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## POTENTIALS AND CHALLENGES OF POLYCENTRIC CITY-REGIONS: A CASE-STUDY OF FRANKFURT RHINE-MAIN

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#### Abstract

Global urbanisation processes do not only account for quantitative growth, but also bring about qualitative transformations of our urban environments. They lead to the formation of new typologies of settlement forms. Besides the monocentric metropolises and mega-cities, we observe an increasing number of large-scale urban forms that grow together out of former single cities merging into one interconnected city-region. In many respects, Frankfurt Rhine-Main demonstrates the elements of a polycentric city-region, characterised by a network of large, medium-sized and minor centres that build up a system of decentralised centralisation. Challenges for sustainable development include the creation of integrated mobility systems, a nexus of settlement form and public transport, compact multi-functional nodes, connectivity of regional open spaces and the conception of a common vision for the future.

*Keywords: City-regions, Metropolitan Regions, Urban Development, Decentralised Centralisation, Cycloregion*

#### Streszczenie

Globalne procesy urbanizacyjne nie tylko przyczyniają się do wzrostu ilościowego, ale też powodują jakościowe przemiany naszych środowisk miejskich i wytwarzają nowe typologie form osadniczych. Poza metropoliami monocentrycznymi oraz mega-miastami obserwujemy wzrastającą liczbę wielkoskalowych form urbanistycznych wyrastających z dawnych jednostek miejskich, które łączą się w jedno miasto-region. Pod wieloma względami obszar Frankfurt Ren-Men wykazuje cechy policentrycznego miasta-regionu z charakterystyczną siecią dużych, średnich i małych centrów budujących system centralizacji zdecentralizowanej. Do wyzwań zrównoważonego rozwoju zaliczyć można tworzenie zintegrowanych systemów mobilności, połączenia między formami osadniczymi a komunikacją publiczną, zwarte węzły wielofunkcyjne, łączliwość otwartych przestrzeni regionalnych oraz koncepcję wspólnej wizji przyszłości

*Słowa kluczowe: miasta-regiony, regiony metropolie, rozwój urbanistyczny, centralizacja zdecentralizowana, cyklregion*

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### **Global urbanisation: A change for both quantitative and qualitative growth**

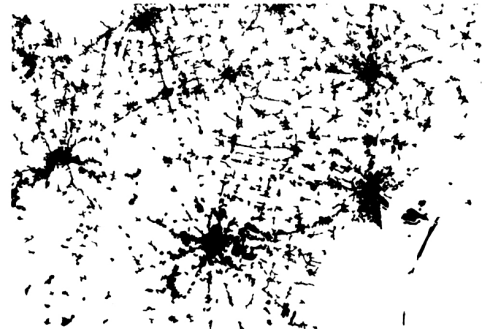
At the beginning of the 21st century more than half of the world's population live in urban environments. While a hundred years before it was only 15 per cent, in the year 2100 more than 80 per cent of the population worldwide is expected to live in cities. These developments implicate new challenges for urban and regional planning, which apply both to the agglomerations of the so-called developing world, which are still in a phase of continuous expansion, and those of the developed world, where expansion and shrinking processes are both taking place. The global urbanisation processes do not account only for quantitative urban growth, but also bring about essential qualitative transformations. They lead to the formation of new patterns and typologies of settlement forms, for which we do not have precedents in human history.

### **The emergence of new typologies of (polycentric) city-regions**

On the one hand, we still have the traditional 'monocentric' metropolises and mega-cities which have expanded to large regional cities, but still dominate their hinterland essentially out of the centre – such as London, Paris, and Istanbul, but also Cairo, Lagos or Mexico City. On the other hand, we observe an increasing number of new, large-scale and 'polycentric' urban forms that either result from a growing intra-urban decentralisation of the large metropolitan agglomerations or grow together out of former single cities merging into one extensive city-region. Examples of this latter type in Europe include e.g. the Randstad in the Netherlands (Ill. 1), the Rhine-Ruhr-Area in Germany, the Veneto region in northern Italy (Ill. 2) or the city-region of Frankfurt Rhine-Main. In northern America, regions as Southern California, Greater New York, or Baltimore/Washington can be mentioned in this context. In Asia, examples include the mega-city regions of Greater Tokyo or the Pearl River Delta.



Ill. 1. The Randstad in the Netherlands (source: Bürklin and Peterek)



Ill. 2. The Veneto region in northern Italy (source: Bürklin and Peterek)

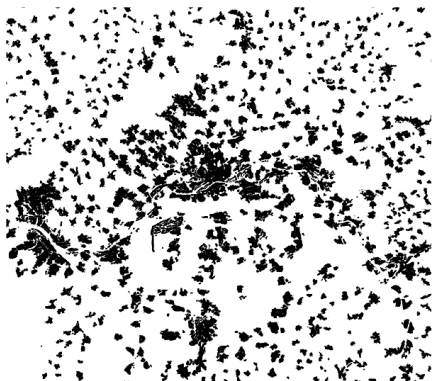
### **Germany's decentralised urban system**

The urban system of Germany has since ever been characterised by a decentralised pattern, as a result of a long history of multiple territorial states and capital cities before the national unification in 1871. Today, the eleven officially established 'metropolitan regions'

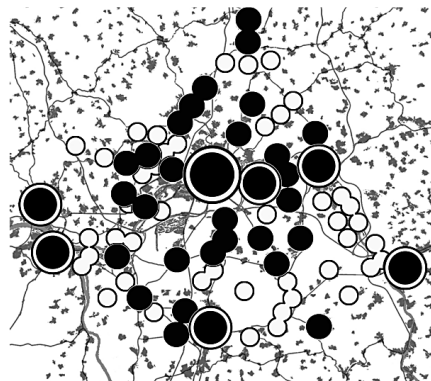
include in equal measures both monocentric (e.g. Berlin, Hamburg, Munich) and polycentric city-regions (such as the Rhine-Ruhr area, Stuttgart region, or Frankfurt Rhine-Main).

### Frankfurt Rhine-Main city-region

Located in central Germany at the confluence of the rivers Rhine and Main, Frankfurt Rhine-Main Metropolitan Region in many respects demonstrates the character of a contemporary polycentric city-region [4, p. 39-91; 17]. As a worldwide financial and service hub, with its international mega-airport, its industries, universities and research centres, cultural highlights and sports events, the region forms an integrated part of the global economy, politics and culture. Its overall impact is the result of a complex interplay of the city of Frankfurt with a series of important neighbouring centres, such as Wiesbaden, Mainz, Darmstadt, Offenbach, Hanau, Aschaffenburg, and a magnitude of smaller and medium-sized towns and municipalities located in a perimeter of up to 50 to 70 kilometres from the centre. Today, the overall metropolitan region is the home for about 5.5 million inhabitants in more than 450 municipalities. The 'inner urban core', from Wiesbaden in the west, to Aschaffenburg in the east and Darmstadt in the south houses about two-thirds of this total population.



Ill. 3. Frankfurt Rhine-Main in 2000 (source: Bürklin and Peterek)



Ill. 4. Decentralised centralisation in Frankfurt Rhine-Main (source: Bürklin and Peterek)

Likewise many other regional agglomerations worldwide, the settlement patterns and the urban landscape have radically changed over the last decades. The urbanisation footprint of the year 2000 makes it obvious (Ill. 3): the individual towns and municipalities have since long melted into one large entity, a complex city-regional compound. In this patchwork of settlement areas and 'in-between zones', of built-up and open spaces, the former limits and clear interspaces between the single centres are not legible any more. Former outskirts of towns and villages have developed into a new blueprint of 'intermediate space', including all kind of differently built-up areas and open spaces: shopping centres and office parks, family housing estates and green voids, historical landmarks, traditional town centres as well as transitory places of our day-to-day mobility, such as transport stations, highways and railway tracks, but also regional attractions for leisure, sports and cultural events.

### The future of the city will be the city-region

The sketch by the British architect Cedric Price comparing the history of urban development with the forms of an egg makes it clear (Ill. 5): the former distinct logic of a ‘dominating’ centre and a ‘dependent’ periphery no longer applies to contemporary city-regions. The (historical) centres of our cities from pre-industrial as well as industrial times have lost their previous function as the focal points of the urban structure and as priority locations for civic life, jobs, services, culture and consumption. They have become a functional element just as many others within the large-scale structuring of the post-industrial agglomerations of today. At the same time, a multitude of new ‘centres’ and activity poles has emerged at the urban fringe – with different functional specifications, shape, formal or informal, permanent or ephemeral characteristics.



Ill. 5. ‘The city as an egg’ by Cedric Price (sourced from: <http://landscapeinspiration.tumblr.com/>. Accessed on: 10.01.2014)

### Loss of the centre = loss of the peripheries

In these extensive city-regions, the conventional opposition of city and landscape, of centre and periphery has dissolved: the landscape has become part of the city and the city part of the landscape, in a relation of mutual penetration and interdependence, as a city-regional continuum, which calls into question our conventional image and perception of ‘urbanity’ [18].

### Decentralised centralisation in Frankfurt Rhine-Main

As a polycentric region, Frankfurt Rhine-Main is characterised by a non-hierarchical network of larger, medium-sized and minor towns and centres that together build up a widespread system of decentralised centralisation (Ill. 4). Thereby, the densely woven historical settlement pattern of the region can still be recognized as the ‘genetic code’ or intrinsic logic of the city-regional structure up to this day. The multitude and diversity of the small and medium-sized municipalities is a specific feature of Frankfurt Rhine-Main compared to other metropolitan regions, and an important element of identification in a rapidly changing city-regional environment. Some of these centres have preserved a good deal of their outer appearance, and where these features have gone, there are often efforts to revive such characteristics, although, sometimes in a somehow superficial way.

### New centres beyond the centres

Beyond these traditional urban centres, at the periphery and in-between a pattern of new ‘centres beyond the centres’, which are relevant for our daily activities, has evolved within

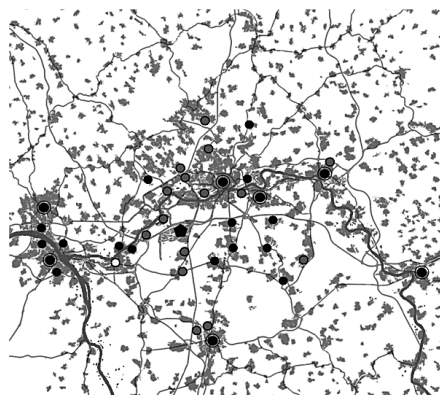
the larger context of the city-region [4, 13]. Peripheral centres have gained relevance and taken over functions that once were found in the city cores alone. In general, these new centres at the urban fringes are very well positioned with respect to the regional transport and road network.

### *Shopping and consumption at the urban fringes*

In the past, retail and consumption rated among the original functions and catalysts of the urban centres. Today, however, we can observe the relocation of important locations of consumption from the historical urban cores to the former periphery and the in-between zones (Ill. 6). For example, all along the highway ring around Frankfurt a series of shopping malls has been established, attracting large numbers of customers from all over the region because of their excellent accessibility by car and top-quality setting. Along the major regional thoroughfares, large-scale retail centres have been located, e.g., in the southern part of the city-region between Frankfurt and Darmstadt, in the east along the Kinzig valley, and towards the west, in the direction of Wiesbaden and Mainz. Some 15 kilometres west to Frankfurt, the Main-Taunus-Zentrum, a shopping mall with more than 80,000 square metres and some 4,000 free parking spaces is located in Sulzbach, a tiny municipality with just 8,800 inhabitants. Increasingly, leisure facilities, gastronomic and cultural attractions add up to the retail functions of these centres.



Ill. 6. Places of consumption in Frankfurt Rhine-Main (source: Bürklin and Peterek)



Ill. 7. Places of work in Frankfurt Rhine-Main (source: Bürklin and Peterek)

### *Service and business parks of regional significance*

In a similar way, places of employment have long since emancipated from the traditional central business districts and relocated to the regional in-between locations (Ill. 7). Business parks, office and service centres have established in the vicinity of the international airport and again along the major regional thoroughfares. The highest increment of job locations often takes place in rather small municipalities in between the larger centres, where sometimes the number of job places is higher than the number of inhabitants, e.g. in the municipality of Eschborn, close to the airport.

### *Places of leisure and recreational interest*

Last not least, places of leisure and recreational interest, including parks and green areas, historical and cultural sites, as well as an increasing number of locations for new sports facilities such as golfing and horse riding, are adding up to this network of attraction centres beyond the centres.

### **City-regional lifestyles and activities**

By the described developments, the focal points and activity poles of daily life – with regard to housing, jobs, leisure, education, commerce, and cultural activities – have spread over a wide and complex territory. More and more people develop ‘regional’ lifestyles and activity patterns, which are not longer confined to the boundaries of one single city:

“More and more people live in one place, go to work in another, do their shopping here and do their sports there, or go to a museum, a theatre, a cinema, a discotheque or a football stadium in yet another place. Apparently, they do not find any longer the quality of life they are looking for in one single city alone, or at least they do not want to rely on the options of one single city alone. As such a lifestyle implies a high degree of mobility, people enforcedly spend a lot of time ‘in-between’, on their way to somewhere, on the track. (...) Central is not any longer the geographical centre, not any longer the historical city centre, which is caught up in traffic jams, but possibly the well accessible areas at the urban fringe and in between the single cities” [8, p. 18].

The city-regional centres and activity hubs make different options and personal choices possible. They form the matrix for a range of individual day-to-day ‘biographies’ [3], which differ in space and time:

“There is the person who lives in the traditional 19<sup>th</sup> century inner city borough, but does his shopping in some peripheral retail centre, goes to the movies somewhere at a motorway junction and does his weekend mountain-biking nearby in the so-called ‘intact’ landscape at the urban fringe. On the other hand, there are the people who live in a suburban terraced house, work in a medium-sized city in the second ring, regularly visit the theatre in the central city and are members in a sports club in the neighbouring community” [2, p. 24].

### **The cycloregion**

In Frankfurt Rhine-Main former centres and former peripheries have broken down as traditional antipodes. Looking at the region, there are no more peripheries and no more centres, since both have become very much the same. Marc Augé’s dualistic model of the peripheral “non-places” as opposed to the conventional town centres [1] has become obsolete and no longer applies to such contemporary urban situations. Today, focal points of the city-region lie anywhere in the territory, i.e., in the old cores as well as far outside. What has come into being can be named the “cycloregion” [5, 6] as a place of interacting forces that are in a permanent change since they have to be competitive and always up-to-date. Hence, the cycloregion describes a network of power hubs and activity spots that compete with each other and at the same time support a shared and established field of cyclical renewal and regeneration.



## Challenges for city-regional planning in Frankfurt Rhine-Main

Which are the future challenges in Frankfurt Rhine-Main resulting from the described developments and how can planning give a support to a more sustainable enhancement of contemporary city-regions and specifically their manifestation as polycentric cycloregions?

### *A network of efficient (public) mobility*

The increased mobility requirements resulting from the expansion and dynamics of the city-region have to be dealt with by an efficient and integrated public transport system. It has become obvious that the priority which individual automobile mobility has had for several decades cannot act as a sustainable approach for the future. As daily movements on a larger scale are an immanent character and necessity of the cycloregion, public transport systems have to provide efficient links in between the widespread and dynamic network of centres, subcentres, and activity poles.

So far, in Frankfurt Rhine-Main the centre of Frankfurt has been in the focus of rail-bound public transport. All transport lines converged there in a radial form. In a polynuclear region, concepts for an increased number of tangential connections have to be developed in order to connect the different old and ‘new’ centralities and power hubs without the enforcement to cross Frankfurt city centre in every trip.

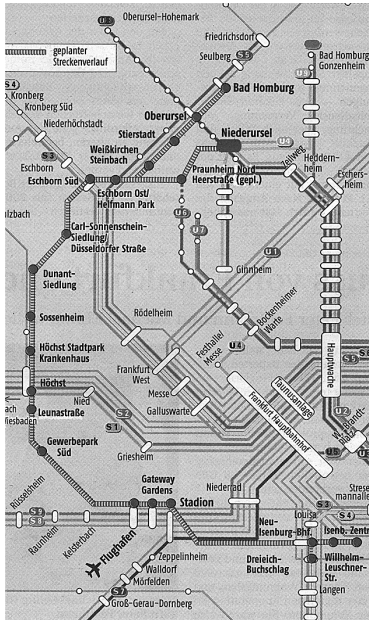
The projects of a new ‘North Main Interurban Train’ as well as the ‘Western Regional Tangent’, which should both be implemented before 2020, are developments dedicated to such an objective of a more ubiquitous, network-like extension of light rail traffic. The Regional Tangent West (Ill. 8), for instance, will then establish a new direct transport link between the densely inhabited centres of Bad Homburg and Oberursel in the north, the Northwest Shopping Centre, Eschborn Süd business parks, the technology park in Höchst, Frankfurt International Airport, and the centre and railway station of Neu-Isenburg in the south – an enormous improvement and gain in time for a large number of daily commuters who will then not have to do the long way around Frankfurt city centre any longer.

### *A mandatory link between future urban development and rail-bound public transport*

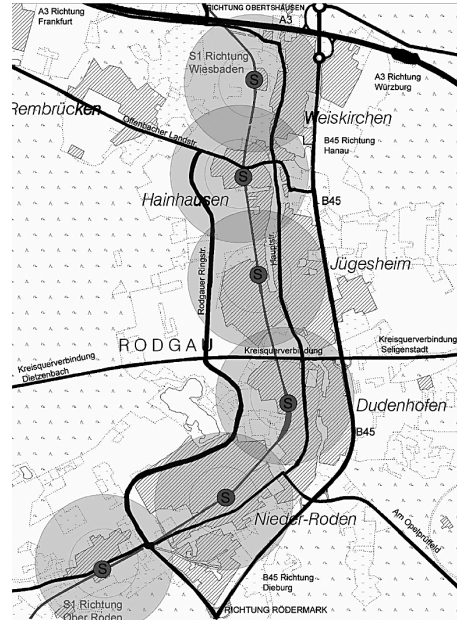
All future urban development in the region has to be linked to the rail-bound public transport system. As the Regional Land Use for Frankfurt Rhine-Main already stated in 2010, new urbanisation projects of city-regional significance should not take place without the basis of an efficient transport: “All further settlement activities should be coordinated with the operation and the extension of public transport infrastructure and specifically rail-bound facilities. New development projects should only be located within the catchment areas of the light rail train stations” [15, p. 46].

The linear urbanisation pattern in Rodgau, in the eastern part of the Frankfurt Rhine-Main region, is a good specimen of a planned development of this kind (Ill. 9): a central light rail spine connecting the communities from Weiskirchen in the north to Nieder-Roden in the south ensures accessibility by public means to all parts, while two lateral sides perimeter streets allow for the vehicular access to the centres.

The structural result resembles the “Metro-Matrix” model for a balanced long-term metropolitan and regional planning, recently published by Pedro Ortiz, the former planning director responsible for the Madrid Metropolitan Regional Plan [12].



Ill. 8. Project for the 'Western Regional Tangent' (source: Frankfurter Rundschau, 17.01.2014)



Ill. 9. Public transport based development pattern in Rodgau (source: Fachhochschule Frankfurt am Main)

### *A regional network of multi-functional centres*

The reduction of long commutes and unnecessary trips is among the most important objectives in the cycloregion. Therefore a 'region of short distances' has to be based on the development of compact poly-nuclear centres, districts and neighbourhoods, offering as much as possible facilities for everyday life. All developments have to make an effort to integrate functional diversity, including housing, jobs, services, education, culture, and leisure facilities, leading up to a city-region with less 'enforced mobility' [14].

Existing mono-functional areas should be enriched and 're-urbanised' by adding complementary utilities. Eventually, the isolated shopping mall may be supplemented with housing and office functions, as the basis for a diverse urban district is already there: shops, restaurants, services... And for their part, the existing just residential areas may allow new shopping and leisure functions to settle in their neighbourhood, possibly near to a public transport station, just to shorten the ways people need to make to meet their daily needs.

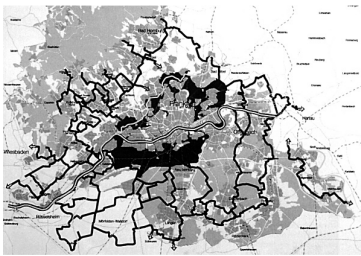
The Frankfurt-Niederrad business district redevelopment, today named 'Lyoner District', is a good example in this sense: a completely mono-functional office quarter of the past is under conversion into an integrated and mixed-use city district for 3,000 new residents. The proposed measures include the demolition of office blocks, the transformation of offices into apartment buildings, the construction of new housing facilities, the development of social and cultural infrastructure, of open spaces and parkland [11].



*Protection, continuity and connectivity of regional open spaces*

The heavy expansion of settled-in area in the last decades has lead to an almost continuous urban sprawl and splinter urbanism in different sectors, particularly in the densely woven pattern of minor and medium-sized urban centres along the Taunus foothills in the northwest part of the region. The result is a sequential loss of nature as well as the fragmentation of the still remaining open spaces with harsh consequences on the environment, on flora and fauna, as well as their use qualities for the inhabitants of the region.

The Regional Park project in Frankfurt Rhine-Main (Ill. 10) stands for a different approach to the urban and city-regional landscape in city-regions. Conceptually, it has a strong reference to the Emscher Landscape Park realised some 20 year ago on 300 square kilometres in the process of restructuring and revitalisation of the Ruhr Area. As a continuous and uninterrupted network of open space throughout the region, the objective of the Regional Park is to provide continuity and connectivity for leisure and recreational purposes, to link up with places of public interest including cultural and heritage sites as well as sporting facilities, and to provide climate and environmental protection in view of the competing development pressures on the cycloreion [16].



Ill. 10. Open space connectivity within the Regional Park (source: Planungsverband Ballungsraum Frankfurt/Rhein-Main (2004) Regionalpark Rhein-Main)



Ill. 11. City-regional landscape Frankfurt Rhine-Main (source: Bürklin and Peterek)

*Definition of communal interests and a 'common vision' for the city-region*

Compared to many other urban agglomerations worldwide, in its polynuclear structure Frankfurt Rhine-Main already brings about a series of base elements for a favourable prospect: a variety of day-to-day choices within the cycloreional pattern, a small-scale nexus of built-up and open space, an effective infrastructure, qualities of environment, natural spaces and cultural heritage as well as high economic potentials. Beyond the previously indicated challenges concerning the enhancement of public mobility, its linkage to a set of compact multi-functional centres, and the connectivity of regional open spaces, a definition and an agreement on communal interests as well as the development of a 'common regional vision' will be central prerequisites for a successful future. As the traditional duality between centres and peripheries has broken down, from now on they all share the same destiny. Dynamic cycloreions require stabilising parts – on an institutional level just as on the conceptual scale. Local communities as well as regional

institutions need a common mission statement, a vision for their future development to establish joint regional perspectives.

The studies for a regional 'International Building Exhibition' in the last years together with the bid for "OlympJA! Frankfurt Rhein-Main 2012" from 2001 have been first steps in the direction of a regional identity. Possibly the transfer of the city of Frankfurt's manifold endeavours to become an international Green City showcase [9] to a more comprehensive regional vision for a 'Metropolitan Green City Frankfurt Rhine-Main' could comport such a mutual commitment and mission statement for the future, showing up a model development of more energy-efficient and climate-protecting forms of urban living on a city-regional scale.

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