AMSTERDAM

IN A WORLD CITY NETWORK

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Contents

Prologue.

What we don't know about Amsterdam

Amsterdam, on its own or with its neighbouring cities as Randstad Holland, is one of the most studied cities in the world. The books and articles that have been devoted over the years to The Netherlands' premier city, if collected together, would constitute a sizeable library in their own right. Hence there should be very little we do not know about Amsterdam. In fact, of course, there is always much to learn that is new about this or any other great city. As the concerns of society as a whole change, so do the things we need to know about a city, to understand ourselves as citizens, and to inform the policy makers we vote for and employ. Currently key issues confronting modern society centre on the elusive concept of globalization. The first contention of this monograph is that the rise of a vigorously globalising world-economy has revealed that what we don't know about Amsterdam is very large indeed.

Where is this knowledge lacuna? Quite simply, we don't know very much about Amsterdam's relations with other cities across the world. At the very least, globalization is about transnational processes operating through numerous chains, circuits and networks in what Castells (1996) terms a new 'space of flows'. For the networks there are nodes or hubs, the most notable of which are the great cities which integrate their different regions and territories into a single world-economy. These cities have come to be known as world cities (Friedman, 1986) or global cities (Sassen, 2001). In a recent review of which cities are thus identified (Beaverstock et al., 1999), 10 out of 15 sources included Amsterdam in their listing of world cities (Table 1). There were four cities that all sources identified (predictably London, New York, Paris and Tokyo) but only six other cities with more mentions than Amsterdam. Thus, according to this literature at least, Amsterdam is a leading world city, a crucial hub in networks that constitute the contemporary world-economy. The point is that we know a lot about the nature of the hub that is Amsterdam – its internal processes – but relatively little about the nature of its links with other nodes.

If Amsterdam is indeed one of the important 'crossroads' of contemporary globalization it might be expected that we know how it relates to other great cities of similar importance. For instance, in this new globalising world-economy, what are the links and connections between Amsterdam and those European city neighbours with maximum scores in the review above, London and Paris? Are there hierarchical relations between these 'global cities' and Amsterdam as many writers assume, or do Amsterdam's links with other cities by-pass these important neighbours? What are Amsterdam's connections with the other two 'maximum score cities', New York and Tokyo? Does Amsterdam have more connections to the west or to the east and, in any case, what are they? What are Amsterdam's relations with less important world cities such as Shanghai, Johannesburg or Caracas? Surely Amsterdam has different intensities of contacts with these cities but what are they? In short, how is Amsterdam as a world city linked to other cities, both more and less important than itself, under conditions of contemporary globalization? The only researchers who have broached such questions are those investigating communication and transport infrastructures, notably airline networks, but their work tends not to be about the cities per se. In this monograph I focus on a specifically urban pattern of nodes and connections that I call the world city network and investigate Amsterdam's position, as a world city, within it.

Making a claim for there being relatively little knowledge about Amsterdam's external relations is quite a risky one to make, especially by someone like me who does not read Dutch. Despite the fact that much that is written on Amsterdam is available in English, my linguistic deficiency would appear to be the crucial factor in any supposed identification of a lacuna in the literature: it takes only a few pertinent writings to completely undermine my contention. And yet I do not think I am sticking my neck out for it to be chopped off by much more informed scholars of Amsterdam city. This is because I consider the knowledge deficiency I have identified to be a structural property of the nature of modern social knowledge. Thus it is not a particular feature of Amsterdam that I have pointed out. It is no good going to other cities, say London or Paris, to get a better understanding of how a particular city fits into our globalising world-economy. I argue that lack of knowledge about inter-city relations is an inherent trait in the production of knowledge by social scientists over the last century. Thus it might well be that we know more about Amsterdam's external relations in its seventeenth century golden age than we do in the twenty first century globalization age. Such an obtuse situation requires explication and that is where I begin this monograph.

Chapter 1.

Introduction: the taming of the city (modernity)

Why we do not know much about the relations between cities in contemporary social science is a fairly complicated argument which I have made in detail elsewhere. Here I am going to present my position as a series of propositions. Only very partially justified in this text, readers will have to go to other sources for the full arguments. However it is important that it is understood where I am coming from in this research: this detour is necessary before the focus returns to Amsterdam.

Proposition 1. **Living under conditions of modernity is to experience the opportunities and dangers of perpetual social change.** This is Marshall Berman's (1983) famous thesis which I use as my starting point. As modern men and women we experience the world as a maelstrom of new replacing old. Our task, both individually and collectively, is to try and ensure that we operate as subjects within this change rather than as mere objects of modern transformations. One important strategy to this end has been to create spaces to accentuate the opportunities and minimize the dangers of change (Taylor, 1996a, 1999a).

Proposition 2. **The key spatial strategy has been to place boundaries around social relations (containerization), thus facilitating a temporary taming of modernity within.** There are two examples of containerization relevant to my subject here. First, there is the territorial behaviour in modern politics that uses physical boundaries to control physical flows (of people, commodities, money) thus enabling design of a territory's character. This is the process that has created modern states. Second, there is the disciplinary behaviour in the modern academy that uses intellectual boundaries to control the flows of knowledge (of ideas, theories, concepts) thus enabling the design of a discipline's character. This has been the outcome of the intellectual struggles in the development of the organizational structure of modern universities. In both cases bounded spaces are being created to act as both a platform for taking opportunities and as haven from dangers (Taylor, 1999b).

Proposition 3. **"Society" is normally conceived as a people geographically bounded by the sovereign limits of a nation-state**. This is the result of the nationalization of the state in the nineteenth century in Europe. A mixture of states-begetting-nations and nations-begetting-states has led to a fusion of a political institution, the state, and cultural movement, nationalism, in the ideal of 'nation-state', the building block of the imagined communities that constitute our social world. It is this process that subsumed cities and their citizens into nations with a new broader definition of 'citizen' as 'nationality'. The geographical outcome has been a remarkable spatial congruence assumption where 'society', 'economy' and 'polity' are deemed to have exactly the same boundaries, those of the sovereign territory of the state (Taylor, 1994a, 1995a).

Proposition 4. **The social dominance of the nation-state ideal is directly reflected in the rise of social science**. This is where territorial and disciplinary containerization join together. The social sciences emerged at the same time as state nationalization and they were organized around the concepts of society, economy and polity. This allowed an unexamined geographical discourse to enter the very heart of social science; the core social science disciplines – sociology, economics and political science - have been unconsciously state-centric in nature. Thus social analyses have incorporated an embedded statism, privileging one geographical scale over all others in their theories and models (Taylor, 1996b, 1997a).

Proposition 5. **Embedded statism is expressed as a 'mosaic-metageography' that dominates the way the world is routinely perceived at the global scale**. Metageographies are the taken-for-granted spatial structure by which we order information about our social world. Currently this is represented by the world political map of states which appears on every geography schoolroom and is by far the most familiar of all human geography maps. It is sometimes said the lines on the map which depict state boundaries (usually red lines) appear to be as natural as rivers (blue lines) and coasts (black lines). In this case, the embedded statism of our modern world is expressed as a mosaic structure of space, above all, a space of places rather than a space of flows (Taylor, 1994a, 2002a).

Proposition 6. **States are the great producers of publicly-accessible evidence on all social activities which is why the results are called stat-istics (albeit without the hyphen!).** Our social world is described by states for state purposes. Whether UN statistics at the

international scale or local statistics at the sub-national (regional or urban) scale, state agendas are intrinsic to the information gathered (Taylor, 1996b, 1997b).

Proposition 7. **As territorial political entities, states are largely interested in 'taking stock', counting their populations and resources in state-defined spaces**. This means that the vast majority of publicly-accessible data provide attribute measures of areas to the relative neglect of measuring the relations, connections and flows between areas. We are provided with masses of information to describe and analyse spaces of places, but relatively little for serious consideration of spaces of flows (Taylor, 1999c, 2002a).

Proposition 8. **If states have been the taken-for-granted subject of mainstream social sciences, cities are the neglected subject**. Research on cities appears under the label 'urban studies' which is most notably NOT a discipline in social science. When this knowledge is disciplined 'urban' is relegated to an adjective as in 'urban geography'. Although there has been a rich tradition of 'urban sociology', there has been much less 'urban political science', and 'urban economics' is largely conspicuous by its absence. Cities as subjects are neglected and distorted through disciplinary containerization (Taylor, 2002b).

Proposition 9. **Despite the *raison d'etre* of cities being their connectivity, there is very little data on relations between cities**. State census volumes focus upon the cities as places in which to take stock, not as the crossroads of society. Hence, although there are numerous references to relational concepts such as city networks, urban hierarchies and city systems in the urban studies literature, the evidential basis of these ideas has been limited. Cities as objects are 'de-networked' and truncated through stat-istics in territorial containerization of knowledge (Taylor, 1996b, 1997b).

Proposition 10. **The most prominent city-related concept in social science is 'urbanization', a stock-taking areal concept eminently suited to stat-stical description.** To view the growth of cities in a simple areal manner is the ultimate degradation of the city as a crossroads in a wider world. Instead it is represented as an essentially local problem, the 'invader' of rural idylls. We need to think, in Murray Bookchin's (1995) terms, of 'cities against urbanization': stat-istics have promoted anti-city ideologies (Taylor, 2002b).

Proposition 11. **Where cities are conceptualized in relational terms they have, until recently, been geographically truncated as 'national urban systems'.** This nationalization of cities has removed connections beyond the state-space from the city-system analysis. Classically theorized as 'primate-city' distributions and 'rank-size city systems' on a state-by-state basis totally downgraded, if not willfully ignored, relations beyond the state boundary. Primate cities were found to be the most common pattern and the fact that such cities were invariably a state's chief port connecting the country to the rest of the world seems largely to have been over-looked. In general, cities and their relations can only be geographically truncated under absolutely autarkic state conditions (Taylor, 1996b).

Proposition 12. **Contemporary globalization is a threat, not so much to the state per se, but to the mosaic metageography, to territorial containerization.** The enhanced permeability of political boundaries has opened up new opportunities for cities in a world space of flows of information and knowledges. In the past the concept of 'world city' was limited to one or just a few major metropolitan areas, but in the last two decades the combination of communication and computer technologies has resulted in the rise of a world city network encompassing very many cities across the globe (2002a).

Proposition 13. **However, we can now understand that for studies of a world city network there will be a veritable evidential desert.** This is because data on relations between world cities suffers from a 'double whammy', a state-centric data bias complemented by an attributional measurement proclivity. It has been shown that the evidential structure of the world cities literature includes very little on inter-city relations. Despite much reference to networks, hierarchies and systems of cities at a global scale, in fact we do not know much about how world cities connect with one another (Taylor, 1999c)

Proposition 14. **Because, in part, of globalization, social knowledges are more fluid today than for several generations: old social science boundaries can no longer contain understanding of social change.** Knowledge fluidity means porous disciplinary boundaries: this is not a time for building disciplines rather eclectic 'fields of knowledge' are becoming the norm. Quite simply, the unexamined statism of 'mosaic social science' is coming to an end. Now there is a vibrant debate on the importance of states so that studies at the state scale have to justify that choice. There is thus the opportunity of building new social knowledge,

perhaps ‘network social science’ with new fields such as a de-territorialized, global urban studies (Taylor, 1997a).

Proposition 15. **Despite its many failings, the world city literature with its emphasis on worldwide connections most certainly does point us beyond both territorial and disciplinary containerization.** Given that we need a new transdisciplinary framework to better understand transnational processes under conditions of contemporary globalization, then there is probably no better place to start than with research on world cities.

Chapter 2.

The world city network project

The Globalization and World Cities (GaWC) Study Group and Network has been set up at Loughborough University (UK) to help facilitate world cities research. It operates as a virtual centre (www.lboro.ac.uk/gawc) providing three main facilities for world city researchers. First, GaWC encompasses a large multi-institutional research programme. This consists of world city projects carried out in Loughborough and with collaborators elsewhere. Projects come in all shapes and sizes using a variety of methodologies: of the seven major projects, 4 use qualitative methods and three are quantitative and analytic. Second, GaWC provides an immediate clearing house for world city research papers derived from the projects as GaWC Research Bulletins, a service also available to all world city researchers who wish for rapid exposure of their pre-publication papers. Third, GaWC provides a repository for data on world cities: these GaWC data bases provide a unique set of inter-city data matrices. This is GaWC's modest contribution to weakening the stranglehold of stat-istics in macro-social science.

The research on Amsterdam I report below is derived from one of the quantitative research projects funded by the Economic and Social Research Council of the UK. Entitled "World City Network Formation in a Space of Flows", this project attempts to provide a systematic description of the world city network as it existed in the year 2000. In this report I extract some of the general findings of this work as they pertain to Amsterdam and carry out new analyses of the data focusing on Amsterdam. Since the Amsterdam analyses are totally new there is nothing against which the findings can be compared. Therefore I have created two 'city peer groups' on which the same analyses are carried out. These are a local peer group and a global peer group; the basis for selecting membership of each is given in chapter 4. At this stage there are two parts of this project research that need to be reported: specification of the world city network and how we went about constructing data to describe it.

Specifying the world city network

Although there are many references in the world city literature to relational concepts such as 'world city hierarchy' or 'global urban system' there have been no precise specification of what the relations between the cities actually consists of. Rather we have general concepts instilling an imprecision of thought that makes measurement impossible except at an equivalent level of inexactness. Thus the first step in the project on the world city network has been to specify precisely what we mean by our preferred relational concept. What sort of network are we studying and how do the cities relate one to another?

The world city network is defined as an interlocking network, a type of network relatively rare in social science research (Taylor, 2001). This is because most network analysis has just two levels of action, the level of the individual node and the level of the network as a whole. An interlocking network has a third sub-nodal level. The triple level network we study here consists of a network level at the scale of the world-economy, a nodal level at the city scale, and a sub-nodal level at the scale of the individual firm. The latter are advanced producer service firms who provide financial and business products and advice to transnational corporations and governments across the world. Thus we develop a conception of the world city network as the inter-connected service centres for global capital. Let us consider each level in turn beginning with the lowest and most basic.

The service firms in this specification are specialised producers of knowledge-based products that require them to be located in strategic locations across the world. Inter-jurisdictional law, international investment portfolio management and the advertising of 'world brands' are all examples of activities that require very specialised creative and professional knowledge to provide the business service. In the last two decades, many large service firms who previously had been single-city based, such as law partnerships, or single-nation based, such as advertising agencies, have 'gone global'. Initially service firms were 'followers' in the globalising process. That is to say, their important clients had become transnational and therefore needed servicing in different parts of the world. In these circumstances, any service firm that did not expand their geographical reach in response to their client's new needs faced a likely loss of a prized contract. Subsequently some service firms have developed their own global strategy by going into new regions in search of new clients. Either way, it is clear that

there has been a spectacular rise in 'global service firms', themselves large transnational corporations, servicing the specialised needs of other transnational corporation in all corners of the world. These are the sub-nodes in the network.

Global service firms do not locate their offices anywhere. Although new communication and computing technologies allow for decentralisation of many business service functions, this is not the case with the very specialised creative and professional knowledge products that global service firms provide. In order to be at the cutting edge of their knowledge sectors these firms require knowledge–rich environments, dynamic places where ideas, information and knowledge are forever being subsumed (learned) and created (unlearned). World cities are the privileged sites where such 'economic reflexivity' takes place for the service products described previously. All service firms with pretentious to providing a 'global service' to their clients have to be located in world cities. Thus the latter are the nodes in the network.

Finally there is the network level itself, the world-economy. The serious players in the world financial and business service market provide a 'seamless service' to their clients. Since the world-economy is not a homogeneous playing field, firms need to locate offices in all countries and regions where clients operate. Initially some firms coped with the international needs of their clients by making arrangements with other local firms in other cities and countries. Such 'correspondent' links, loose alliances, and other ad hoc arrangements incorporated with them an inability to ensure quality control. Since provider-client relations are at the heart of all services, a let down in the service provided can undermine the relationship and the client may go to a rival firm. Hence the importance of developing and maintaining a branding for products that ensures their quality. Seamless service, where in-house teams are brought together from across the world on a client's project, leaves no chance of an outsider malfunction. Thus the need for global strategies, a network of offices in all the strategic places that combine reflexive and geographical knowledge. For instance, most global service firms will want to be located in Hong Kong because this is where geographical inside knowledge of the growing Chinese market and the Chinese government intersects with globally functional creative and professional knowledge. A joint building venture in China by Australian and German construction companies would likely be serviced, in say law, through a firm's Hong Kong office with practitioners flown in from Sydney and Frankfurt to make up the project team. This is the level of the network itself.

In this specification the world city network consists of the amalgam of all the office networks of global service firms. A depiction of a miniscule section of this network is shown in Figure 1. Lines connect cities where a firm has offices in both locations. Every line defines a connection – a city dyad - through which a firm can produce a seamless service. The format for indicating these relations is the basic matrix defined by m firms and n cities. The cells of this matrix are filled by x_{ij} that define the 'service value' of $city_j$ to $firm_i$. This service value - how important a city is within a firm's global strategy - will be shown by such features as the size of its office and the functions it performs. The basic matrix corresponding to Figure 1 is shown in Table 2. The point is that the more important the office, the more flows of ideas, information, knowledge, instructions and people will emanate from that city. Thus for example, a city dyad where both cities have large service values can be expected to generate larger intra-firm, inter-city flows than a dyad where both cities have low service values: for instance, in Table 2 we would expect the largest flows within the Dresden Banking Group to be between Frankfurt and New York. This basic matrix can be used to develop a simple mathematical specification of the world city network – see Taylor (2001). All that is necessary here is an appreciation of the specification as shown in Figure 1 and Table 2. This is, in fact, a codification of the classic world city skyline of expensive high-rise offices where the global servicing of capital takes place. The key, however, is not in the architecture of glass and concrete but in the less visual but massive numbers of connections (e.g. emails, face-to-face meetings, etc.) that these office blocks generate.

This is termed an interlocking network because the nodes (cities) are interconnected through the sub-nodal level: the firms are the 'interlockers' of the network. This makes global service firms the prime producers of the world city network. The political and policy implications of this specification are therefore quite profound and we return to discuss this after the empirics in chapter 6. For now the next stage is to operationalise the specification.

Constructing the operational data matrix

The advantage of a precise specification of the network is that it directs the information gathering and data production. In this case the basic matrix has to be empirically defined to produce the operational data matrix for analyses (for a more detailed description of this process than found below, see Taylor, et al. (2001a)). In other words we have to produce

estimates for each x_{ij}, the service values in the matrix. This requires finding the global locational strategy of advanced producer service firms.

Fortunately leading service firms are not at all reticent in providing information about the locations and functions of their offices. This is for two reasons. First, their global scope is an important part of the service package they have to offer potential customers. Second, their global scope is an important attraction to new recruits: as knowledge production firms they need to appeal to the best new brains in their professional/creative labour markets. The result is that the web sites of firms provide nearly all the information we need. Thus the data described below is largely based on information from firms given on their web sites supplemented by other material where available (e.g. internal firm directories).

Given this information gathering approach, the next step is to choose the firms. We approached this sector by sector using published lists of the largest firms worldwide. Firms were then selected as follows. First there was a pragmatic consideration – do we have appropriate information from a firm's web site? This was nearly always the case but incomplete coverage of all world regions – for instance, with a site under reconstruction – would disqualify a firm from this study. Second, firms must be clearly global in their coverage. We defined global as having offices in at least 15 different cities of which there must be at least one in northern America, in western Europe and in Pacific Asia. Third, we wanted to allow the possibility of making inter-sector comparisons and therefore we restricted consideration to sectors where we could find at least ten firms qualifying on the other criteria. The end result of this selection procedure was a list of 100 firms – the "GaWC 100" – in six sectors: 18 in accountancy, 15 in advertising, 23 in banking/finance, 11 in insurance, 16 in law, and 17 in management consultancy. These are listed in Appendix A.

The selection of cities was much more straightforward. We wished to cover cities from across the world and, appreciating the fact that it is not just the commonly identified world cities that are globalising, we decided to select more cities than is usual in the world cities literature. Thus we selected the capital cities of all but the smallest states and a range of other important cities based on initial experiments with the web sites. The end result was a list of 316 cities. These are listed in Appendix B.

The information gathered for the offices of each firm in each city was two-fold. First, we collected information on the size of a firm's presence in a city. The ideal measure was number of practitioners in a city office (common for law firms) but other measures were used such as number of offices (common in banking/finance). Second, we collected information on the extra-locational functions of offices in a city. These were usually hierarchical features such as group headquarters or regional offices. The end result was a mass of information which varied greatly from firm to firm.

Converting this multifarious information into comparable data across cities and firms required a data construction method to produce the necessary estimates of service values. It was decided to devise a simple 6-point scale from 0 indicating no presence of a firm in a city to 5 indicating the most important office of a firm (i.e. its headquarters). The method was to assume that a firm's presence in a city scored 2 unless there were reasons to lower to 1 (e.g. no qualified practitioners) or raise to 3 (e.g. particularly large office) or to 4 (e.g. exceptional extra-territorial functions). The end result is an operational data matrix of 100 firms x 316 cities where service values range from 0 to 5. Each column in the matrix is a codification of a firm's global office strategy, each row is a codification of a city's global service mix or profile. This is the basic input to all the analyses below.

Chapter 3.

Amsterdam in the configuration of the world city network

Before we begin to look at the details of how Amsterdam is connected into the world city network it is important for the reader to understand the configuration of this network. By configuration I mean the pattern of cities, which are alike and which are different, as revealed by the service values of global service firms. Because this research is very new there is no general appreciation of how world cities relate to one another on a global scale. In this chapter we provide a preliminary analysis of the operational data matrix and highlight the position of Amsterdam in that configuration.

The initial operational data matrix holds 31,600 pieces of data. This large matrix is very sparse in parts because many of the cities have only a very few presences of our global service firms (in fact 3 of the 316 cities recorded no presences for the GaWC 100 firms). As indicated in the last chapter, selection of cities was much less rigorous than selection of firms. It was expected that not all cities would be relevant to subsequent analysis and it is most certainly the case that we need to reduce the level of sparseness in the data to produce meaningful results. Thus the first step in any analysis of the operational data matrix is to decide on the number of cities to study. In the analyses reported below we have used 123 cities. These are listed in Figure 3 in which they are depicted as an ‘archipelago’ of cities across the world. The selection criterion for these cities is taken from the connectivity measures described in the next chapter. Basically we chose those cities with at least one fifth of the network connectivity of London, the most connected city. This produces a revised operational data matrix that still includes a lot of data (12,300 pieces to be exact) but which is appreciably less sparse than the data matrix from which it is derived.

There is a family of techniques that are available to researchers confronted by a very large data matrix. These are the factor analytic group of techniques that search for the underlying dimensions within a data matrix. The end result is a parsimonious solution whereby the data is transformed into just the main dimensions of variability in the matrix. Principal

components analysis is the simplest of these techniques and this is employed here to find the basic configurations in our data.

Principal components analysis focuses upon the similarities between cities in terms of their service value profiles. Each row of the matrix is correlated with every other row to show similarities in service mixes between pairs of cities. These correlations are then used to derive new composite variables (principle components) that are based upon clusters of cities with similar service value profiles. The relationship between the original variables, the city service profiles, and the components is given by the 'loadings' which measure the correlation between the two. Thus if a city has a high loading then it means that its city service profile is an important contributor to the new composite variable or component. Components are thus interpreted by the variables with high loadings, in this case by high loading city service profiles. This means that the components are, in effect, clusters of cities with similar service profiles. In the analysis of the 123 cities x 100 firms data matrix we look at all loadings larger than 0.4.

In carrying out a principal components analysis several decisions have to be made. First, there is the model to be used: we employ a principle axes extraction and varimax rotation. This provides for very distinct definitions of independent clusters. Second, we have to decide on the number of components to interpret. There is no simple way to make this decision, here we have identified the most clear-cut pattern of large clusters of cities (for more details, see Taylor (et al., 2001b) where the solution described below is termed the 'primary structure in the data'). This solution is particularly appropriate for the purpose of delineating the basic configuration of the world city network. In this way the analysis reduces the original 123 city profiles to just 5 components representing composite city profiles.

The global configuration of the world city network is shown in Table 3. The five clusters of cities are quite distinctive. The "Outer Cities" cluster brings together cities that are largely beyond the main globalization arenas (northern America, western Europe and Pacific Asia): these are service profiles that feature the firms (largely in accountancy but also in advertising) that have the most widespread global strategies. The "US Cities" cluster shows that cities from this country are generally quite distinctive in their service mixes with a concentration of US headquartered companies across all sectors. The "Pacific Asian Cities" cluster is equally

geographically focussed this time largely featuring banks in the service profile. The “Europe-Germany Cities” cluster is where we find, as would be expected, Amsterdam. However note its relatively low loading: this cluster is dominated by German cities with service profiles in which German banks feature prominently. Finally there is the unexpected fifth component that brings together an “Old Commonwealth Cities” cluster, a historical politico-cultural dimension that remains important. One thing to notice about these clusters is that. with the exception of Tokyo in the Pacific Asian cluster, the major cities associated with each cluster have relatively low loadings: see Los Angeles and Chicago loadings on the US city component, New York does not even make the 0.4 threshold; London has a relatively low loading on the Old Commonwealth city component and Sydney and Toronto do not reach the 0.4 threshold; and Frankfurt loads behind all but one other German city and Paris is not prominently featured in the European-German city component. Thus it is the relatively minor world cities that pick out the distinguishing features of the composite city profiles we have identified. Since Amsterdam ranks as a major world city this is another reason, as well as not being German, why is does not feature prominently in its own regional cluster.

This is how the world city network is broadly configured. It can be interpreted as a sort of spatial skeleton of globalization. The configuration is strongly regional through explicit identification of the three main globalization arenas, plus a worldwide politico-cultural category and an outer arena category. The low loadings of most major world cities implies that their service profiles are much less contained than the cities featuring strongly in the regionalised city clusters. Amsterdam is just such a city.

Chapter 4

The Network Connectivities of Amsterdam

Defining the configuration of the world city network has not explicitly dealt with the connections between cities. Statistical relations between cities have been measured by correlations of service profiles not by looking specifically at connections within the office networks of different firms. The operational data matrix can be used to derive such measures of connectivity which, when amalgamated, provide global network connectivity estimates for all cities in the data. This chapter focuses upon such measurement.

In order to aid interpretation of Amsterdam's connectivities we use two peer groups for comparison. First, there is a local peer group of Benelux cities that appear in our top 123 cities: Brussels, Luxembourg, Rotterdam and Antwerp. Second, there is a global peer group which is much more difficult to compose. Clearly the cities have to be major world cities like Amsterdam but not the 'big four' of London, New York, Paris and Tokyo. We need 'second tier' cities and a reasonably geographical spread. For the latter we use the main globalization arenas as identified in Table 3. Three cities are chosen that, like Amsterdam, do not feature too prominently in their regional clusters: Chicago, Singapore and Frankfurt. Brussels doubles up as another member of this group but its role in the EU makes it a special case (it does not reach the 0.4 threshold for any cluster in Table 3). In all subsequent analyses Amsterdam will be compared to cities in these two peer groups.

The Global Network Connectivity of Amsterdam

Global network connectivity can be computed for every city in the data as follows. For Amsterdam, take Firm 1 (the first column in the data matrix) and compute the product of Amsterdam's service value with that of every other city's service value for this firm. The sum of these products provides an estimate of this firm's contribution to Amsterdam's global network connectivity. Repeat for all other 99 firms. The aggregate of these 100 sums of products defines Amsterdam's global network connectivity as 37, 414. Interpreting such large connectivities is eased by presenting them as proportions of the highest global network

connectivity, that of London. In this measure Amsterdam's connectivity is 0.5901 or approximately three fifths of London's connectivity.

Table 4 puts Amsterdam's connectivity in perspective showing it ranking 12th among all world cities. In comparison with its global peers Amsterdam is less well connected than Singapore and Chicago but better connected than Frankfurt and Brussels. The other local peers (i.e. other than Brussels) rank relatively low in terms of connectivity with under one 3rd of London's level. To indicate the sort of cities the local peers are like in terms of network connectivity, neighbouring ranks are shown in Table 2. These results confirm Amsterdam as a leading city in the world city network. Clearly far behind London and New York, Amsterdam fits into the second tier of world cities above important cities such as Sao Paulo, San Francisco and Zurich. Locally, the only serious rival is Brussels. Although these results are not in themselves surprising, this is the first time Amsterdam's position among world cities has been placed upon an empirical basis that is both comprehensive (cf. the GaWC 100) and rigorous (cf. the specification).

Decomposing Network Connectivities

Once you have an aggregate measure such as global network connectivity you can decompose it in different ways. Here we present two interesting divisions, by sectors and by dominance.

The data consists of firms from six different service sectors and therefore the connectivity of every city can be divided into six parts, one for each sector. Table 5 shows the proportions of connectivity produced by firms in each sector for Amsterdam and the peer group cities. In addition average proportions by sectors for the 123 cities of the revised operational data matrix are provided as a sort of 'world city mean' for initial comparison.

First, comparing Amsterdam to the mean proportions for world cities it can be seen that the city is about average for banking and insurance, above average for advertising, law and management consultancy, and clearly below average for accountancy. How far is this profile typical for cities of this rank? Looking at the global peers it can be immediately seen that Amsterdam's connectivity is less from banking, and possibly insurance, than might be

expected. On the other hand its advertising proportion is the highest reported in the table. Finally it should be noted that Amsterdam's below mean accountancy proportion is actually high compared to its global peers. We can see from the local peers that this most geographically-dispersed of sectors generates particularly high proportions of connectivity for minor world cities. This leads to a situation where proportions for the three minor world cities are lower in nearly all other sectors than for Amsterdam. The exceptions are Luxembourg's banking connectivity, and insurance connectivity for both Luxembourg and Rotterdam. The latter has the highest proportion for insurance in the table which reflects its sea trading tradition from whence global insurance originated. The one other noteworthy point concerns the most geographically-concentrated sector, law. Although Amsterdam's law proportion is very high relative to the general mean it is still far below Frankfurt and Brussels with their important financial and governmental legal attractions respectively.

In summary, Amsterdam's sector profile in terms of its connectivities is fairly typical for its rank but with less than expected banking and more than expected advertising. It is not typical of the local Benelux world cities having a more widespread source of connectivities than its neighbouring minor world cities.

The global network connectivities can also be divided in terms of the relative nature of a city's link with other cities. Every connection within a firm between one city and another city can be allocated to one of three groups. The city can have a higher service value than the other city: we call this a dominance connection. Alternatively, the city can have a lower service value than the other city: we call this a subordinate connection. Finally, the city can have the same service value as the other city: we can call this a 'neutral connection'. In Table 6 the aggregate dominant and subordinate connections are shown for Amsterdam and the peer group cities. These measures show a clear difference between the global and local peer groups and in this case Brussels fares particularly poorly in terms of dominance relations. This is shown by the ratios between the two sources of connectivity. Here Amsterdam looks typical of its global peers. Clearly Frankfurt's dominant connections and ratio are very impressive but Amsterdam compares well with the other three global peers.

In summary, Amsterdam is clearly similar to its global peer group and equally clearly it is far more dominant in the world city network than its local peer group, including Brussels.

Chapter 5

Amsterdam's hinterworld

Cities have traditionally serviced their hinterland (otherwise known as urban field, umland, sphere or zone of influence, and tributary or catchment area (Johnson, 1967, 81)). In the past much research effort has gone into defining hinterlands, seeking the boundaries for where a city's servicing expires. And, of course these still exist: city newspapers have areal limits to their routine sales and city retail stores have maximum distances over which they will deliver purchases. But under conditions of contemporary globalization there is another sphere of servicing. Instantaneous communication combined with computer software has enabled some services to be delivered worldwide as previously described. Thus world cities, while continuing to have their local and regional hinterlands, are sites for providing new services across the world. These activities by global service firms create what I term a city's hinterworld (Taylor, 2001b).

Unlike hinterlands, hinterworlds do not have boundaries. In our analyses of 123 world cities, every city is connected to every other city through the GaWC 100's office networks. Since city hinterworlds all cover the same global space, they differ in terms of the distribution of the intensity of their connections across the world. Of course, the original hinterlands are typified by uneven service provision usually depicted as decline in service with distance from a city. In the case of hinterworlds distance need not be a critical factor. With the costs of electronically moving information and knowledge around not related to distance, these direct economic effects of distance have been largely eliminated. However distance may have an important effect on service provision where historical and cultural linkages remain important to a firm's business. Whether this is the case for world cities under conditions of contemporary globalization can only be ascertained empirically. It is the task of this chapter to describe Amsterdam's hinterworld and compare it to the hinterworlds of the local and global peer group cities.

Measuring Amsterdam's Hinterworld

To measure a hinterworld it is necessary to estimate the service that the global service firms within a city can provide for clients serviced through every other world city. This is done as follows using Amsterdam as the example (for a general and more detailed description of the methodology of this chapter see Taylor (2002c)). First, identify the n firms from the GaWC 100 that have a presence in Amsterdam. In this case n = 70. Second, taking each other city in turn, identify the 70 Amsterdam-located firms in each city. For each city, sum the city's service values of the 70 relevant firms. This provides a gross measure of the service for Amsterdam-located firms to be found in another world city. Third, divide each city sum by the maximum possible service that could be provided in other cities. This is given by the 5 x n, that is where there is a maximum score in the other city for every Amsterdam-located firm: in this case the maximum total service value is 350. Thus if city X has all 70 Amsterdam-located firms each with service values of 2, then the service level provided is (70 x 2)/350 = 0.4. A higher provision is provided by city Y where half the Amsterdam-located firms have service values of two and half have service values of 4 producing a level of service at 0.6. This contrasts with city Z only housing 35 Amsterdam-located firms all with service values of 2 which gives a service provision of only 0.2.

When calculating real provision levels for Amsterdam-located firms, the scores range from 0.77 for London and 0.69 for New York down to 0.11 for Pittsburgh, Kuwait and Indianapolis. This means that clients being serviced through offices in Amsterdam can expect a very high quality of service when their business takes them to London but they should have low expectations for business in Pittsburgh. The latter's low score is because Pittsburgh has no presence for many Amsterdam-located firms. Nevertheless, there are connections within office networks of Amsterdam-located firms to Pittsburgh and all other world cities showing that Amsterdam's hinterworld is indeed worldwide.

Amsterdam's hinterworld as defined above is depicted in Figure 4. There are high scores in all three prime globalization arenas: northern America, western Europe and Pacific Asia. The low scores are found predominantly among the previously identified 'outer cities' (Table 3). Although some of the smaller cities in the USA and Europe are well represented, to a large degree what this map depicts is the overall pattern of global network connectivity of cities.

We have already noted London and New York having the two highest scores, it is also the case that all the cities listed in the top twenty for connectivity in Table 4 feature with high scores in Figure 4. Thus, the hinterworld of Amsterdam directly reflects the global network connectivities of cities. This will be true of all other cities, London and New York will always provide the highest two scores because they have by far the highest connectivities of world cities. This result is, of course, highly plausible but is not very helpful if we wish to compare the hinterworlds of different cities.

Comparing Amsterdam's Hinterworld

We use a simple linear regression model to remove the general influence of global network connectivity from Amsterdam's hinterworld. This involves regressing the hinterworld scores for Amsterdam against the global network connectivities of the other 122 cities. In other words we treat network connectivity as the independent variable and the hinterworld scores as the dependent variable. This provides a regression equation that predicts what the Amsterdam hinterworld score should be for a city given that city's level of network connectivity. Differences between the actual hinterworld score and the predicted score defines a residual. These are what we use to compare Amsterdam's hinterworld with those cities in the two peer groups.

The relationship between Amsterdam's hinterworld scores and the network connectivities is a very close one so that most residuals are near zero. This is indicated by a standard error of estimate of only 0.017. However, residuals that depart significantly from zero are easily interpreted. Large positive residuals show that there is appreciably more service provided in a city than would be expected from that city's level of network connectivity. Conversely a large negative residual indicates less than expected service provision in a city relative to its network connectivity. In other words the residuals show where Amsterdam's hinterworld is particularly strong and where it is notably weak relative to the common pattern of global network connectivity.

Amsterdam's hinterworld as represented by residual scores is shown in Figure 5. The pattern is a quite clear one: the hinterworld is particularly strong in Pacific Asia, and to a lesser extent in a small central zone in Europe, and it is particularly weak in northern America. This

pattern is difficult to interpret on its own – is such a hinterworld typical of other major world cities or, less likely, of other local Benelux world cities? To answer these questions hinterworlds based upon residuals have been constructed for all cities in both peer groups.

Before viewing these comparative maps it is worth briefly considering the standard errors of estimate of the peer group cities. These are shown in Table 7. It is immediately clear that the three minor Benelux world cities have far larger standard errors than the other cities. This indicates that they will have a wider range of residuals – on a scatter diagram the points will be dispersed in a broader distribution along the regression line. We interpret why this should be the case below. The importance of pointing this out here is that a choice has to be made on the intervals to be used in mapping the residuals. It is common to express residuals in units of the standard error so as to compare the relative statistical significance of residuals. However, in this comparative exercise the absolute sizes of residuals is important in showing differences between minor and major world cities. Therefore, the same interval scale for residuals is used on all hinterworld maps discussed below.

Beginning with the major world city peer group, Singapore's hinterworld (Figure 6) is similar to Amsterdam's (Figure 5) with its main strength in Pacific Asia and with a lesser central zone in Europe but there is not the same negative concentration in northern America - European and Middle Eastern cities are equally represented as 'under-providing' services. Frankfurt's hinterworld (Figure 7) has the same positive pattern but with the two zones reversing their roles: the European central zone expands and dominates, with Pacific Asia the lesser region. Strong negative residuals are found in northern America in this case but they are not as concentrated as with Amsterdam. Chicago's hinterworld (Figure 8) is completely different with 'over-provided' servicing almost completely restricted to northern America. The negative residuals are concentrated in Europe and in this case Pacific Asia hardly features at all. In short, for a major world city Chicago hinterworld is remarkably local. This is brought home very clearly in comparison with the other Benelux major world city, Brussels. This city has the smallest standard error in Table 7 which is reflected in a quite sparce hinterworld as defined by residuals (Figure 9). There is a slight positive concentration in Pacific Asia but otherwise Brussels' hinterworld is sporadic and dispersed across the world.

What does this peer group tell us about Amsterdam's hinterworld? Clearly Amsterdam is not unique with its over-provision of service links in Pacific Asian cities and, to a lesser extent, in a European central zone. But the very strong negative concentration in northern American cities has not been fully replication by the other major world cities.

Turning to the minor cities in the local peer group, we get fuller expressions of hinterwords given the higher standard errors in Table 7. Luxembourg's hinterworld (Figure 10) illustrates this point well. However the main feature here is the repetition of the dominant European central zone, as shown for Frankfurt (Figure 7), contrasting with an enhanced version of Amsterdam's concentration of negative residuals in northern America. In this case the Pacific Asian concentration of positive residuals is hardly discernable. Luxembourg's particular feature is the inclusion of major and minor financial centres for over-provision: Hamilton (Bermuda), Nassau (Bahamas), Panama City, Port Louis (Mauritius) and Manama (Bahrain) all feature in this hinterworld. Rotterdam's hinterworld (Figure 11) has a distinctive pattern in which northern America and western Europe both feature prominently with cities of service over-provision and Pacific Asia is a concentration of negative residuals. The remainder of the negative residuals are spread across the rest of the world and include major cities in the USA (including New York) and Europe. For the latter, the zone of positive residuals is more 'western' than previously seen (including London). Finally, Antwerp's hinterworld (Figure 12) is the most local with cities across Europe dominating the pattern with their large positive residuals. In this case the concentration of under-provision of services in Pacific Asia noted for Rotterdam (Figure 10) is also accentuated. Positive and negative residuals are mixed in northern America again a little bit like Rotterdam's pattern.

What does this peer group, when limited to its minor world city members, tell us about Amsterdam's hinterworld. First, it confirms that the latter's under-provision in northern America is not unique but is a feature of other European cities' hinterworlds (cf. Luxembourg). Second, the over-provision in Pacific Asian cities seems to be a feature of major world cities (excepting the case of Chicago which is probably typical of a country notable for the insularity of its world cities) given the obverse pattern for Rotterdam and Antwerp.

This is, as far as I am aware, the first attempt at the sort of global urban analysis presented in this section. Clearly there are some distinct patterns in the maps we have looked at but equally the distributions are often quite complex and not easily explained (e.g. Brussels' hinterworld, Figure 9). There is a lot of extra work to be done to make sense of these hinterworlds but I think we have glimpsed, for the first time, a picture of Amsterdam in the world under conditions of contemporary globalization.

Chapter 6

Conclusion: unleashing the city (globalization)

This report began by interpreting the search for territorial solutions to the turmoils of modernity as a taming of the city. The latest phase of modernity's turmoil is commonly called globalization. The study above has been about globalization and the way cities are configuring the world-economy anew. Notice that we have been totally city-centric in analysis and interpretation: states and their boundaries have been conspicuous by their absence in the discussion. Globalization has therefore been treated as a sort of unleashing of the city. In the particular segment of the world-economy focussed upon here, production (of services) has been carried out with little obvious restriction or hindrance from political boundaries.

Of course, this is only part of the story of contemporary globalization. States are still critical players and their boundaries persist as important economic features despite the neo-liberal, free market rhetoric and practice that has accompanied the rise of globalization. The point is not that world cities are in some way 'replacing' territorial states, but rather that they are beginning to become 'unhinged' from the 'national economies' state governments are elected to manage. The classic case is London and the UK where South East England's economy is routinely out of sync with other regions of the country. But this is a general paradox that pits a space of flows against a space of places: all world cities are part of an extra-territorial network of connections that are global. Clearly they can bring capital into their state territory in the process of their world city formation but their economic interests remain geographically different from the rest of the state. The only time when this paradox will not operate is when the city is the state. The only current example is Singapore – Hong Kong is a similar case given its relatively strong economic autonomy first from Britain and currently from China. But the world-city state is very much the exception not the rule.

However, one way of interpreting Amsterdam's role in the world city network is as part of the Randstad multi-polar city-region. Although the concept was conceived several decades ago as a national planning instrument, this idea of combining Dutch cities into a single

functional urban unit has resonance for the current globalization era. Major European cities, including Dutch ones, are relatively small compared to their global peers. If size were to be an obstacle for cities reaching their economic potential, then clearly it makes sense to think in terms of promoting combinations of neighbouring cities as with the Randstad concept. In this way of thinking, it is 'Randstad Holland' that is the sole Dutch node in the world city network rather than Amsterdam and Rotterdam. The implication is that because the degree to which this 'city-region' dominates economy of The Netherlands, it can be argued that this country is quite close to being another world-city state. In fact, this seems to be more a matter of planning idealism than economic reality. As we have seen Amsterdam is doing very well in the world city network, it is much better connected than numerous other cities with populations several times larger. If indeed there were an incipient functional multi-nodal world city-region developing here we might expect the constituent cities in the region to begin developing complementary economic niches. Kloosterman and Lambregts (2000) have shown that exactly the opposite is happening: in economic patterns the main cities of the Randstad are converging, actually becoming more alike. I will not consider the idea of Randstad Holland any further here.

In the project from which this study is drawn, we have analysed cities rather than city-regions (the Randstad cities of Utrecht and The Hague are also included in the 316 cities studied). However because we have viewed cities as part of a worldwide network, the implications are much more radical than defining large city-regions. Networks thrive on co-operation not competition. The principle upon which networks operate is mutuality between units. And this is clearly what is found in detailed study of relations between cities – see explicit illustration of this for Frankfurt and London in Beaverstock et al. (2001). Amsterdam will do well when its closest partners in the world city network do well, it will be vulnerable when they are in economic difficulties. Globalization can thus be interpreted as marking a transition from a national mutuality between a city and its state towards a new inter-city mutuality at a transnational scale (Taylor, 1995). Quite obviously, this has profound implications for politics and policy.

The new pattern of city interests can be illustrated by returning to the idea of an interlocking world city network. In this model the key players in the network formation are the global service firms. And their interests are not just transnational, they are trans-city. Firms with

major investments in many cities are not interested in city competition: they leave that to city politicians, albeit profiting from naïve political boosterism. Global service firms require successful cities across the world and they are part of the co-operative structure that makes this possible. Hence they will not be part of any political alliance of one city against another - London v.s Frankfurt, Singapore v.s Hong Kong, or Amsterdam v.s Brussels - these are counter-productive sideshows as far as global service firms are concerned.

Global service firms are at the cutting edge of the contemporary world-economy and their interests are symptomatic of much more general changes. What seems to be emerging is a need for new network policies requiring a network politics running parallel to traditional modern territorial politics. Given the historical dependence on world trading, The Netherlands has the greatest political experience of an open territorial politics with porous boundaries. But globalization is something different. Thinking beyond political territory to conceive of political networks takes us back before the modern era to non-territorial city leagues. The original seventeenth century so-called “Dutch Republic” was in reality a league of cities within a defensive territory (Taylor 1994b). At Westphalia it was the idea of territory not league that was diffused to create modern politics. In the twenty first century we need to be thinking of leagues once again. Now there’s a challenge for Amsterdam.

Epilogue

What we need to know about Amsterdam

The creation of new policy and politics as described above has to be based upon new network knowledges both specialised and general. Currently, the global service firms are developing their own network knowledges seen most explicitly in their in-house training of new recruits. The latter are often 'billeted' in different offices across the world specifically so they can understand the new network geography that is globalization. At a more general level, the prospect for such new knowledge is much bleaker. In the realm of formal social knowledge, we have seen that the social science disciplines have had an inherent territoriality in their make-up. And in terms of popular frameworks of knowledge, territoriality is linked to national identities that show no sign of diminishing. It would seem that despite the conditions of contemporary globalization, spaces of places still take precedent over spaces of flows in the way in which most social knowledge is structured.

What does all this mean in relation to this study's illustration of Amsterdam's place in our globalising world? The first point to make is that, as well as the nationalization of cities and knowledges, there is a second obstacle in the way of appreciating the new city network thinking explored in this monograph. The basic social theory behind the social sciences has taken its cue from the massive social changes consequent upon nineteenth century industrialization (Taylor, 1999a). This industrial focus - modern society equals industrial society – has coloured much of our thinking, not least in how our politics has been organised (left parties have their origins in representing industrial workers). Quite often, and in many different ways, this thinking has involved neglect of other 'non-industrial' activities, notably 'services'. Often denigrated as marginal and dependent, this attitude has only really altered under the pressure of economic statistics that show the degree to which service activities now dominate modern territorial economies. Thus it is necessary to restate the basic argument behind this study. First, towns and cities are the traditional service centres for districts, regions and countries. Second, in contemporary modern society, service activities now dominate economic activities. Third, advanced producer services are at the cutting edge of the world-economy as it globalises. Fourth, this has created world cities as new 'global service

centres' whose network provides a key configuration of contemporary globalization. Fifth, Amsterdam, as a major world city, has to be understood in the context of this world city network.

The results on Amsterdam presented in this monograph are all new and, as we have seen, describe very important processes. But they are only the tip of the proverbial knowledge iceberg for understanding Amsterdam's place and roles in the contemporary world. In Castells' (1996) conception of the space of flows underpinning his network society, he identifies three 'layers' of space and within this the world city network is just one part of the middle layer. In other words, the contemporary global space of flows is an incredibly complex melange of chains, circuits, hierarchies and networks of all manner of flows simultaneously criss-crossing the world in all directions. Even if we restrict our concern to only the nodes that are world cities, it is self-evidently obvious that these great cities are much more than global service centres. Smith and Timberlake (1995) have usefully constructed a typology of the 'inter-city linkages' they think we should be studying in world city research. With three forms of flow – human, material, information – and four functions of flow – economic, political, cultural, social – they suggest 12 different types of linkages. The connectivities described above fall into their information/economic type but even here our subject matter represents only a small part of a large category.

The lesson of all this is that there is an urgent need for a systematic effort to create more network knowledge of Amsterdam and all other world cities. If network assets are as important as territorial assets to a city, then it follows that we need as much knowledge of a city's outside linkages – local, regional, national and global – as we currently have of the internal composition of a city. The latter is very well attended to by censuses and other official data collections and we need an equivalent inventory of a city's external relations. This requires a large-scale monitoring of multifarious flows in and out of the city so as to properly understand Amsterdam in the rapidly changing contemporary world. Remember that the data upon which the current study rests were not collected specifically for Amsterdam but were part of a general global data collection exercise. It is time for us to think seriously about developing an Amsterdam Inventory of External Relations.

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Table 1

Ranking of world cities by citings in the literature

Rank	CITY	Citations
1=	LONDON	15
1=	NEW YORK	15
1=	PARIS	15
1=	TOKYO	15
5=	FRANKFURT	13
5=	ZURICH	13
7=	CHICAGO	12
7=	LOS ANGELES	12
9=	HONG KONG	11
9=	SYDNEY	11
11=	AMSTERDAM	10
11=	SAO PAULO	10
11=	TORONTO	10
14=	MILAN	9
14=	SAN FRANCISCO	9
14=	SINGAPORE	9
17	BRUSSELS	8

Citations are from 15 standard sources in the world cities literature (adapted from Beaverstock et al. (1999, Table 2, p. 448)

Table 2
Basic Data Matrix of Service Values

CITY	FIRM I	FIRM II	FIRM III
CHICAGO	**2**	**0**	**3**
FRANKFURT	**0**	**3**	**0**
HONG KONG	**0**	**1**	**0**
LONDON	**3**	**1**	**3**
LOS ANGELES	**3**	**0**	**3**
MILAN	**1**	**1**	**0**
NEW YORK	**3**	**2**	**3**
PARIS	**1**	**0**	**0**
SINGAPORE	**0**	**1**	**1**
TOKYO	**1**	**1**	**1**

Adapted from Taylor (2001a, Table 1, p. 186)
I is TMP (advertising); II is Dresden Banking Group; and III is Sidley and Austin (law).

Table 3

Configuration of the World City Network

I OUTER CITIES	II US CITIES	III PACIFIC ASIAN CITIES	IV EUROPE-GERMANY CITIES	V OLD COMMON'TH CITIES
784 Tel Aviv 767 Sofia 753 Kuwait 730 Helsinki 730 Quito 724 Beirut 703 Cleveland	769 St Louis 703 Cleveland	740 Taipei 726 Tokyo 725 Bangkok 703 Jakarta	782 Berlin 768 Munich 703 Hamburg	716 Perth 715 Adelaide
696 Casablanca 681 Athens 670 Nairobi 666 Montevideo 664 Jeddah 660 Bucharest 650 Indianapolis 645 Cairo 642 Lagos 629 Panama 624 Lima 608 Vienna	680 Dallas 664 Kansas City 650 Pittsburgh 634 Portland 633 Atlanta 631 Seattle 623 Charlotte 622 Denver 620 Detroit 607 Philadelphia	664 Beijing 658 Manila 633 Seoul 630 Kuala Lumpur 607 Hong Kong	697 Cologne 660 Stuttgart	687 Brisbane 657 Hamilton 616 Birmingham
599 Dubai 595Copenhagen 595 Oslo 592 Zagreb 590 Karachi 586 Chennai 584 Bangalore 572 Istanbul 570 Lisbon 553 Bratislava 535 Kiev 534 Nicosia 533 Calcutta	560 Boston 557 San Diego 524 Washington 524 Minneapolis 502 San Francis 500 Houston	598 Guangzhou 593 Shanghai 560 Ho Chi Min 516 Istanbul 511 Mumbai 500 Singapore	593 Frankfurt 569 Paris 530 Budapest 530Dusseldorf 519 Warsaw 511 Milan 508 Luxembourg	547 Manchester 504 Nassau 501 Vancouver 501 Nicosia
495 Riyadh 492 Prague 468 Auckland 461 Moscow 457 Johannesburg 452 Cape Town 448 Manila 446 Budapest 427 Mumbai 424 Warsaw 421 Port Louis 418 Santiago	499 Melbourne 473 Los Angeles 462 Vancouver 437 Chicago 425 Miami 410 Montreal 409 Toronto	455 Sao Paulo 443 Caracas 416 New Delhi 405 Santiago	482 Antwerp 460 Prague 452 Rome 437 Lyons 433 **Amsterdam** 402 Moscow	457 Abu Dhabi 453 Montreal 442 Auckland 441 Calgary 426 London 423 Dubai 410 Port Louis 408 Dublin 402 Wellington

Adapted from Taylor et al. (2001b, Table 2)

Table 4
Global Network Connectivities

RANK	CITY	GNC
1	London	1.000
2	New York	0.9763
3	Hong Kong	0.7069
4	Paris	0.6991
5	Tokyo	0.6906
6	SINGAPORE	0.6453
7	CHICAGO	0.6155
8	Milan	0.6036
9	Los Angeles	0.5995
10	Toronto	0.5946
11	Madrid	0.5944
12	**AMSTERDAM**	**0. 5901**
13	Sydney	0.5784
14	FRANKFURT	0.5673
15	BRUSSELS	0.5571
16	Sao Paulo	0.5409
17	San Francisco	0.5075
18	Mexico City	0.4860
19	Zurich	0.4848
20	Taipei	0.4771
62	Houston	0.3379
63	LUXEMBOURG	0.3252
64	Beirut	0.3229
74	Stuttgart	0.2697
75	ROTTERDAM	0.2683
76	Philadelphia	0.2682
95	Riyadh	0.2375
96	ANTWERP	0.2372
97	Adelaide	0.2339

Peer group cities are in capitals – see text.

Table 5
Decomposition of Connectivity by Sector

CITY	ACC.	ADV.	B/F	INS.	LAW	MAN.
AMSTERDAM	**.3761**	**.1819**	**.2253**	**.0736**	**.0401**	**.1029**
SINGAPORE	**.2734**	**.1565**	**.3072**	**.1028**	**.0464**	**.1137**
CHICAGO	**.3564**	**.1330**	**.2605**	**.1006**	**.0348**	**.1148**
FRANKFURT	**.3121**	**.1725**	**.3034**	**.0650**	**.0680**	**.0790**
BRUSSELS	**.2883**	**.1659**	**.2595**	**.1057**	**.0629**	**.1178**
LUXEMBOURG	**.4638**	**.0000**	**.3723**	**.1130**	**.0223**	**.0286**
ROTTERDAM	**.5868**	**.0000**	**.1713**	**.1272**	**.0146**	**.1000**
ANTWERP	**.5491**	**.1033**	**.2052**	**.0880**	**.0207**	**.0336**
WCN AVERAGE	**.4398**	**.1571**	**.2270**	**.0776**	**.0169**	**.0817**

Table 6

Decomposition of Connectivity by Dominance

CITY	Total dominant connections	Total subordinate connections	RATIO
AMSTERDAM	**11839**	**4825**	**2.45**
SINGAPORE	**11374**	**5602**	**2.09**
CHICAGO	**13242**	**4893**	**2.71**
FRANKFURT	**13569**	**3934**	**3.45**
BRUSSELS	**9057**	**5806**	**1.56**
LUXEMBOURG	**3341**	**4181**	**0.80**
ROTTERDAM	**2298**	**3405**	**0.67**
ANTWERP	**1734**	**3313**	**0.52**

Table 7
Standard Errors of Estimate

CITY	STANDARD ERROR
AMSTERDAM	**.017**
SINGAPORE	**.016**
CHICAGO	**.019**
FRANKFURT	**.023**
BRUSSELS	**.014**
LUXEMBOURG	**.035**
ROTTERDAM	**.033**
ANTWERP	**.034**

Figure 1 Miniscule Section of the World City Network

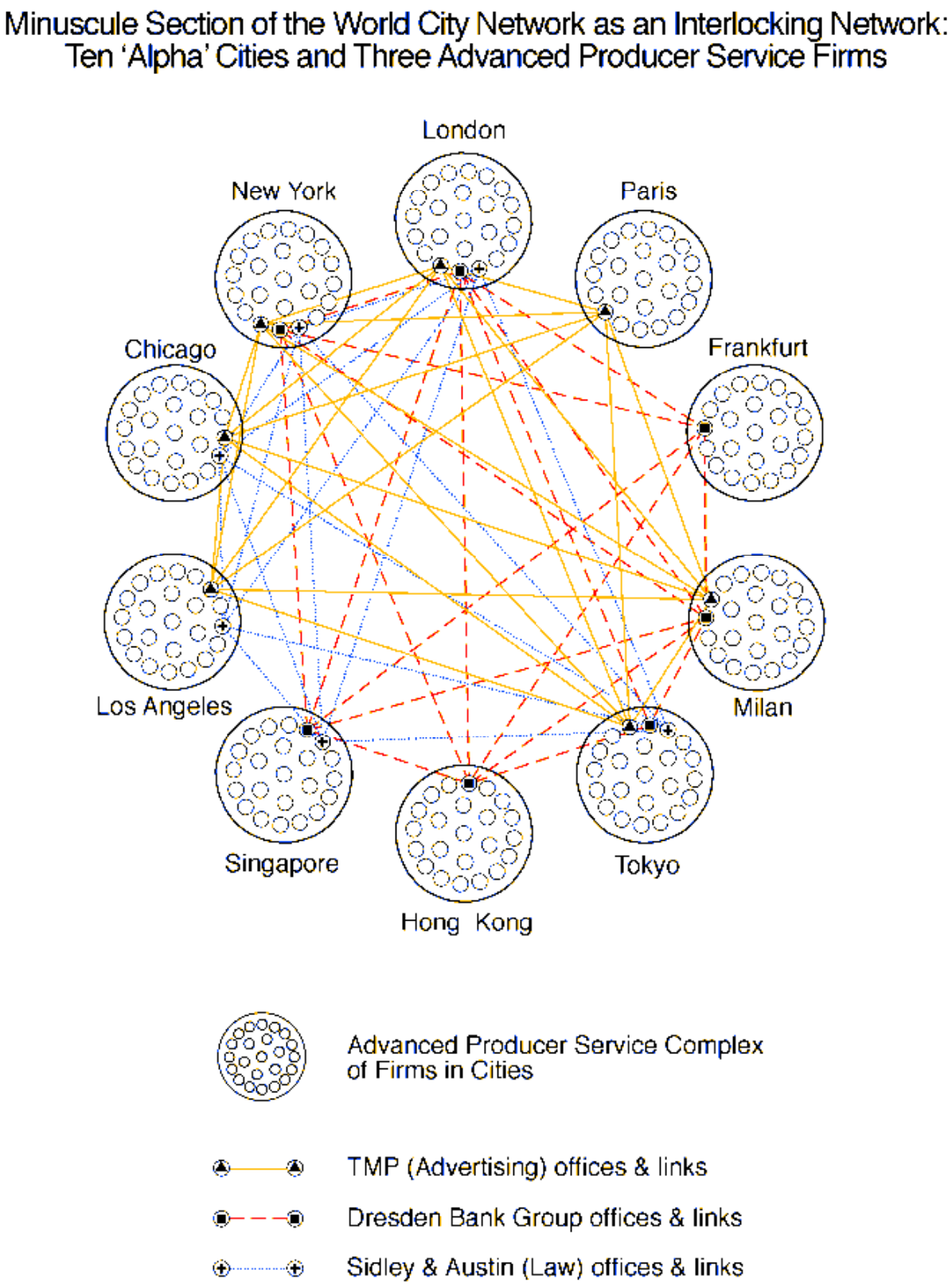


Figure 2 The GaWC "Archipelago"

This is the base map for all other maps in the portfolio.

Cities are placed in their approximate relative geographical positions. The codes for cities are:

AB Abu Dhabi; AD Adelaide; AK Auckland; AM Amsterdam; AS Athens; AT Atlanta; AN Antwerp; BA Buenos Aires; BB Brisbane; BC Barcelona; BD Budapest; BG Bogota; BJ Beijing; BK Bangkok; BL Berlin; BM Birmingham; BN Bangalore; BR Brussels; BS Boston; BT Beirut; BU Bucharest; BV Bratislava; CA Cairo; CC Calcutta; CG Calgary; CH Chicago; CL Charlotte; CN Chennai; CO Cologne; CP Copenhagen; CR Caracas; CS Casablanca; CT Cape Town; CV Cleveland; DA Dallas; DB Dublin; DS Dusseldorf; DT Detroit; DU Dubai; DV Denver; FR Frankfurt; GN Geneva; GZ Guangzhou; HB Hamburg; HC Ho Chi Minh City; HK Hong Kong; HL Helsinki; HM Hamilton(Bermuda); HS Houston; IN Indianapolis; IS Istanbul; JB Johannesburg; JD Jeddah; JK Jakarta; KC Kansas City; KL Kuala Lumpur; KR Karachi; KU Kuwait; KV Kiev; LA Los Angeles; LB Lisbon; LG Lagos; LM Lima; LN London; LX Luxembourg; LY Lyons; MB Mumbai; MC Manchester; MD Madrid; ME Melbourne; MI Miami; ML Milan; MM Manama; MN Manila; MP Minneapolis; MS Moscow; MT Montreal; MU Munich; MV Montevideo; MX Mexico City; NC Nicosia; ND New Delhi; NR Nairobi; NS Nassau; NY New York; OS Oslo; PA Paris; PB Pittsburgh; PD Portland; PE Perth; PH Philadelphia; PL Port Louis; PN Panama City; PR Prague; QU Quito; RJ Rio de Janeiro; RM Rome; RT Rotterdam; RY Riyadh; SA Santiago; SD San Diego; SE Seattle; SF San Francisco; SG Singapore; SH Shanghai; SK Stockholm; SL St Louis; SO Sofia; SP Sao Paulo; ST Stuttgart; SU Seoul; SY Sydney; TA Tel Aviv; TK Tokyo; TP Taipei; TR Toronto; VI Vienna; VN Vancouver; WC Washington DC; WL Wellington; WS Warsaw; ZG Zagreb; ZU Zurich

WORLD CITY ARCHIPELAGO

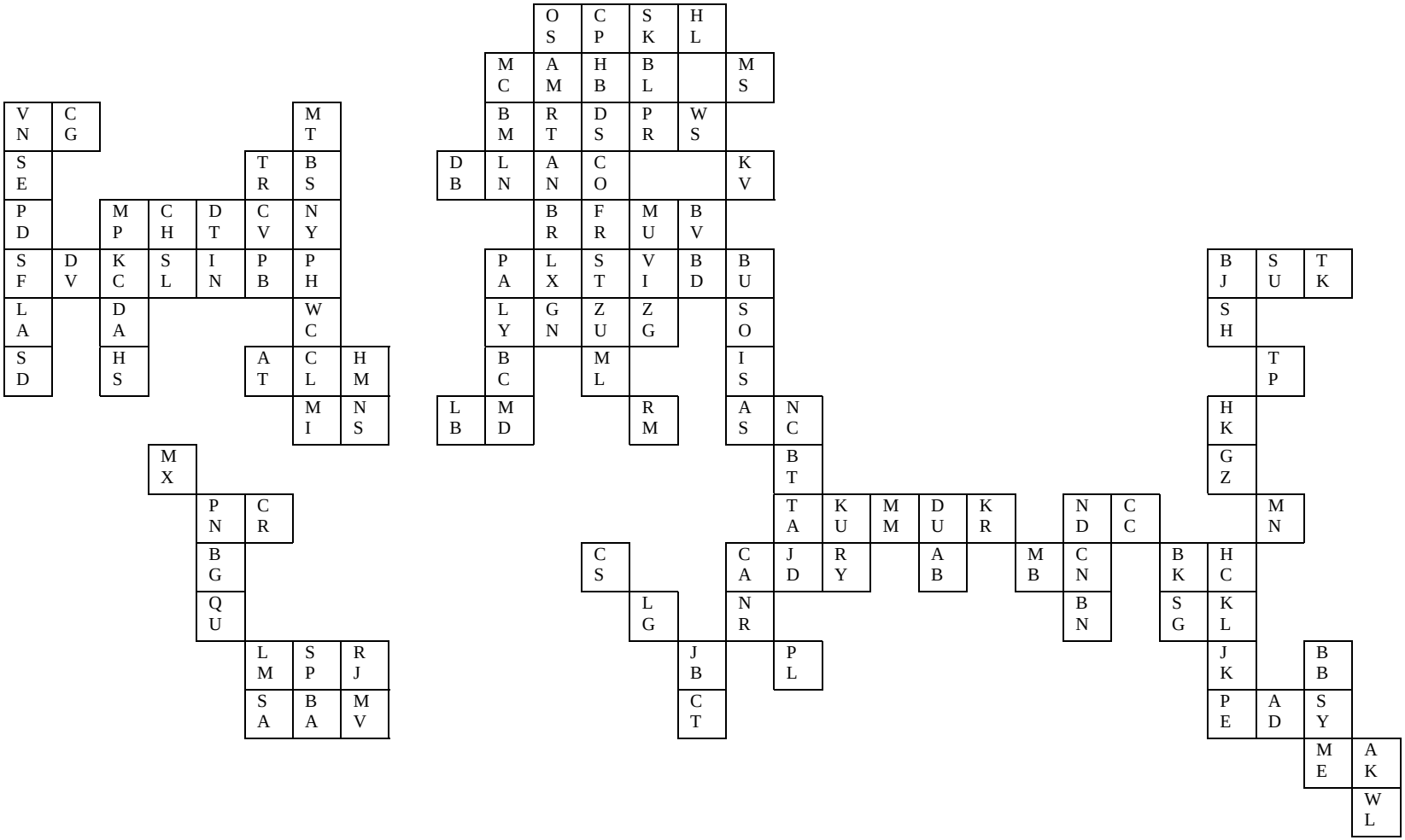


Figure 3 Amsterdam's Hinterworld in Absolute Values

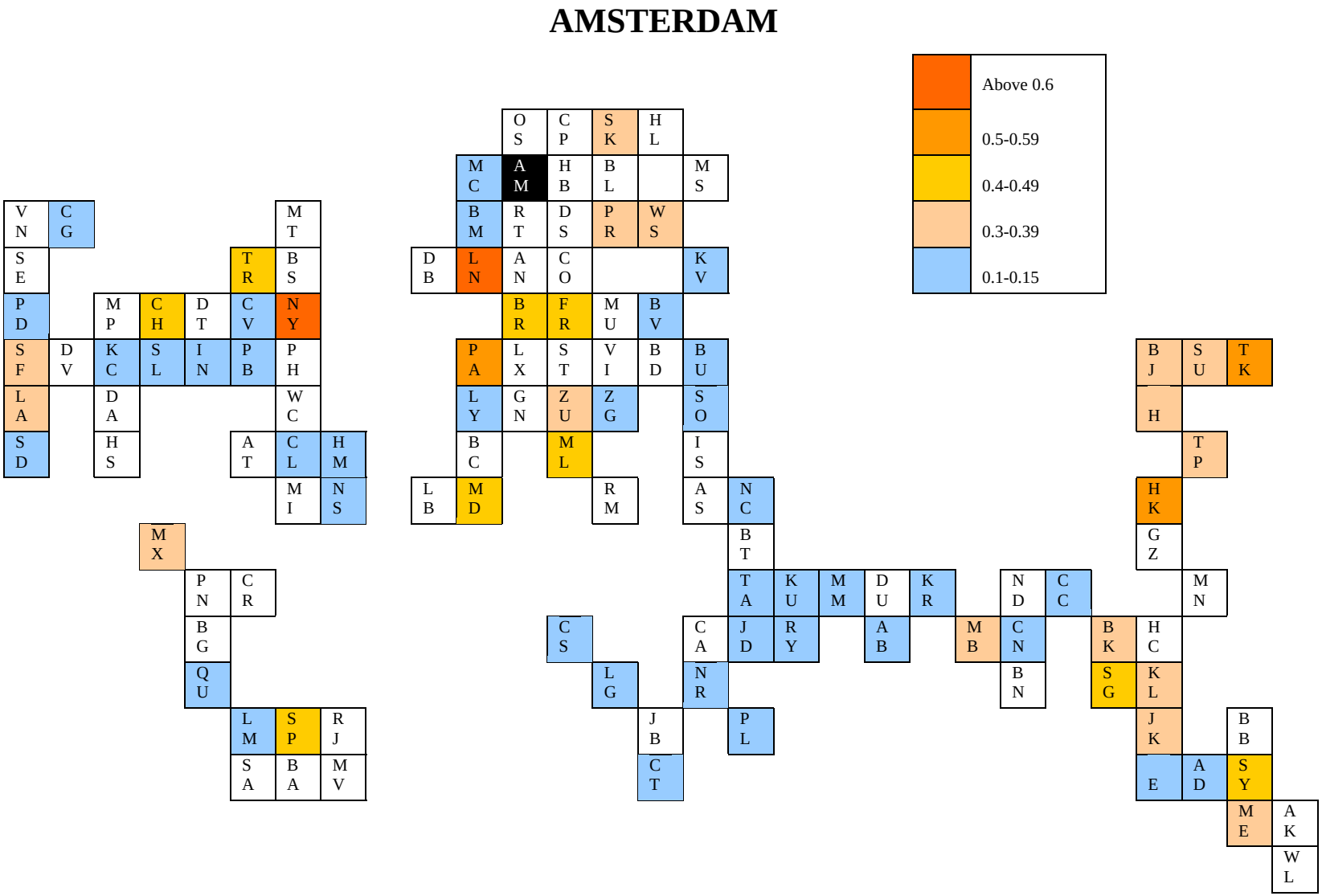


Figure 4 Amsterdam's Hinterworld

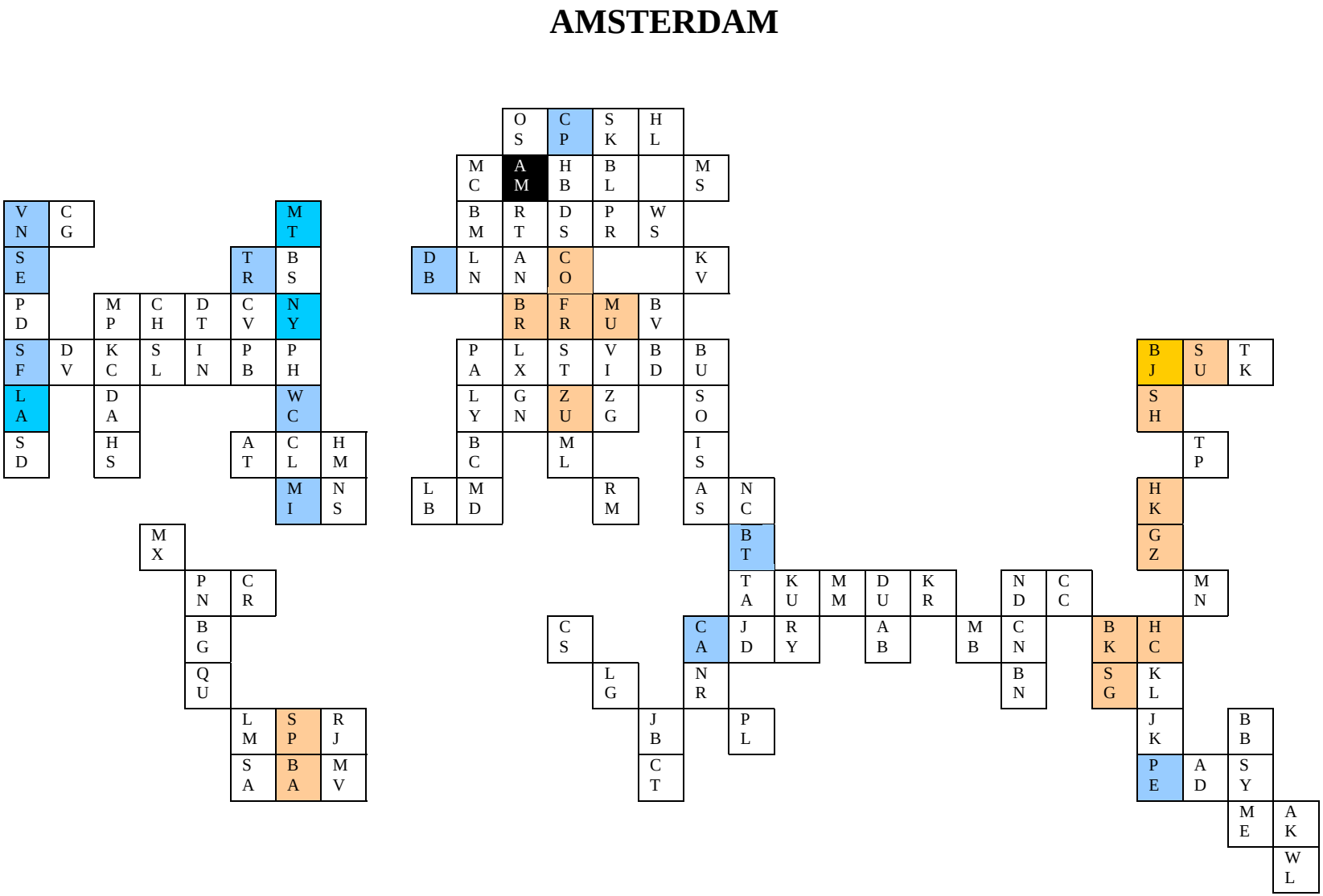


Figure 5 Singapore's Hinterworld

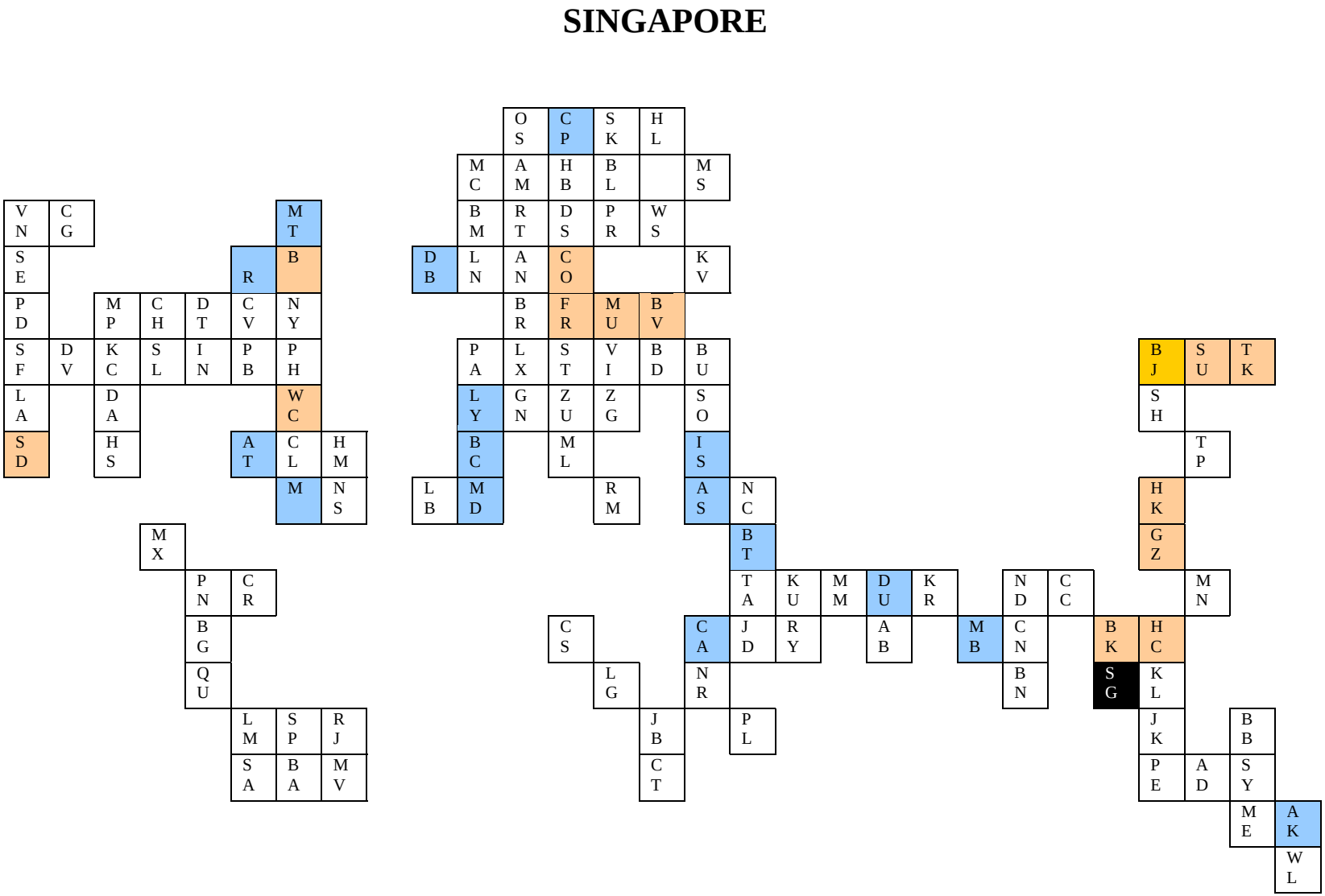


Figure 6 Chicago's Hinterworld

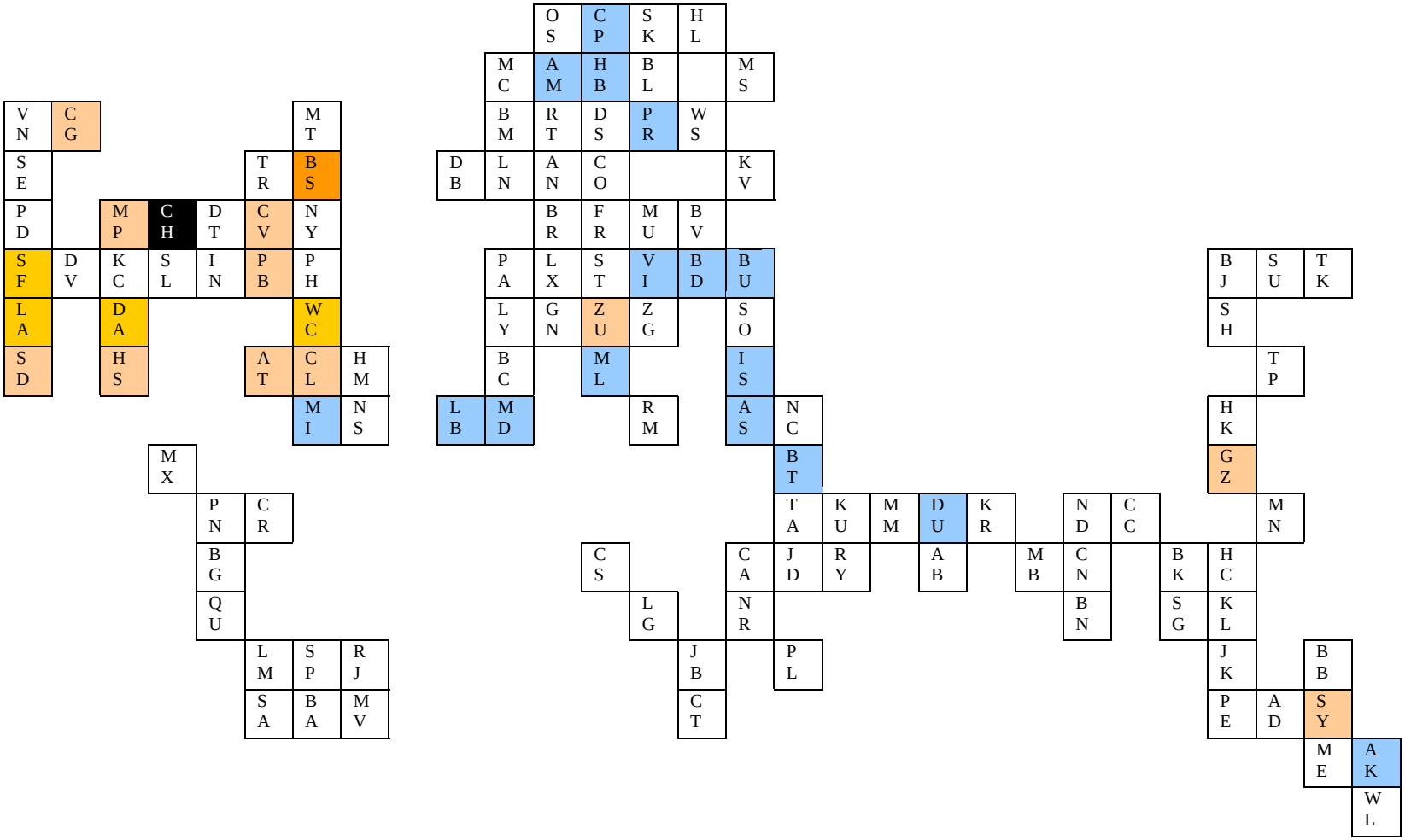


Figure 7 Frankfurt's Hinterworld

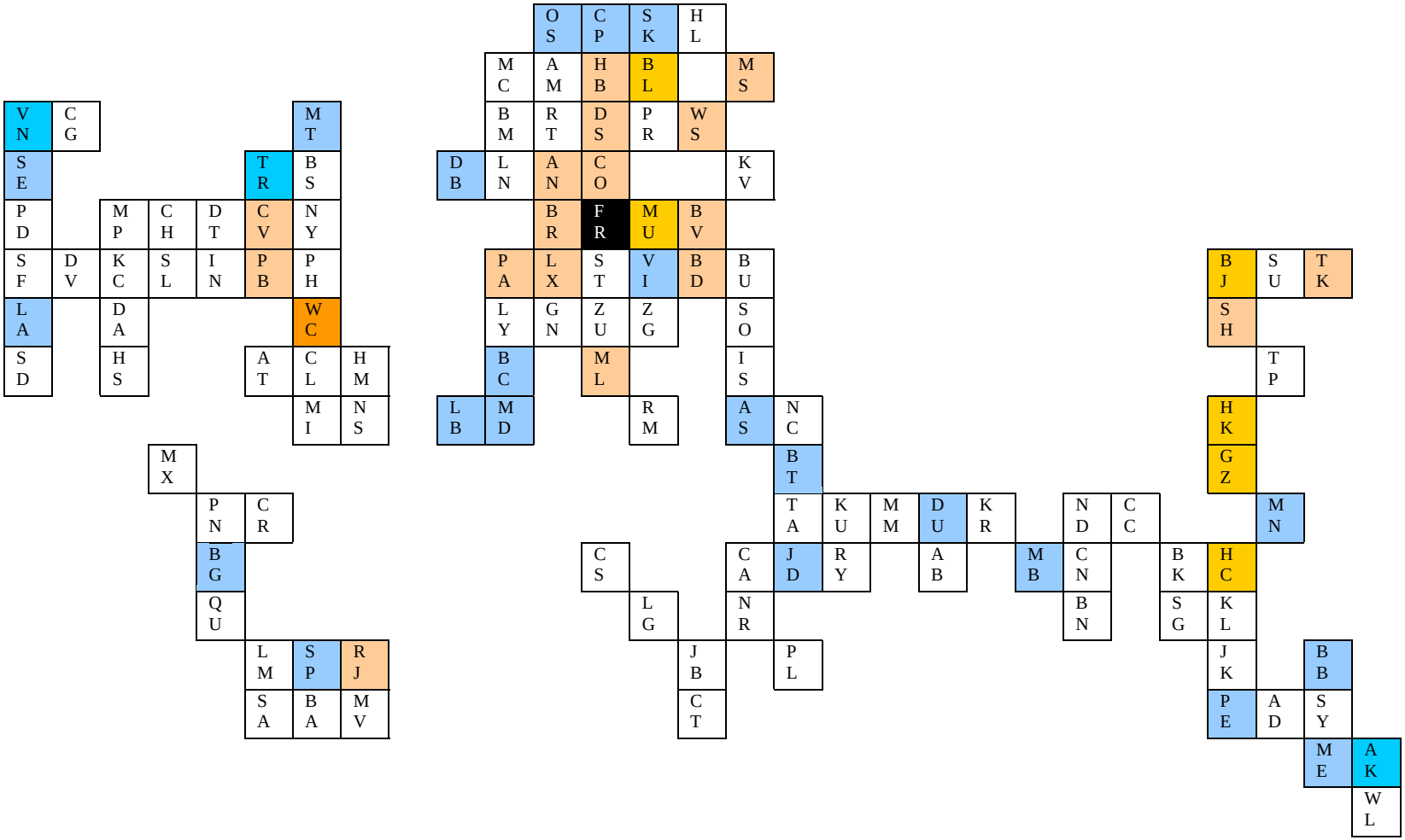


Figure 8 Brussels' Hinterworld

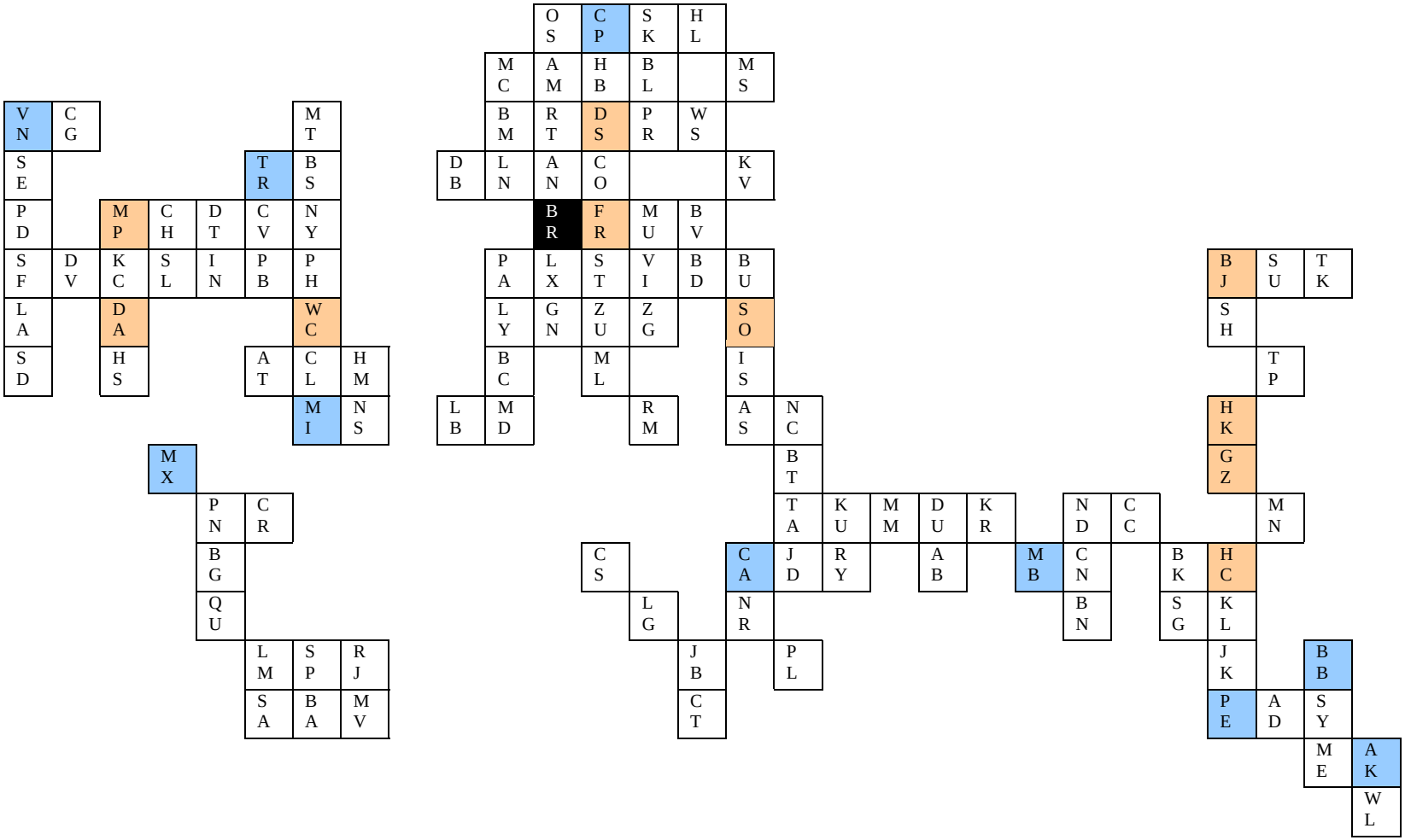


Figure 9 Luxembourg's Hinterworld

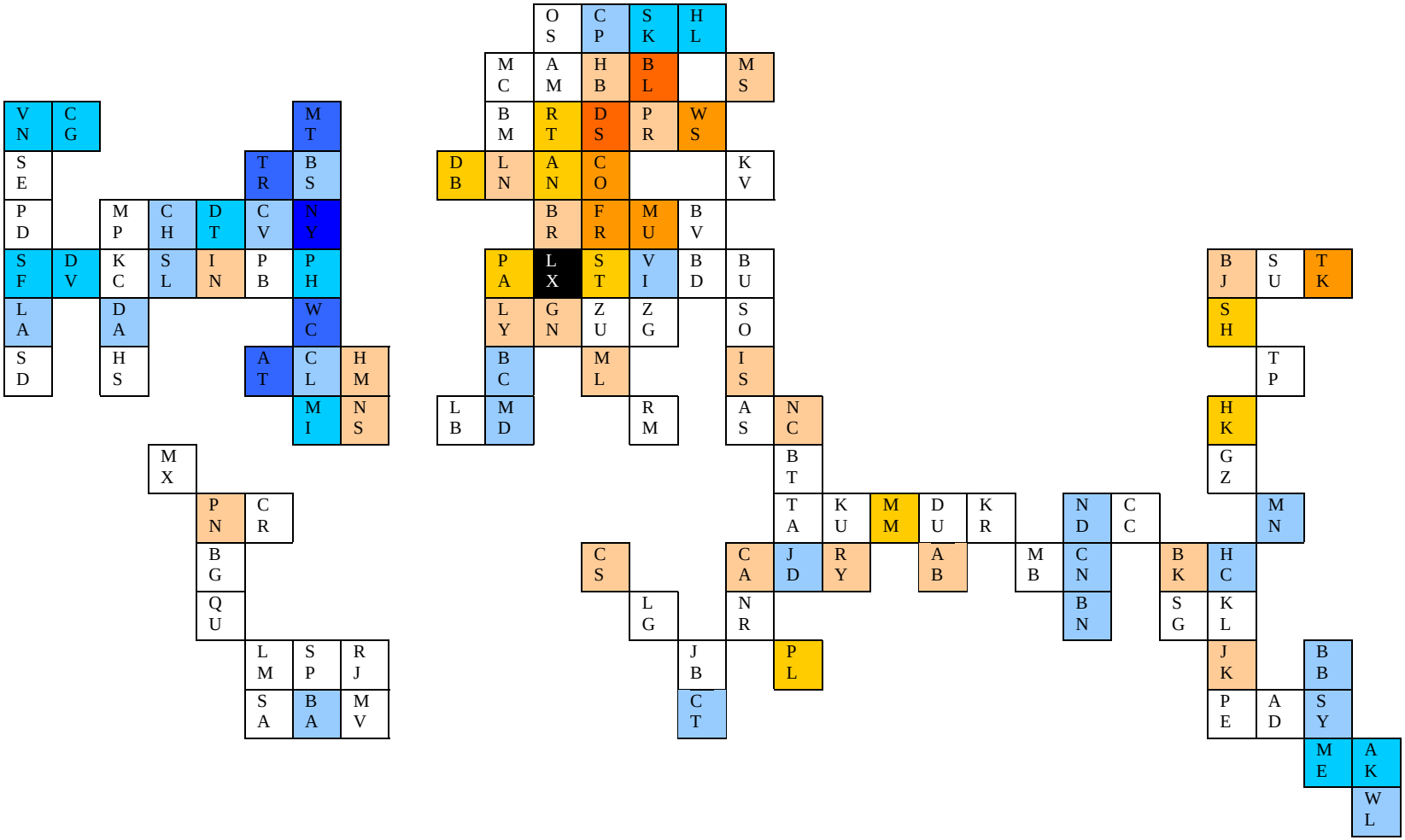


Figure 10 Rotterdam's Hinterworld

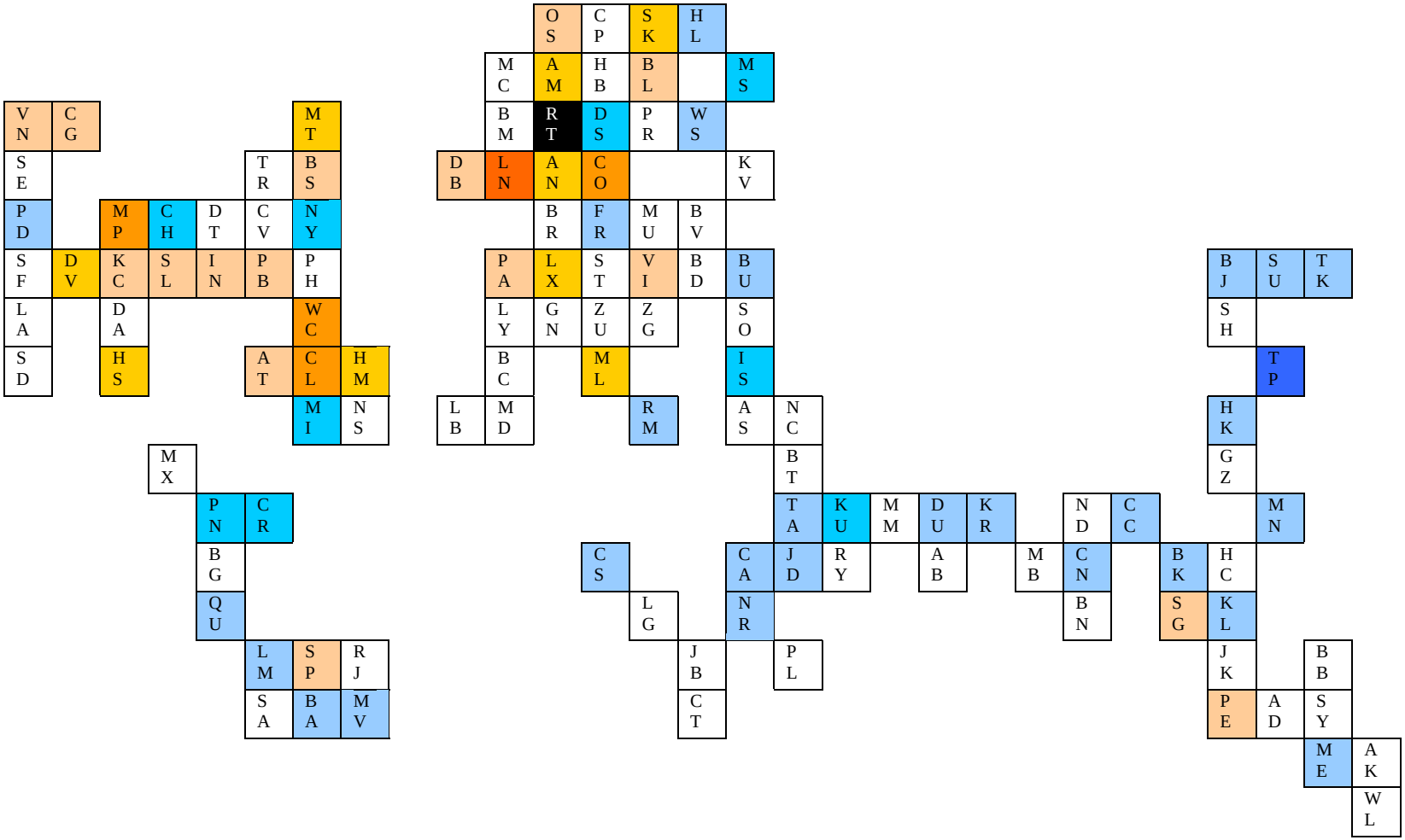
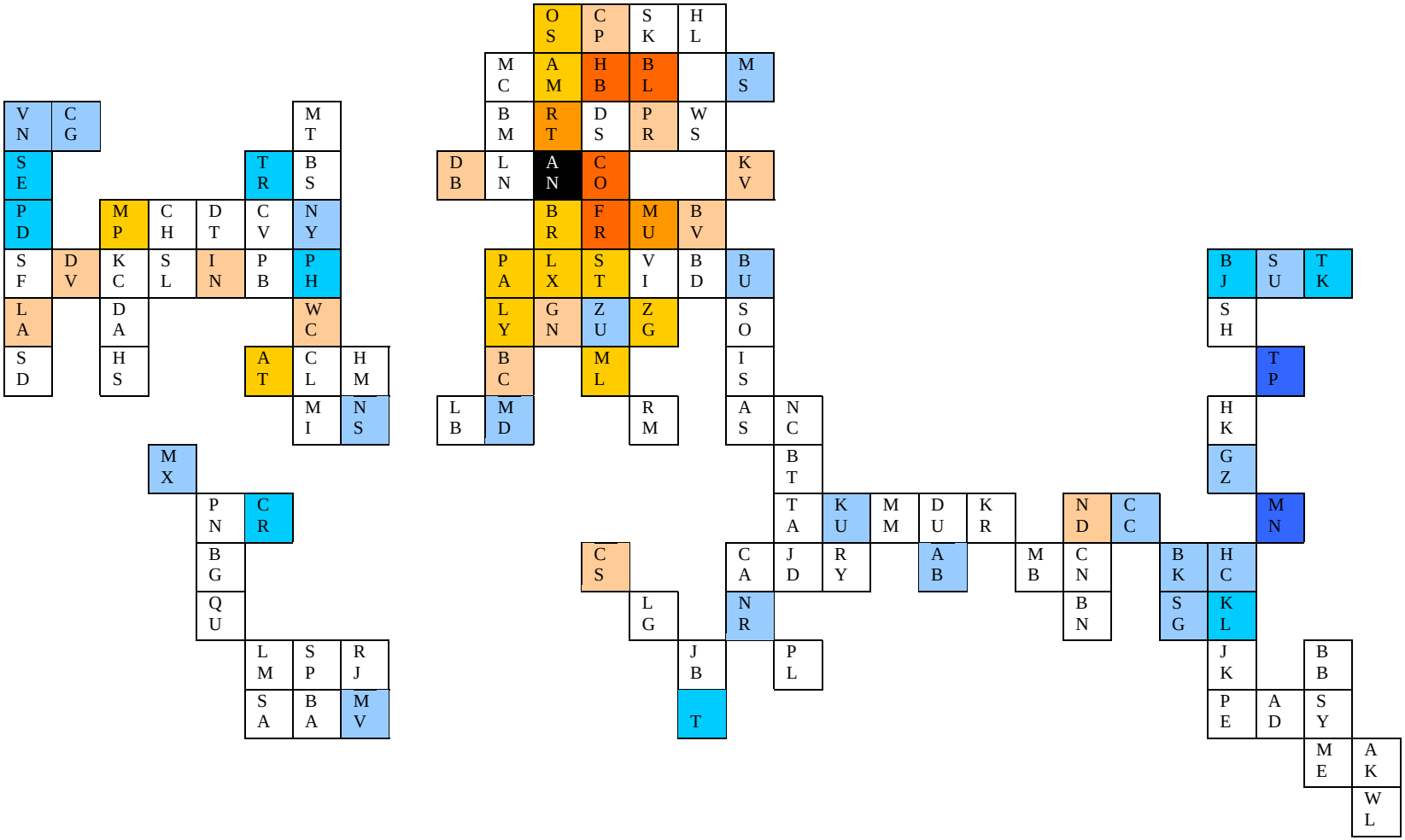


Figure 11 Antwerp's Hinterworld



APPENDIX A "The GaWC 100"

ACCOUNTANCY

AGN International
Arthur Andersen
BDO International
Ernst & Young
Fiducial International
Grant Thornton International
HLB International
Horwath International
IGAF. International Group of Accounting Firms
KPMG
MacIntyre Sträter International
Moore Stephens International
Moores Rowland International
Nexia International
PKF International
PricewaterhouseCoopers
RSM International
Summit International + Baker Tilly

ADVERTISING

Asatsu DK
BBDO Worldwide
CMG. Carlson Marketing Group
D'Arcy Masius Benton & Bowles
Draft Worldwide
Euro RSCG
FCB
Hakuhodo Inc.
Impiric
J Walter Thompson
McCann-Erickson WorldGroup
Ogilvy & Mather Worldwide Inc.
Saatchi and Saatchi
TMP Worldwide
Young and Rubicam Inc.

BANKING/FINANCE

ABN-AMRO Holding NV
Bank of Tokyo-Mitsubishi
Barclays
Bayerische HypoVereinsbank
Bayerische Landesbank Girozentrale
BNP Paribas
Chase Hambrecht & Quist
CitiGroup (Citibank +SSBCiti Asset Management)
Commerzbank
Credit Suisse First Boston
Dai-Ichi Kangyo Bank
Deutsche Bank
Dresdner Bank
Fuji Bank
HSBC
ING Bank
J. P. Morgan
Rabobank International
Sanwa
SDI (Sakura +Dellsher Bank)
Sumitomo Bank
UBS AG
WestLB (Westdeutsche Landesbank Girozentrale)

INSURANCE

Allianz Group
CGNU
Chubb Group
Fortis
Liberty Mutual
Lloyd's
Prudential
Reliance Group Holdings
Royal and SunAlliance
Skandia Group
Winterthur

LAW

Allen and Overy
Baker and McKenzie
Cameron McKenna
Clifford Chance
Coudert Brothers
Dorsey and Whitney
Freshfields Bruckhaus Deringer
Jones Day
Latham and Watkins
Linklaters - Alliance
Lovells Boesebeck Droste
Morgan Lewis
Morrison and Foerster LLP
Sidley and Austin
Skadden, Arps, Slate, Meagher, and Flom LLP
White and Case

MANAGEMENT CONSULTANCY

A.T. Kearney
Andersen Consulting
Bain & Company
Booze, Allen & Hamilton
Boston Consulting Group
Cap Gemini Consulting
Compass
CSC
Deloitte Touche Tohmatsu
Hewitt Associates
IBM
Logica Consulting
McKinsey & Company
Mercer Management Consulting
Sema Group
Towers Perrin
Watson Wyatt Worldwide

APPENDIX B

List of Cities

London
New York
Hong Kong
Paris
Tokyo
Singapore
Chicago
Milan
Los Angeles
Toronto
Madrid
Amsterdam
Sydney
Frankfurt
Brussels
Sao Paulo
San Francisco
Mexico City
Zurich
Taipei
Mumbai
Jakarta
Buenos Aires
Melbourne
Miami
Kuala Lumpur
Stockholm
Bangkok
Prague
Dublin
Shanghai
Barcelona
Atlanta
Moscow
Istanbul
Beijing
Washington
Auckland
Vienna
Warsaw
Seoul

Lisbon
Johannesburg
Copenhagen
Budapest
Manila
Montreal
Hamburg
Munich
Dusseldorf
Berlin
New Delhi
Rome
Dubai
Bogota
Athens
Santiago
Caracas
Cairo
Boston
Dallas
Houston
Luxembourg
Beirut
Vancouver
Oslo
Geneva
Seattle
Rio De Janeiro
Helsinki
Montevideo
Brisbane
Denver
Stuttgart
Rotterdam
Philadelphia
Minneapolis
Panama City
Perth
Lima
St Louis
Bangalore

Bucharest
Karachi
Detroit
Wellington
Calcutta
Ho Chi Minh City
Manama
Jeddah
Tel Aviv
Cologne
Lyon
Cape Town
Riyadh
Antwerp
Adelaide
San Diego
Nairobi
Quito
Manchester
Chennai
Hamilton
Calgary
Portland
Nassau
Birmingham
Charlotte
Guangzhou
Casablanca
Port Louis
Cleveland
Bratislava
Indianapolis
Abu Dhabi
Kiev
Kuwait
Nicosia
Kansas City
Pittsburgh
Sofia
Zagreb
Lagos

Amman
Guayaquil
Ruwi
Osaka
Monterrey
Bilbao
Guatemala
Abidjan
Valencia
Harare
Asuncion
Bristol
Baltimore
Leeds
Glasgow
Sanjosecr
Marseilles
Phoenix
Tunis
Almaty
St Petersburg
Edinburgh
Colombo
Hanoi
Hobart
Cincinnati
Accra
Santo Domin
Dhaka
Tampa
San Salvador
Riga
Lusaka
Lahore
Dresden
Columbus
Strasbourg
San Jose Ca
Leipzig
Rochester
Islamabad

Labuan
Durban
Porto Alegro
Guadalajara
Belo Horizonte
Windhoek
Palo Alto
Lille
La Paz
Kampala
Hartford
Gothenburg
Tallinn
Doha
Richmond
Vilnius
Buffalo
Kingston
Bordeaux
Christchurch
Honolulu
Ljubljana
Belfast
Edmonton
Curitiba
Limassol
Nottingham
Turin
Winnipeg
Tegucigalpa
Ottawa
Dar Es Salaam
Basel
Las Vegas
Nuremberg
Shenzen
Seville
Maputo
Tehran
Malmo
Utrecht
Dakar
Newcastle
Liverpool
Medellin
New Orleans

Baku
Hanover
Bologna
Aberdeen
Canberra
Lausanne
Sacramento
Southampton
The Hague
Banda Sb
Doula
Salvador
Omaha
Gaberone
Port of Spain
Managua
Bern
Tashkent
Hyderabad
Yokohama
Tijuana
Essen
Norwich
Dalian
Brasilia
Nagoya
Luanda
Grenoble
Belgrade
Pretoria
Naples
Bergen
Penang
Quebec
Sheffield
Port Mose
Bonn
Reykjavik
Cardiff
Yangon
Arhus
Macao
Kyoto
Suva
Genoa
Mainz

Georgetown
Ahmadabad
Tianjin
Ciudad Juárez
Refice
Addis Ababa
Dortmund
Bangung
Kobe
Bulawayo
Pusan
Plymouth
Damascus
Alexandria
Wilmington
Rabat
Palermo
Mannheim
Ankara
Linz
Tirana
Kinshasa
Mombassa
Medan
Sanaa
Algiers
Jerusalem
Freetown
Trieste
Sarajevo
Minsk
Port Au Prince
Yerevan
Lome
Tripoli
Tblisi
Liege
Xiamen
Batam
Krakow
Khartoum
Nanjing
Malacca
Venice
Manaus
Havana

Kawasaki
Yaonde
Jaipur
Monrovia
Ulan Bator
Rawalpindi
Conakry
Djibouti
Baghdad
Kabul
Brazzaville
Lucknow
Pyonyang
Alma Ata