Modality Environments

A Concept For Sustainability And Vitality In The Multi-Modal City

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MODALITY ENVIRONMENTS:

A Concept For Sustainability And Vitality In The Multi-Modal City

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ABSTRACT

This paper reviews an idea of vital local high-street places with their walking spaces and economies founded in interfaces between neighbourhood and city (between walking and public transport/bicycle movement infrastructures). It then extends this idea to higher scales, considering interfaces between city and region, which have already been theorised as 'mobility environments' (Bertolini & Dijst 2003) focusing on places and modal transfer points in new regional cities of high mobility. High-streets and mobility environments are both central places and our way of describing them suggests a new definition of central places as interfaces between normative (but also technically-infrastructually supported) political spaces (neighbourhood, city and region). It also clarifies the role of scale in place theory and we will deal with this in a following paper. Here we introduce ideas of 'modality places' and 'modality environments'. The 'modality environment' is concerned with areal and network transportation forms in whole fabrics and resulting conditions of sustainability and urbanity. Modality environments are understood in terms of transportation networks and the social and functional factors (like sustainability and urbanity) they produce. Modality environments are seen as lived environments built around movement infrastructure grids that distribute everyday urban functions. Ideally modality environments would be simple clear grids that distribute all or close to all the functions of everyday life so that a walking grid or a bicycle grid that gets adults to work, their children to school and includes shopping and recreation would be walking or bicycle modality environments. They would be expected to have high levels of direct visibility-legibility in the way urban elements present themselves to a mobile community. Modality environments would also include the central places (like high-streets or mobility environments like stations) at which people would transfer to other modality environments.. We will use a notion of 'movement culture' to indicate the convergence of land uses and mobile communities mediated in information-rich networks. We are concerned first with how modality environments (for cycling or walking for example) may afford more sustainable lifestyles. We are concerned in addition with the ways they can be designed to include central places as zones of urbanity and vitality and as socially and culturally mixed centres. We start not with a principle of accessibility of/from nodes in an extensive space but with the idea that particular social and political territories (communities and polities) are already articulations of distinct modality environments. We demonstrate using the case of the Amsterdam metropolitan area.

KEYWORDS

Modality environments, mobility environments, urban sustainability, urbanity, urban design

1. SOME BACKGROUND: WHY DOES SPACE SYNTAX WORK?

We have already argued (Read 2014) that the working of space syntax does not necessarily validate the official version of its theory and that explaining space syntax's efficacy as a model of urban form and function in a different way, using a different theory, may open up also new insights into the nature and function of cities (O'Sullivan 2004). More generally, the model of science embedded in particular models may be inadequate to the task at hand and may lead us astray through embedded conceptualisations of time and space. We believe we are compelled to think historically about structure if we are to understand the ways physical and human geographies come together (Massey 1999).

We have proposed that the reason space syntax works is because there is a structure already historically embedded in the layouts of cities (Hillier 1999; Read 2005). This structure is a network, referred to as the supergrid, that in space syntax terms radically 'shortens' city-scale trajectories through the city. Total 'distance' through the city is minimised by this device and space syntax measures therefore reflect predominantly 'distance' from the 'supergrid' into neighbourhoods. In very broad terms, well-integrated areas are those with (locally) very close, transparent relationships between city (reflected in the supergrid) and neighbourhood (non-supergrid) spaces.

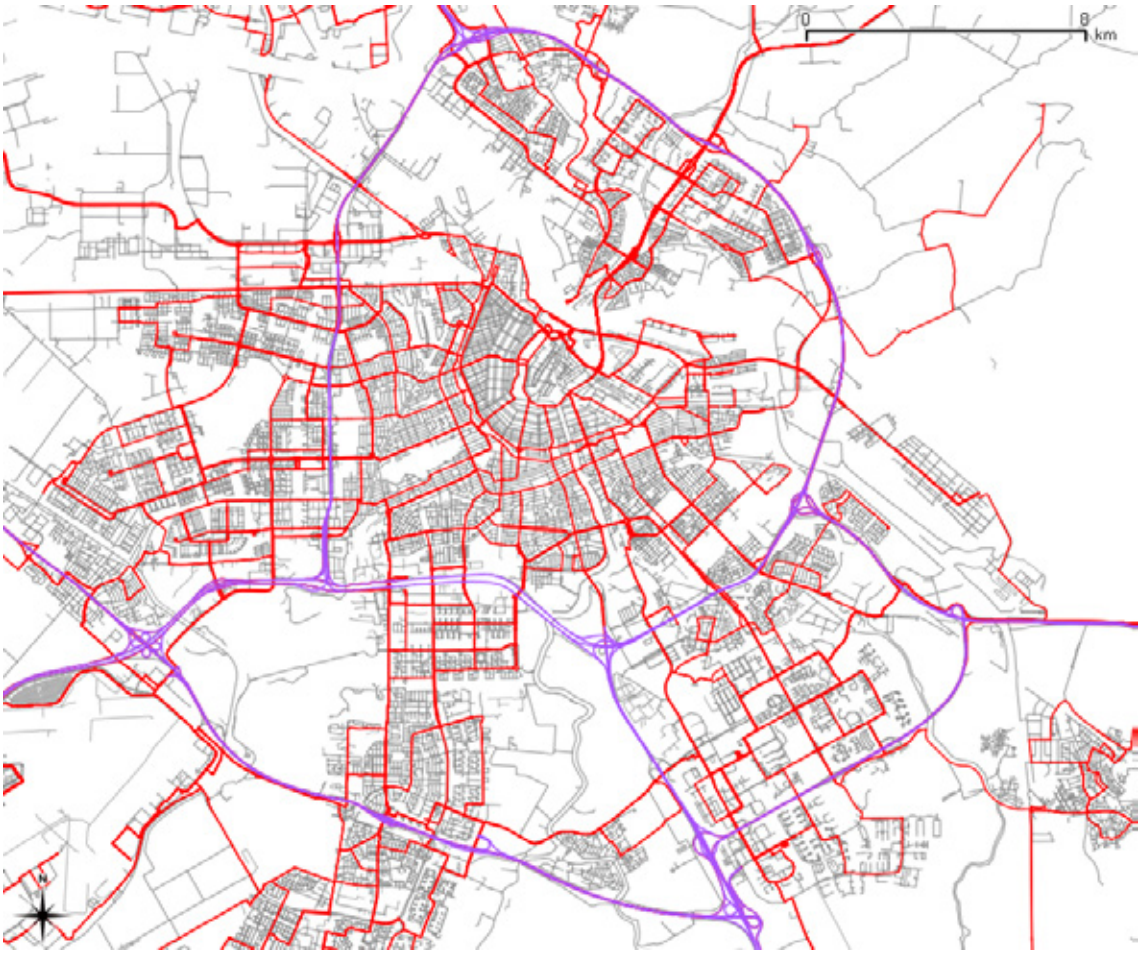

Figure 1 - Amsterdam: showing the supergrid. We see how neighbourhoods are made distinct (given their presence) not as bounded territories on a map but as a fine-grained network centred on a courser-grained network. Image: Jorge Gil

Space syntax thus reveals a characteristic structure in European industrial and other cities. But the structure exists before the rationale space syntax offers for movement structure and for other reasons than space syntax gives. It is not an emergent consequence of trips through the city (from everywhere to everywhere). It is first simply an intervention and a construction made in a certain time for quite clear strategic reasons: to distribute the major institutions, land uses, commerce, neighbourhoods and centres of cities and to carry the city-scale traffic between these elements (think of Haussmann's interventions for the remaking of Paris). It is secondly a 'technology of memory'; acting as a whole it is the externalised memory (Stiegler, 2006) and orientation map of the elements and centres of a city, as they are articulated around a material grid.

It is thirdly (and this is where our theory of place and centrality comes in) the line of interface between two grids, the other being the much finer street and block grid of the neighbourhood. This is an interface between different scaled and constructed grids but also between different scaled logics and definitions of community and emplacement (of the neighbourhood and the city in this case). It is lastly and as a consequence of the last, a centre of the lives and activities of people moving in and oriented by the neighbourhood grid.

A grid here is a distributor of elements and a medium of movement, at whatever scale, from a pedestrian street-block network to an industrial city supergrid and further (highways, railways and air transport systems). It is at the same time a medium of urban order and it constructs and is a condition of a polity and community. It is infrastructural, part of a huge, integrated technical adjunct to human existence that includes "cars, roads, municipal water supplies, sewers, telephones, railroads, weather forecasting, buildings, even computers in the majority of their uses [that] reside in a naturalised background, as ordinary and unremarkable to us as trees, daylight, and dirt" while it links "macro, meso, and micro scales of time, space, and social organisation ..." (Edwards 2003).

It works by distributing characteristic formative and identifying features of the community it contains (a village grid distributes a church, a school, a town hall, a market, a baker and a blacksmith; an industrial city supergrid distributes centres and neighbourhoods and cultural and political institutions like museums, libraries, churches and administrative buildings. It also distributes commerce pretty well continuously. This organisation and 'centring' of a polity on a grid has qualitative cultural and experiential consequences due to the way it interrelates and creates a complex compound of land uses and does this by making things visible and legible in movement.

We interpret space syntax not in terms of an analysis of access in a city or area therefore but in terms of a revealing of an historically built construction that is of its time. We understand urban structure to develop as new strategic interventions and constructs of relations between scales – those of the city and the region and the neighbourhood and suburb and the region – appear. A brief introduction to some of these changes will be included in the main text.

These constructs establish conditions of urban orientation, knowledge and experience. They found urban spatial cultures and qualities. They may be a source of the productivity of human societies and the way for urban designers to these qualities and productivities may be directly through an understanding of these forms-constructions and their workings.

We wish here to use and develop these insights to look at the issue of transportation and its division into modes from both historical and normative points of view. We are concerned with finding paths to sustainable transportation, which means paths to increasing pedestrian and cycling traffic and reducing dependence on the motorcar. We conclude that areas strongly adapted to pedestrian and cycling modes already exist in the central (historically industrial or pre-1930s) parts of (certainly European) cities. Normatively we propose that in order to create strong pedestrian and cycling zones we should learn from the success of historical centres and that part of the lesson is the structuring of life around grids that carry and represent in direct and visible ways all, or as many as possible, of the functions and elements of everyday life.

2. SOME THEORY – NETWORKS, PLACES AND SCALE, AND SUSTAINABILITY

We see this revision of space syntax theory as linking to a strongly materialist and earth-bound tendency in understanding human and social conditions. The notion of the Anthropocene draws earth and human histories as well as geological, biospheric, climatological and human worlds into the same orbit of discussion (Crutzen & Stoermer 2000). Peter Haff has added the Technosphere to the discussion as an objective reality of not just humans but also of geology, biosphere and climate (Haff 2014). This huge socio-technical, exosomatic apparatus is structured, following and developing Sloterdijk (2013), as a system of interiors and this historical structure (or better construct) to a very large extent constitutes our urban as well as human geographies (Read 2017).

The 'space' here is basically network space understood in a material and technical (and constructed) way, and 'interiority' refers to the inclusions of networks – as relating-including particular things and places – while 'exteriority' refers to their limits and exclusions and to a multiplicity of networks – as things and places are included in some networks and excluded in others. Networks here are infrastructures, concrete technical apparatus made in particular times to connect particular places together. These are already scaled, as opposed to the non-scalar abstractions of networks in some urbanisms and geographies.

In place of a metaphysical 'space' that is everywhere equal into which we insert static abstractions like scale and oppositions like urban-suburban – even things of unspecified and undetermined scale like 'community' – we have concrete spaces that have been already differentiated in their dynamic and historical compositions and relations and that support and specify places, scales, territories, urbanities and communities through the relations established. This may be seen as part of an historical process of making complex relational things like places distinct in the world that Derrida described as a process of différance (Derrida 1976). We would include urbanisation as one of these processes.

This technical-relational dimension of network and place is retheorised (Read 2014; Read 2017) and is summarised in its most relevant points here. Networks are discrete and to a degree autonomous in that they work as wholes through their 'internal relations'. But they are never tabula rasa because they include historical places that pre-existed them. They at the same time (re)structure these places by including them (and by excluding others) and by transforming included places as a product of the 'internal relations' of included places with one another in the network. These discrete networks exist across the range of sub-planetary scales – as distinct scales that interrelate and overlap and often nest in one another. The resultant basic structures of places and scales tend to be quite consistent at least across continental and global regions (and to become more consistent with time).

The places that particular networks include together, are not arbitrary. They are selected according to a strategic logic of the network itself and its constructors. Strategies may be to connect neighbourhoods (horizontally) into a city or cities (horizontally) into a nation and pre-existing places will be selected to these ends. Places and their scales become regularised and formalised though their inclusions, revealing their significance and identities as political entities in their relations with other places. Neighbourhoods, national cities and world cities are all places of particular scales. They all include other scales as well however that are strategic to their existence as neighbourhoods, cities etc. and that define further their properties and qualities as places. A neighbourhood place has a (vertical) relation and serves as an interface with a specific city and it is this coupling that gives the neighbourhood its distinctive properties and qualities. Likewise a city has a (vertical) relation and serves as an interface with a nation through national networks or has a relation and serves as an interface with the globe through global networks.

All places have more than one network and no place has just one scale, though all of its scales will be consequences of networks it is part of. Places are always two (or more) -sided in that they may be seen as place-environments from the inside (inside a neighbourhood for example) while they may be seen as place-objects from the outside (from somewhere else in the city or the world for example). The place is necessarily also an interchange, a crossing point and

an interface between networks. This is the foundation of its centrality as a place. Centrality is therefore always also always multicentral; a global-national centre (like Schiphol Airport) or a national-city centre (like Amsterdam Central Station) or a city-neighbourhood centre (like the Ferdinand Bolstraat).

Place change will be a consequence of specific inclusion-exclusion and interface-interchange strategies and dynamics. Infrastructures become in this way a hugely important strategy for the design and roll-out of modern polities and societies (Hård & Misa 2008; Levin 2010; Van der Vleuten 2004; Read 2017). The places that become national cities, when railways are constructed for example, will in most cases be cities already, and the choices of which cities to include in main lines will be a charged and political affair. The choices for neighbourhoods to be connected into a tram network will be strategic and linked to local ambitions for places and overall political strategies for the city. At the other end of the scale, global and world cities are a select group of cities that themselves put effort and invest political capital in strategising to remain in or become part of the networks of global and world cities (Knox & Taylor 1995; Taylor & Derudder 2004).

The network technologies and their inter- and co-organisations to a very large extent themselves create the scales as well as the particular attributes of places in the network. Thus 'scale' is not just descriptive of places, it refers to particular constructions and configurations of networks and to the use to which people put places in acting in the world. Networks are at the same time complicit in this use; it is impossible to act at a city scale, or nationally, or globally without engaging a network of the appropriate scale. What other meaning can 'scale' have in relation to human geography? Power is therefore not just about a politics of territorial strategy and competition, it is also about the capacities network technologies, and the places formed in them, afford people when they have access to them.

The whole layered system is of organised 'horizontal' relations within networks complemented by organised 'vertical' relations between networks. This is rather different to network theory which does not differentiate between a network of neighbourhoods, a network of cities or a world city network, which sees networks exist simply against a background of a cartographic or geodetic surface where scale is not an intrinsic factor. In fact Marston et al. (2005) claim that scale does not exist in geography and Bruno Latour's scales may be crossed without difficulty only when he discounts the difficulty of building them in the first place. The places involved in the activities above are however not simply location mapped by cartographic coordinates in a universal extension. These are places already particularised, identified and scaled by the particular concrete networks they have been built in or appropriated into. These places have further been developed and enriched through the activities the networks facilitate.

3. MODALITIES, 'TOPOLOGIES' AND CHANGE

We have previously called the resulting 'horizontal' technical-political constructs 'technospaces' (Read 2013) and the interfaces between 'vertically' related technospaces 'technoplaces' (Read 2017). We will rename technospaces here 'modality environments' and where appropriate technoplaces as 'interchanges' to discuss issues of multi-modal transport. Modality environments, as we have seen also carry the normative and political aspects of polities as well as the 'communities' and 'cultures' of these polities. But such a 'topology' exists most clearly and explicitly in modern transport networks and interchanges, making new places and cultures as a product of infrastructural change, and undermining and problematising or at least changing the previous setup.

The factor of scale here ties particular technical networks to social practices through differently scaled and sized networks of mobility – of walking, of cycling, of travelling by tram, or by train or car. What is important is that in the periods when these networks were made urban social practice was contained in these networks. Preindustrial communities used their feet and their lives were centred on and contained in walking-scaled modality environments, industrial communities use urban public transport and their lives are centred on and contained in public transport-scaled modality environments and post-industrial or suburban communities

use motorcars and their lives are centred on and contained in motorcar-scaled modality environments for example. Epochal changes have involved the wholesale shift of communities and even populations from one dominant transport mode to another connecting a whole different array of life factors together. But at the same time different modality environments, the highway system, an historical industrial 'supergrid' system and a pedestrian system, for example, may and do coexist alongside one another.

In public transport networks 'horizontal' connections are punctuated by stops (and stops are places on the network) and more significant stops will connect the whole system with another at a higher or lower scale (a tram interchange with a train system for example or in the case of TOD a transit interchange with a 'pedestrian pocket' (Kelbaugh 1989). Also train and bicycle, train and bus, train and tram, train and metro, car and bus etc. relations are organised in highly planned interchanges. But these are modern cases of what we argue is an historical and 'generic' process not limited to modern networks.

These modality environments relate back to their histories through the ways they are built over previous human-technical constructs so that neighbourhood networks may be adaptations of village networks for example or regional centres may be adaptations of neighbourhoods. Also they don't always specify hard distinctions between transport modes (cars, bicycles and trams all use mid-scale 'supergrid' routes for example, but interestingly, all tend to the same speed). Modern intercity networks will be built next to or be adaptations of older intercity networks and regional or suburban networks may be adaptations of older intercity networks. This gives us potentially more precise formalisations of the role of movement technologies in social-urban practices and the changes of these. It at the same time restores to history a central role in the structuring.

Sustainability is a relatively simple matter in the mobility discussion. It concerns the extent to which everyday movements are extended and transfer to non-sustainable modes like the car. We have potentially here a framework to discuss this in terms of a shift of dominant lifestyles from being centred on a modality environment like the supergrid to a high scale modality environment like the highway system.

4. EXTENDING THE 'MOBILITY ENVIRONMENT' CONCEPT

Modalities in the discussion above are linked loosely to particular networks. These networks are at the same time much more tightly related to scales and to the polities normatively linked to those scales – to neighbourhoods, cities, regions and so on. Some may object, saying there is no necessary reason why mobility networks should relate so strongly to polities. We will say this tends to be so historically and argue that the tighter link with scale is certainly sustainability related in that it refers back to times when daily movements were shorter and relates to a value ascribed to older historical structures: that one does not need to use ones car for a larger number of everyday journeys and activities. It suggests shorter distances in general between the different elements (home, school, work, shopping etc.) of everyday life. At the same time the integration of functions and movement with their visual aspects carries legibility and cultural consequences and we argue later there is a 'normative tendency of modality places' – with an integration of urban life and its visual aspects around lower speed grids.

Luca Bertolini has argued that mobilities today are threatening established social and political territories and places of belonging (Bertolini 2006). His idea of the 'mobility environment' was a response to the increasing mobility of people and their increasing independence of physical boundaries, focusing on places and modal transfer points in new regional cities of high mobility and aiming to describe better the effects and transformations of mobilities on regions (Bertolini & Dijst 2003; Bertolini et al. 2005). Mobility environments are "places where mobility flows interconnect—such as airports, railway stations, and also motorway service areas or urban squares and parks". They "have the potential for granting the diversity and frequency of human contacts that are still essential for many urban activities" This is a concept to "help better articulate planning and design strategies that try to cope with the reality of an increasingly borderless urban system" (Bertolini & Dijst 2003). He saw the "need to link effectively the debate

about the transformation and expansion of infrastructure networks to the debate about the design of places and the more general debate about the cities we need and want, or 'urbanity'" (Bertolini 2006).

In this framework Bertolini is also dealing in modes and modal changes in a city of variable speeds and seeing centres as transportation interchanges. He has however no spatial mechanism for this, what he does is investigate the distributions and gradients of attributes over a universal extension and in a graph space that mixes 'space' and 'place' attributes. The discussion is based in a space as extension across which access is gained (against a 'friction' of distance). It is onto this surface that places and networks as well as bounded territories are inscribed and tensions set up by the goods, people, money and information moving in different modes and at different speeds over territorial bounds. This is sometimes presented as an irreducible tension between different conceptions of space and place (Castells 1999), while we argue that the territory does not sit between oppositional (metaphysical) conceptions of a global network and a bounded place but should be seen somewhat generically as places and centres of interchange between different networks – and that means between different scales, modes and speeds. We can see territories as more than the legalistic abstraction depicted on maps and show more explicitly how mobilities are, to quote Bertolini, "a central, structuring perspective on the development of cities" (Bertolini 2012).

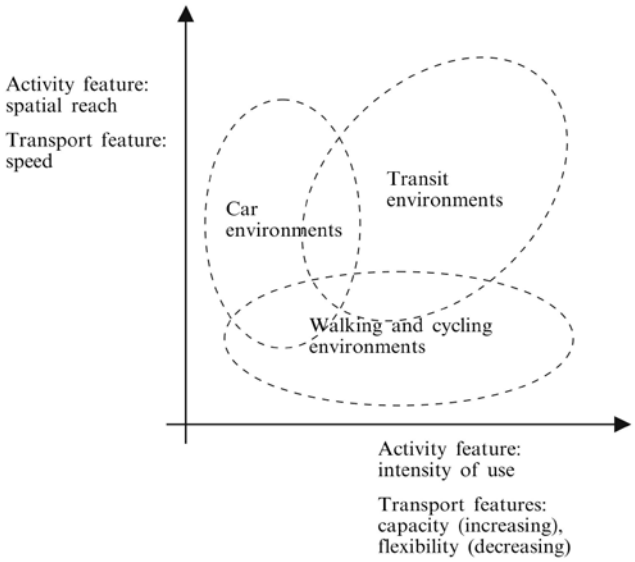

Figure 2 - Principles of multimodal urban-regional development: conceptual scheme. Image: Luca Bertolini

What Bertolini says is true as far as it goes but, operating in metaphysical space and without a spatial mechanism, he can say little about how changes are happening or how distinctions in the urban field are operationalised. We believe the spaces involved in the changes should be intrinsic to the explanation of how changes occur. Our 'articulated networks' approach goes further than the modern transport interchanges the concept of the 'mobility environment' was designed to address to include a number of other articulations of networks of different scales and relate these to notions of 'place' and 'centre'. Bertolini's mobility environments remain for the most part a regional-scaled subset of this.

The modality environment approach 'lifts' us out of an insistent horizontality and offers spatial mechanisms for vitalities, centralities, urbanities, sustainabilities and capacities for mobility in modern regions and cities.

5. AMSTERDAM'S POST-WAR CHANGES

Societies are 'scaling up' in the changes that have occurred in European cities since the Second World War, and this occurs not in a generic extension but in specific new networks constructed with and incorporating new infrastructures and new mobility practices, while being at the same time constrained by the complex organisational and path dependent effects of new with old networks.

Social and functional lives that were previously lived in places and networks at the scale of the industrial city are now lived in places and networks at the scale of the region. People who used to live in an urban neighbourhood, shop on foot in the neighbourhood, send their kids to school by bike, and go to work by bike or by tram in the city, now live in a suburb, go shopping by car in an out of town centre, send their kids to school by bus or take them by car in another suburb and go to work by train or car in the city centre or in another city altogether. This 'rescaling' involves a relocation of lives, from being located on, and oriented by, neighbourhood and city grids to being located on, and oriented by, regional and city grids. This is not simply a relocation in Cartesian coordinates, this is a relocation to different modality environments – to new technospaces centring new configurations of urban life-elements. This also changes the very conditions of urban life – of the 'urbanity' Bertolini refers to.

Taking Amsterdam as an example, and moving on from our previous discussion of life on the supergrid, Amsterdam restarted its development after the hiatus of the 1930s Depression and the Second World War with a huge reconstruction programme lead in the first instance by the Marshall Plan which emphasised economic liberalisation and modernisation and the building of highways and the promotion of oil and automotive industries. It involved also a massive housing programme built on a very different pattern to that before the war and reflecting the growing influence of the motorcar and a 'post-industrial' job market and consumerism.

The Netherlands are reputed to have not had suburbs before the 1990s because of strict controls of the boundaries of cities. This is not however strictly true because 'suburbs', well connected to the new highways, were simply tucked into the edges of the existing cities. The pattern was that while the highways were being built a new network of accessways to those highways was being established to service the new housing. While this connected with the already built supergrid the new network was built not as a grid of streets but as a set of traffic arteries and not connected liberally and directly to the neighbourhood but minimally and often indirectly as a means of car access and traffic control. The new neighbourhoods were no longer centred on these roads but bounded by them. This new network was also clearly not another somewhat autonomous grid but reduced to a set of dedicated directional connectors to the ring road and highway network.

In the Netherlands these changes were countered energetically through the 1980s and 90s (Ligtermoet + Louwerse 1999) with a campaign for the re-adoption of cycling as a dominant mode of transport. The new roads got dedicated cycling paths; what they didn't get back was the easy legibility and Jane Jacobs-like streets and community of the pre-war city. The new roads were formalised as 'S-roads' (highway to housing project connectors) and it is along these we find the new postwar development projects. The inner-city neighbourhood had been supplemented by a new form of 'suburb in the city' designed for efficient access to the ring and inner city areas were 'regenerated' by connecting them directly to the ring road.

The person or family that moves from city to suburbia moves from being centred by a grid (the supergrid) which facilitates a life lived (from home to work to school to shopping and entertainment) on a tram or bicycle and within a radius of approximately 5-10km, to being centred on a grid which facilitates a life lived in a car for the most part and within a radius of 50-100km. This is not to say there are no provisions for cycling in the new regional city because there are. Even so the whole shift from city to region has been premised on a scale of suburban living with both a practical and a cultural emphasis on the motorcar and longer distances to everyday life-elements. New centres have been built, very often mobility environments articulating regional and city networks, bringing suburbanites back into the inner city to shop or to work. But the fact is they arrive more often than not by car, and even if they don't they

experience city networks as places to go to (as object-places) rather than as places to be in (as environment-places).

It is on this contrast we base our view of sustainability in the contemporary (particularly European) context. What this contrast also points to is the loss of a visible, legible 'movement culture' – an 'urbanity' – of the type we saw on the streets of the pre-war European city as we move away from the industrial city supergrid. At the same time we see a reduction of cycling in Amsterdam from 48% of all trips around the centre to 32% for the city as a whole. Cycling as default transport mode is much more a reality in the zone covered by the supergrid than in peripheries, even when the difference in actual accessibility of urban life-elements is hardly reduced. In the suburban areas beyond the city the figures reduce still more.

A viewpoint that assumes a universal extension will not easily understand this loss of urbanity and its necessary link to the supergrid and pedestrian grid. Today we still see this urbanity, but increasingly often in a car-accessed 'regenerated' form that forms an element in basically regional life patterns and tends to degenerate the streets with the increased car traffic.

6. A 'NORMATIVE TENDENCY OF MODALITY PLACES' AND SOME STRATEGIES FOR MODALITY PLACES

This discussion shifts the sustainability and urbanity problematics. Urbanity has a strong 'cultural' dimension, tied historically to networks and their centrality and community factors, and it tends to be under threat in the new regional conditions. Sustainability is about reducing travel distances and especially about moving to slow modes of transport that do not use fossil fuel energy. What the discussion indicates is that sustainability, like urbanity, is not something present in potential just anywhere in an unlimited extension, but tends to be produced in the same city grid-neighbourhood grid historical pattern.

The 'pedestrian pocket' idea (Kelbaugh 1989) is a relatively simple interchange between transit and pedestrian networks that can be extended with an overlapping bicycle network. The similarities between this and the industrial city (supergrid) pattern suggests there is potential here for creating sustainable centres with urbanity. Another possible strategy for creating modality places away from historical central areas looks to create a convergence of structures of land use and their simultaneous legibility around a transparent movement grid in interactive and participatory ways. An online interactive tool that represents the bicycle network and the land uses it connects, performs some simple analytical processes related to network-land use integration, network transparency and distance, can (eventually) be used as a handy route-finder, and engage the public in altering and evolving the network while using the tool. The engagement of the public may further encourage the take up of the bicycle as default transportation mode. We want to provide controlled options to change network and/or land use in realistic ways to get better results. The collected results of these engagements could then be fed into meetings between users and transport and land use planners to 'evolve' a better bicycle network over time. The ambition is to evolve the network and land use integration continuously and incrementally and in a interactive and participatory way, to create a radically higher integration of network and land use (to the point the network becomes information-rich and 'intelligent').

The bulk of new development tends still to be attached to the historic cities but connected away from these centres to the highways rather than towards them through the supergrid. Traffic planning after the mid-1980s tried to minimise car use and this was the period – through to the 2000s – when efforts were made to concentrate development in transport interchanges (mobility environments). Railway stations in particular were sites for the largest number of new projects. Even greenfield (Vinex) housing would often include new public transport. It was this development phase that Bertolini's work addressed. Today's (overheated?) real-estate demand and activity has meant that transport development has fallen behind housing development and sites along the S-roads are again being exploited, with the expectation these will be attractive to car users. The form of new development has also changed with a lot more high-rise being built and new shopping and other facilities being 'mall-like' or 'centre-like' and not related to

the street. This tendency combines with another of rising rents, which means that many of the small shops that relied on a street relationship are being priced out.

We see the possibility of hybrid approaches and would like to position this modality environment approach to address these changes by making on-going use of the qualities of supergrid street structures even while new forms of development are being pursued.

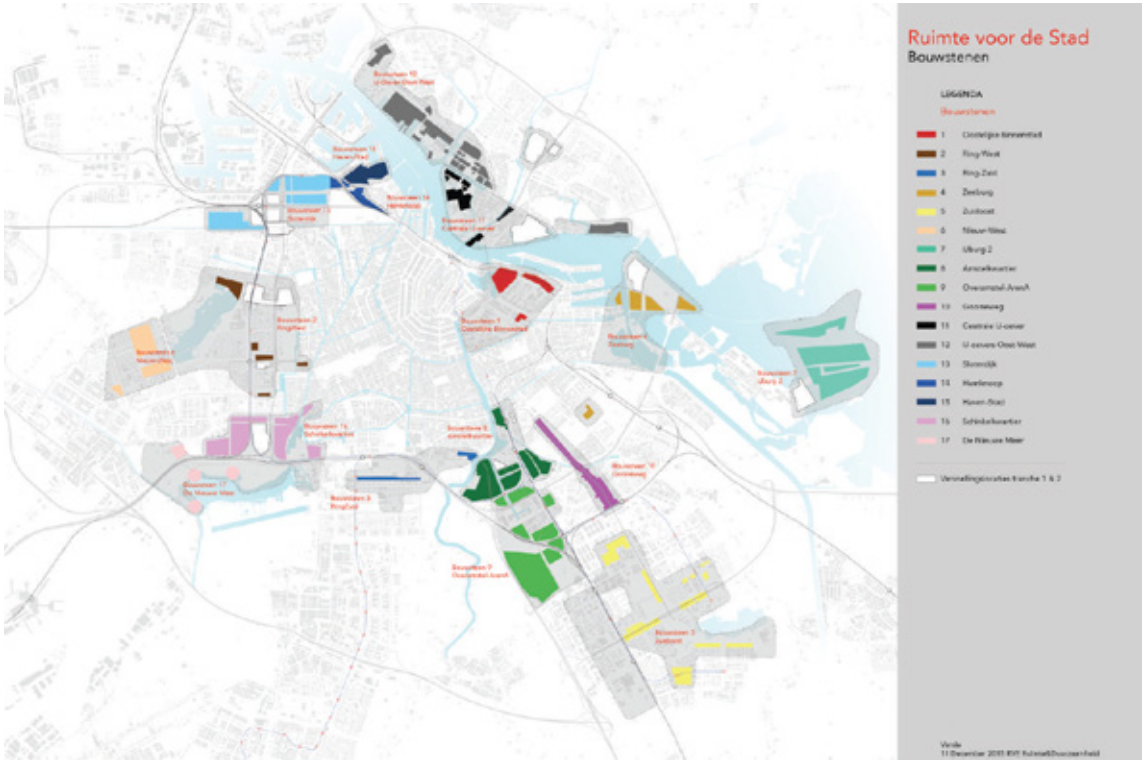

Figure 3 - New development sites in Amsterdam. All are linked strongly to the ring road. Image: dRO Amsterdam

7. CONCLUSIONS

Problems emerge with the 'scientific' abstractions of extensive space embedded in our modes of analysis. Such a uniform generic space implies uniform generic potentials for effects such as sustainability and urbanity. There are clear indications such potentials do not exist in this way and our explorations need to take on space itself (which must mean the space we have constructed) and attempt to model the sorts of material complexities that we have constructed and their consequences. Our 'projects' of 'modernity' have each built on the past to construct their own and new sets of metageographical elements and shaped particular modes of urbanisation. Specific spaces are constructed at different historical moments – we see the construction of a new regional space after the Second World War for example – and the switch of dominant processes from an older urban to a new regional space can only be understood in historical and spatial context. Any attempt to unify interpretations of spatial forms across such transitions will risk missing the point. Sustainability questions must be assessed in these historical and spatial contexts and in relation to the whole new relations of urban life that new spaces may engender.

REFERENCES

Bertolini, L., 2006. Fostering Urbanity in a Mobile Society: Linking Concepts and Practices. Journal of Urban Design, 11(3), pp.319–334.

Bertolini, L., 2012. Integrating Mobility and Urban Development Agendas: a Manifesto. disP - The Planning Review, 48(1), pp.16–26.

Bertolini, L., le Clercq, F. & Kapoen, L., 2005. Sustainable accessibility: a conceptual framework to integrate transport and land use plan-making. Two test-applications in the Netherlands and a reflection on the way forward. Transport Policy, 12(3), pp.207–220.

Bertolini, L. & Dijst, M., 2003. Mobility Environments and Network Cities. Journal of Urban Design, 8(1), pp.27–43.

Castells, M., 1999. The informational city: information technology, economic restructuring, and the urban-regional process Reprinted., Oxford: Blackwell.

Crutzen, P.J. & Stoermer, E.F., 2000. The "Anthropocene". , 17. Global Change Newsletter, 41, pp.17–18.

Edwards, P.N., 2003. Infrastructure and Modernity: Force, Time, and Social Organization in the History of Sociotechnical Systems. In T. J. Misa, P. Brey, & A. Feenberg, eds. Modernity and technology. Cambridge, Mass: MIT Press, pp. 185–225.

Haff, P.K., 2014. Technology as a geological phenomenon: implications for human well-being. Geological Society, London, Special Publications, 395(1), pp.301–309.

Hård, M. & Misa, T.J. eds., 2008. Urban machinery: inside modern European cities, Cambridge, Mass: MIT Press.

Hillier, B., 1999. The Hidden Geometry of Deformed Grids: Or, Why Space Syntax Works, When it Looks as Though it Shouldn't. Environment and Planning B: Planning and Design, 26(2), pp.169–191.

Knox, P.L. & Taylor, P.J. eds., 1995. World cities in a world-system, Cambridge ; New York: Cambridge University Press.

Levin, M.R. ed., 2010. Urban modernity: cultural innovation in the Second Industrial Revolution, Cambridge, Mass: MIT Press.

Ligtermoet + Louwerse, 1999. The Dutch Bicycle Master Plan: Description and evaluation in an historical context, The Hague, The Netherlands: Ministry of Transport, Public Works and Water Management.

Marston, S.A., Jones, J.P. & Woodward, K., 2005. Human geography without scale. Transactions of the Institute of British Geographers, 30(4), pp.416–432.

Massey, D., 1999. Space-Time, "Science" and the Relationship between Physical Geography and Human Geography. Transactions of the Institute of British Geographers, 24(3), pp.261–276.

O'Sullivan, D., 2004. Complexity science and human geography. Transactions of the Institute of British Geographers, 29(3), pp.282–295.

Read, S., 2013. Intensive urbanisation: Levels, networks and central places. The Journal of Space Syntax, 4(1), pp.1–17.

Read, S., 2013. Technospace ecologies. In AESOP-ACSP Joint Congress 15-19 July 2013 Dublin. AESOP-ACSP Joint Congress. Dublin.

Read, S., 2014. Rethinking Social Relations: Towards a Different Phenomenology of Places. In S. Rau & E. Schönherr, eds. Mapping Spatial Relations, Their Perceptions and Dynamics. Lecture Notes in Geoinformation and Cartography. Cham: Springer International Publishing.

Sloterdijk, P., 2013. In the world interior of capital: for a philosophical theory of globalization, Cambridge: Polity Press.

Stiegler, B., 2006. 'Anamnēsis and Hypomnēsis: The memories of desire', in Bradley, A. and Armand, L. (eds) Technicity. Prague: Litteraria Pragensia.

Taylor, P.J. & Derudder, B., 2004. World City Network: A Global Urban Analysis, Taylor & Francis.

Van der Vleuten, E., 2004. Infrastructures and Societal Change. A View from the Large Technical Systems Field. Technology Analysis & Strategic Management, 16(3), pp.395–414.