities have an optimum spacing of major vehicular through streets at 400 metre centres. This optimum balance between pedestrian and vehicular mobility - referred to as ‘the 400 metre rule’ - was shown to be consistent across cities such as Portland, Bologna, Oslo, Paris and London.

The 400 metre spacing permits streets large and straight enough to carry vehicles at relatively calm, pedestrian-friendly speeds, yet small enough to be walkable; allowing reasonably short paths to nearby walking destinations – which might be a transit stop or a local shop or service. The resulting neighbourhood areas (“sanctuaries”) offer pedestrian priority where vehicles are unable to navigate a direct path, meaning that they move more slowly, and residential areas remain relatively quiet and safe. Mehaffy noted that the neighbourhood forms across and around the 400 metre network, instead of being contained within it: “We are no longer planning by neighbourhood templates”.

A second rule – the ‘4 metre rule’ - was discussed as being the critical zone between the pavement and the building, fundamental to urban vitality. This rule reiterates Jacob’s concern to provide attractive, diverse walkable environments that are appealing to pedestrians. Research confirms that streets require visual interest, the architecture needs to express human activities and human patterns, and there needs to be a modulated interface in the form of a series of graduated zones, from private to semi-private to semi-public to public. This fine grained approach based around the scale of the plot (or ‘plot based urbanism’) permits processes of adaption and self organisation over time, and is the grain at which much urban vitality is ultimately generated.

Mehaffy expressed surprise that more focus hasn’t been placed on either of these ‘rules’ that aid interconnections and enable a critical mass for the proper functioning of healthy neighbourhoods: the ‘4 metre scale’ and its self-organising capacities, and the ‘400 meter scale’ which is the interface of pedestrian and vehicular movement.
Conclusion

The lecture concluded with a call to recognise again the fundamental importance of the walkable fabric, as a form of “urban trellis” on which stronger neighbourhoods and cities can regenerate; with the right elements planted at the right scale, in effect providing a form of “urban seeding” of key ingredients. The observation that we live in a world of “organised complexity” where we can no longer continue to use old prescriptive linear methods that have failed us coincides with Jacobs’ final conclusion about “the kind of problem a city is”.

The lecture demonstrated that effective strategies are possible toward regenerating and making resilient and sustainable places based on an evidence-based approach that operates at the right scales and creates a framework that aids complex, healthy, self-organising urban growth.

Key points from the lecture included the need to:

- overcome barriers and aid connectivity through maintaining a walkable urban fabric
- enable ‘choice architecture’ where citizens can exercise genuine choice
- no longer rely on prescriptive models, but allow self organising complex systems to evolve
- ‘seed’ development through strategies at the correct scales: a fine grained plot based ‘4 metre scale’ ensuring street vitality, and a coarser ‘400 metre scale’ ensuring the optimum balance between pedestrian and vehicular mobility