

Smart Urban Regions of the Future

TOWARDS AN INNOVATIVE KNOWLEDGE INFRASTRUCTURE FOR VITAL AND RESILIENT CITIES

**Programme study: driving forces behind urban dynamics and multilevel
governance**

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TOWARDS AN INNOVATIVE KNOWLEDGE INFRASTRUCTURE FOR VITAL AND RESILIENT CITIES

Programme study: driving forces behind urban dynamics and multilevel governance

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As part of the Connecting Sustainable Cities initiative (Verbinden van Duurzame Steden; VerDuS), the Dutch Ministry of Infrastructure & Environment, the Dutch Ministry of the Interior, NWO and Platform31 have taken the initiative to develop a research programme for the 2014-2020 period entitled “Smart Urban Regions of the Future” (SURF). Following an evaluation of the VerDuS approach (recorded in the “VerDuS perspective memo; completion and concretisation”, November 2013), the knowledge development and dissemination activities in this programme will be aimed at putting “the international development of urban regions in the Netherlands onto national and urban/regional policy agendas”.

The programme looks for policy-driven research that positions the Netherlands in European trends of metropolisation, economic growth and innovation, and for urban regions in the Netherlands to achieve excellent economic performance (in conjunction with social and environmental performance). The SURF programme explicitly seeks answers to “How can we achieve excellence in competitiveness and complementarities structures of urban regions?”, “What is the competitiveness of urban regions in an international context?” and “Which regional and local policies and instruments contribute best to urban vitality, resilience and, ultimately, competitiveness?” The question, therefore, is how our Dutch urban regions, based on the qualities they have, can excel internationally and what the distinguishing features are. This knowledge should be developed by researchers in cooperation with policymakers and other social partners. It is important to have an understanding, in advance, of what the driving forces, determining factors and causal relationships are.

The SURF programme can build on the knowledge developed in current and soon to be completed research programmes like Kennis voor Krachtige Steden (KKS; Knowledge for Powerful Cities), Duurzame Bereikbaarheid Randstad (DBR; Sustainable Accessibility of the Randstad, and Urban Regions in the Delta (URD). It goes without saying that SURF seeks to align with policy development within the co-financing departments and research initiatives in the Netherlands and Europe (Horizon2020, EIP Smart Cities and JPI Urban Europe).

In preparation for the new programme, the direction of the research content will be determined. This memorandum, which provides an initial elaboration of the challenges facing Dutch urban regions, also aims to provide a framework for research projects.

The **essence** of the memorandum is that if Dutch urban regions are to excel and to continue to play an international role, spatial structures and infrastructures, positions in networks and flows, and governance will have to be adapted, integrated and applied in an innovative and smart manner. Only by doing this we can use the untapped potential in urban areas, which we are convinced exists. This should lead to more vitality and resilience using less space and fewer resources (“more with less”).

1) De Raad van Toezicht VerDuS, zoals verwoord in de Perspectiefnotitie VerDuS.

Untapped potential

Dutch urban regions face significant socio-economic challenges. The financial crisis is severely testing the vitality and resilience of urban regions because sectoral specialisations and location factors, successful or not, have an impact especially at the regional level. Regions specialising in economic sectors that are experiencing a global downturn are vulnerable. They are struggling to keep afloat amid intensified competition. In contrast, regions with specialisations driven by knowledge and innovation, and which moreover have the flexibility to adapt to changing market conditions, are at an advantage. The increasing pace of technological innovation and its use means that regions have to continue to invest in developing knowledge and applications, thereby renewing themselves – even after the financial crisis. New challenges will emerge, and these have to be responded to effectively. But in addition to a defensive policy emphasis on **resilience** – the ability to return to the old path of development – a proactive approach to urban **vitality** is essential – the ability to define, explore and exploit new paths of development. The pursuit of vitality is thus more comprehensive than resilience.

Urban regions and the cities in these regions are nodes incorporated in a set of **networks and flows**. These networks and flows span different scales, from global networks of trade, knowledge and knowledge workers to regional networks of commuting in a polycentric urban structure, changing networks of shopping behaviour, increasingly complex daily networks of multitasking in smaller households (“a thousand things a day”): in short, networks of interaction on a growing number of sliding scales. Despite the large increase in mobility and flows, both physical and virtual, cities increasingly make up the focal points of society. The future of the urban region depends on its ability to facilitate new connections and attract networks. Much of the resilience and vitality in urban areas is to be found in the self-organising capacity of citizens, businesses and business clusters. It is important to see and understand this self-organisation. However, steering vitality and resilience in the right direction requires more. Besides the much needed economic development, there is also the socially perceived need for ecological and social sustainability and the preservation and development of health and safety.

With the rise of emerging economies in global markets, international competition is increasing for European and Dutch regions. In addition to seeking low-cost production, urban regions have to create value through smart use of the latest technologies and new combinations of technology and market knowledge. This will lead to **excellence** and economic renewal. However, international economic **competitiveness** with excellent metropolitan functions will not come about automatically – especially since there will be fewer resources, less obvious room for growth, fewer raw materials, fewer policy instruments and more conflicting interests of functions in the urban regions.

Urban regions and economies are influenced by driving forces such as globalisation, technology and digitisation and demographic and labour-market transitions (which will affect ageing, household size, migration, contraction and disposable incomes). It is therefore important for urban regions to gain vitality and resilience. In seeking to attain the desired national and international excellence and competitiveness with fewer natural and other resources, less space and tighter policies (“more with less”), the **social challenges** of future urban regions become visible. Against this backdrop, how can innovation, sustainability, competitiveness, cohesion, accessibility, manageability,

organisational ability, health, earning power, housing needs in submarkets, matching on labour markets, a more conservative programming of office and retail property markets, economic structure improvement, knowledge economy, "mainports", "brainports", vibrant inner cities, spatial quality and equitable access to facilities be integrated into a vital and resilient urban area with network positions at many scale levels? How should infrastructures in the region be adapted and combined to guarantee the connectivity and transfer functions of "global and regional pipelines"? What untapped potential can be activated and used? And what incentives and forms of (smart) governance are needed to accommodate this should the self-organising capacity of urban regions, people and companies prove insufficient?

In order to capitalise on the untapped potential for urban economic excellence and to meet urban challenges with fewer resources and less space, smart¹ forms of use are needed: infrastructure, urban structures, network positions, the spatial organisation of functions in urban areas, the potential for creative entrepreneurship and innovation capacity of businesses and knowledge institutions, participatory citizens ("social initiative") and an anticipatory, stimulating, and enabling government. It is only by using smart infrastructures and new technology (ICT, materials, and concepts), properly embedding networks in the regions (and regions in networks) and having appropriate governance in place that the desired quality leap can be made. This involves connecting "smart structures" with "smart networks" and "smart governance" – a combination with the potential to facilitate the social dynamics of urban regions in the future. This is shown schematically in Figure 1.

Figure 1: Framework for Vital and Resilient Urban Regions



1) In SURF, smart stands for smart combinations of existing technologies, particularly in the field of ICT. Activities in urban areas, such as travelling, housing, recreation and food can become smarter by using the possibilities of internet, smartphone, social media, sensing, etc. Smart also stands for self-organising, bottom-up initiatives where residents or consumers, in association with businesses, provide in those needs previously provided for by the government and utilities companies, or "supply chains" in the industry. Untapped potential can thus be used, leading to a more sustainable, cohesive and healthy urban society.

This memorandum – based in part on a survey of the available literature – discusses (1) the driving forces behind and development dimensions of social dynamics in urban areas, (2) the capacity of urban regions to be well-placed in economic and social networks (“smart networks”), (3) the infrastructures of urban regions required to accommodate future dynamics (“smart structures and design”), and (4) the administrative commitment and partnership forms that are in keeping with the social and economic dynamics in urban regions and the associated structures and networks (“smart governance”).

Increasing complexity of social and economic dynamics in cities

Identifying the driving forces behind and social and economic trends in urban dynamics can quickly become complex. Although it is useful to zoom in on parts of this complexity in order to define a research area, it is also useful to have a clear overview of the complexity. Vitality and resilience are related to many factors, but to some more than others. This requires research to extensively account for the identification of effects, the causality of relationships, the influence of natural selection in groups of people and businesses, and control over other factors that may be expected to influence the relationship under research. The resilience and vitality of future urban regions should be aligned especially with networks (“flows”), urban structures and infrastructures, and appropriate governance forms (Appendix 1). It is also important to recognise their interdependencies, because sometimes different factors contribute to a particular development and sometimes they counteract each other.

The three groups of driving forces distinguished in Appendix 1 (Globalisation, Technology and Demographics & Labour Market) strongly influence the vitality and resilience of urban regions, while specific policy aimed at these driving forces is difficult to implement unequivocally. **“Globalisation”**: International chains in the supply industry result in increasing fragmentation of production and services across different sectors and regions. Transport networks, infrastructure and ICT are needed to bridge this fragmentation. A strategic position in these global networks should give urban regions good international competitiveness. **“Technology”**: While innovation and knowledge economy are key concepts in today’s economic society, they are not so easy and straightforward to measure and promote. Valorisation between knowledge institutions and industry is hampered by conflicting objectives of the two domains and cultural differences that make it difficult to see each other’s points of view. Smart grids, ICT and “big data” can potentially contribute to smart local development opportunities. **“Demographics and the Labour Market”**: The lifestyles of population groups rapidly change in character, with varying household sizes and consequences for housing and migration. An increasing agglomeration of people in urban areas is correlated with depopulation in other regions.

Five interconnected groups of factors that influence the development of urban regions are shown in Appendix 1 (“Structuring Factors”): **“Agglomeration”** occupies a central position: the concentration of people and economic activity leads to economies of scale, which translate into lower transaction and search costs for companies and better opportunities for networking as well as consumer benefits in terms of facilities and access to employment. What also plays a role here, besides the benefits of clustering of companies, is the hub function in networks, the extent to which metropolitan and economic functions can be borrowed from adjacent towns (“borrowed size”) and the

functional and spatial relationship between living and working. The issue of “living” and “working” functions that may or may not follow each other in space and time has long been the backbone of many policies and discussions in urban regions. While many suggest that the living and amenities function of urban regions and their cities have become more important than the working function (“working follows living”), many studies indicate that “working mainly follows working” – the benefits of agglomeration of companies in urban clusters are increasingly becoming a self-organising mechanism of regional development. This has an impact on discussions on government interventions in the area of housing, facilities and accessibility – not only at the level of local government, but also at provincial, national and EU levels (see Appendix 2).

Correlated economic trends are summarised in Appendix 1 under the headings “**Flexibility**” and “**Structural change**”. Transitional labour supply means that employees divide their time over many activities in one day, with a high degree of flexibility. Working, learning, caring, leisure activities – these are increasingly happening at different times and in different frequencies. Lifelong learning and a flexible labour market are known manifestations of this. Self-employed people, who increasingly work from home (where the living and the working environment is the same), are changing the nature of demand and supply of commercial property, commuting and (the capacity of) urban and regional mobility. New concepts are emerging, such as interaction environments (in residential and commercial areas). Another example included in Figure 2 is the divergence between groups of employees, where the middle class is getting smaller compared to classes with higher and lower levels of education. This has implications for cohesion in urban regions. Does this create a new centre with “winners” and a periphery with those lagging behind? The “**Social cohesion**” section summarises trends that focus on individualisation, the desire for experience, health and an “vibrant society” in Dutch cities. This often involves trade-offs with other urban developments. “**Climate and natural resources**” summarises issues which, from that angle, affect urban regional development.

It is clear that urban regional development in relation to vitality and resilience is complex and influenced by many factors. Many factors in Appendix 1 are interrelated and develop together or in opposite directions. But also the way in which policy and governance in urban areas can be made effective is seen as increasingly complex. “Governance” replaces “government”. It is the case that – across different scale levels, in consultation with relevant actors, aimed at developing shared goals consisting of temporary coalitions of stakeholders that vary by issue – generic instruments such as subsidies and prohibitions are increasingly less suited to the local and specific challenges at play. “**Smart governance**” as an ecosystem of policymakers and stakeholders (public authorities but also research institutes and businesses) is the key concept for development – from Europe down to the urban level in the Netherlands.

Urban vitality and resilience: key concepts

In an increasingly complex society characterised by urbanisation and agglomeration and where, in the near future, the goal is to achieve more vitality and resilience with less money and space, a number of key concepts are crucial. Our intention is not to write a handbook on this topic, but we will discuss a number of key concepts and ask the necessary questions regarding policy and governance. The analysis chart in Appendix 3 indicates the factors associated with these concepts.

- Agglomeration power: What determines the economic vitality and resilience of urban regions, for which (groups of) businesses and consumers? How do they develop over time, what opportunities for regions (in terms of agglomeration benefits) are to be expected and where, with what commitment by public authorities, and in which partnerships with research institutions, citizens and businesses?
- Metropolisation: What can relatively small Dutch towns offer each other in their region and in other Dutch regions and peer towns across the border in terms of quality functions, agglomeration power, and commuting dynamism and facilities? Can Dutch cities, in new vital alliances, compete with international metropolises, and what government policy, corporate strategy, and deployment of knowledge institutions is needed at what scale to make this happen?
- Accessibility: In urban regions and in cities, jobs, living environments and facilities must be accessible to everyone. Goods transport must take place efficiently. How can this be achieved with less investment capacity for infrastructure? What is smart and effective accessibility in vital and resilient urban regions?
- Capacity to renew: Which parties in urban regions are capable of and should take the initiative to drive innovation, a sustainable economy, and crossovers within and between top sectors? What are the opportunities and where do they lie, and what are the experiences elsewhere in Europe in this field?
- Capacity to integrate: How do we integrate existing and new activities in the urban region in a sustainable manner? Will this guarantee accessibility, health, capacity for growth and energy efficiency in the future? What smart strategies are needed to achieve this?
- Glocality: The global-local paradox indicates that everything is possible through modern ICT, but that cities act as focal points of international networks of trade, transactions, knowledge and investments. How can local growth potential fully benefit from joining these networks?
- Regulation/deregulation of markets: How can the urban regional labour market, housing market, commercial property market (offices and shops) and land market be adapted to increase future vitality and resilience?
- Transformation tasks: What physical and functional transformations can be made to achieve sustainable, safe, social and healthy urban regions? How does this contribute to the vitality of those regions?

In the SURF research programme these key concepts are central to addressing the social challenges facing cities and urban regions. Research projects should, where possible, address the four aspects set out in the Framework for Vital and Resilient Urban Regions (see Figure 1), clearly indicate how these influence the vitality and resilience of urban regions, and touch on the types of policies that play a role. Although the request can be made in an "open" manner, the paradigm "more with less" has to be applied, and urban

structuring domains will have to redistribute resources and capacities and at the same time make a (greater) quality leap to achieve vitality and excellence. Appendix 5 gives examples of domains and tasks, and suggests where a quality leap might be relevant.

Flows and networks

The activities of people and businesses in urban areas generate multiple flows, especially in the field of information, energy, people, goods and water, and developments in these flows have an impact on urban regions. The analysis chart in Appendix 4 shows which factors are directly related to flows of people, goods and knowledge. All these flows come together in urban regions. Opportunities to facilitate the flows and productively connect them with structures, businesses and people in the metropolitan region are a prerequisite for these regions to function properly. The vitality and resilience of cities also depend on the availability of sufficient energy, transport infrastructure, ICT infrastructure, and water, not just under “normal” circumstances, but also under special circumstances (such as those associated with weather conditions, high peak demand, technical problems in infrastructures, etc.).

On the other hand, those flows need space and sometimes they hamper each other but also the locations of activities in cities. For example, decentralised power generation with wind energy causes shadow flicker and many people do not find wind turbines attractive in urban areas. And although good accessibility is important, roads and railways cause noise, a barrier effect, degradation of the environment and pollution (roads only). Parking requires a lot of valuable space and often affects the living environment. These flows require infrastructure and services, and sometimes need to be mutually aligned. This programme is not about research in the domains of the individual flows, but about the impact of these flows on the vitality and resilience of urban regions.

The programme also focuses on the influence of driving forces in the area of technology, demographics and globalisation on those flows, and the vitality and resilience of urban regions and the determining factors (Appendix 4).

Technology, for example, enables smart grids, often in combination with decentralised electricity generation. Technology also allows cars to self-drive, and may enable underground logistics systems. In demographic terms, changes in the size and particularly the composition of the population (ageing population, an increasing proportion of non-Western immigrants) entail different mobility behaviours and activity patterns (e.g. working from home). Not only do vital and resilient urban regions have adequate services and infrastructure in the fields of energy, ICT, transport and water, these services and infrastructure are also well-matched, both within a category (e.g. aligning and streamlining the components of smart grid/energy systems) and between those categories (e.g. parking facilities for electric cars, which are linked to that smart grid). Globalisation leads to dynamic and fragmented supply chains, with cities seeking a central position in the network. Infrastructures and services should be well-tuned to these hub positions on the one hand and to land use and related activity patterns on the other.

There is currently more knowledge about individual infrastructures and related services than about the **interrelationships** within and especially between the various infrastructures and services and urban social dynamics and structures. Current knowledge about the link between infrastructure types and services on the one hand and activity locations on the other is piecemeal. We know more, for example, about the link between spatial planning and (infrastructure for) passenger mobility than the link between spatial planning and (infrastructure for) goods transport. Moreover, there is little knowledge about the influence of driving forces and determining factors (Appendix 1) on developments in the joint infrastructures and services, and subsequently the impact of developments in infrastructures and services on the vitality and resilience of urban regions. Research is needed into the implications of these developments for the vitality and resilience of urban regions, how urban regions in the Netherlands score in this respect (including a comparison with competing foreign regions) and what indicators of vitality and resilience of urban regions are the most important when it comes to developments in networks, infrastructures and services. Governance issues are also pertinent, such as the role of private and public parties in the development of infrastructure and services: when does top-down governance of infrastructure and services work best and when does bottom-up governance work best? Which urban functions make which changing demands on structures, infrastructures and services?

For the SURF research programme it is essential that the flows and network dimension in relation to spatial structures and infrastructures is elaborated into research questions that contribute to the vitality and resilience of Dutch urban regions in Europe.

Spatial structures and infrastructures

Dutch cities show the history of our country: the buildings and infrastructures, the centrally positioned stations, and the highways and canals. They also show the spatial structure of cities: centrally located shopping areas, easily accessible hospitals, uniform residential areas and office buildings located near highways are all the result of social choices in the past. Looking at Europe in Google Earth, the specific pattern of urbanisation in the Netherlands and Western Europe is noticeable: a polycentric conurbation and much smaller urban areas in the rest of the Netherlands, veined and separated by greenery and water. This spatial structure is not only a reflection of the past; it also influences future developments in our economy and society. Economy and society place new demands on the spatial arrangement of a city. New demands can be partially accommodated through renovation and transformation of existing spatial structures. Furthermore, new spatial structures will arise. Accelerating and scaling up renovation, transformation and renewal are challenges for the future that are associated with many urban factors (see Appendix 5).

In the built environment, this involves major **investments**. For example, Dutch pension funds have invested around 22 billion euros in Dutch property. Dutch banks have also invested heavily in property. Citizens and businesses own the rest. Most of the buildings and infrastructure dates from after the war. Buildings and infrastructure are subject to ageing, both in structural and functional terms. Major structural investments will have to be made in the coming years. Functional obsolescence of buildings is related to changes in the economy (e.g. outsourcing of administrative work to foreign countries, emergence

of the New World of Work, rise of the internet – see Appendix 1). These changes have led to a substantial vacancy rate of office and retail buildings which has been exacerbated by the economic crisis. Dutch infrastructures are also ageing. National infrastructures are making way for infrastructures with a more decentralised structure (e.g. energy systems, water supply for urban functions and logistics infrastructure). Infrastructures are getting smarter (roads, sewers, energy networks, etc. are equipped with sensors and are part of “the internet of things”) and infrastructures are becoming more integrated (e.g. in “solar roads”). The principles that underlie the existing spatial structure (specialisation, economies of scale, creating agglomeration benefits, commuting dynamics, accessibility of facilities) have changed considerably with the emergence of the information society. Everyone is connected to everyone and everything, everywhere. Yet cities remain the focal point of increasing economic and social dynamics. The transitions needed in the built environment to link up with the relevant networks and flows (on many scales) must be able to accommodate rapid functional obsolescence of buildings, infrastructure and spatial structures. Such developments call for new investment or intelligent integration and applications of urban functions when more has to be achieved with less (“more with less” requirement). The necessary and smart investments in existing spatial structures (with the greatest enabling capacity and flywheel effect) have yet to be identified. Much research has been piecemeal, and often the impact of measures and influencing factors is unknown.

Traditionally, the spatial structure of our country has been influenced by the **government**. First this was through our struggle against the water, and later through the Housing Act, which was aimed at creating a healthy living environment and, since the 1960s, through integrated spatial planning concepts such as growth centres, urban nodes, key projects and “transit-oriented development” – introduced with varying degrees of success but with a permanent impact on the spatial structure. What is of interest in this programme is the relationship between planning policy and policy on economic and social vitality and resilience. Policies at the interface between economic vitality and spatial planning of urban regions have changed in recent years. An analysis of the policy documents of roughly the past 30 years shows that changes in the spatial structure aimed at enhancing the vitality of cities were initially focused on investments that increase attractiveness for companies: accessibility, availability of sufficient office space in easily accessible areas, development of business parks in relation to mainports and creating an attractive living environment in the Randstad. In recent years, the focus has shifted. Instruments are now focused primarily on creating ecosystems for specific industries (top sectors and “smart specialisation”). Public authorities, research institutions and businesses work together to strengthen the local economy and increase the competitiveness of established businesses. The success and failure factors for this type of cooperation have yet to be identified, and there is no overview of the spatial and functional relationships of these new ecosystems. In addition to smart design and smart networks, smart governance is needed to facilitate the social dynamics of the urban regions of tomorrow.

Smart governance

Glocalisation is a term indicating that the advent of the network society is not just about globalisation but also localisation: the capacity of cities, regions and countries to develop competitiveness and thus maintain and possibly strengthen their global position. In cities and urban regions, self-organising **capacity** is an important explanation for and driving force behind competitiveness. Self-organisation, however, is only part of the story – governance is the complementary part. Governance concerns the ability of actors to drive these forces while ensuring an acceptable distribution of wealth. Governance includes various public authorities at multiple levels, as well as private organisations, knowledge institutions and citizens. The concept of governance recognises that smart urban development has largely become dependent on the development power of the region involved and that this development power can take on various forms. Industrial and agricultural networks used to be the most important ones for the city, but now networks of cultural exchange, daily traffic flows, exchange networks of highly educated and creative workers, care networks, etc. are as important.

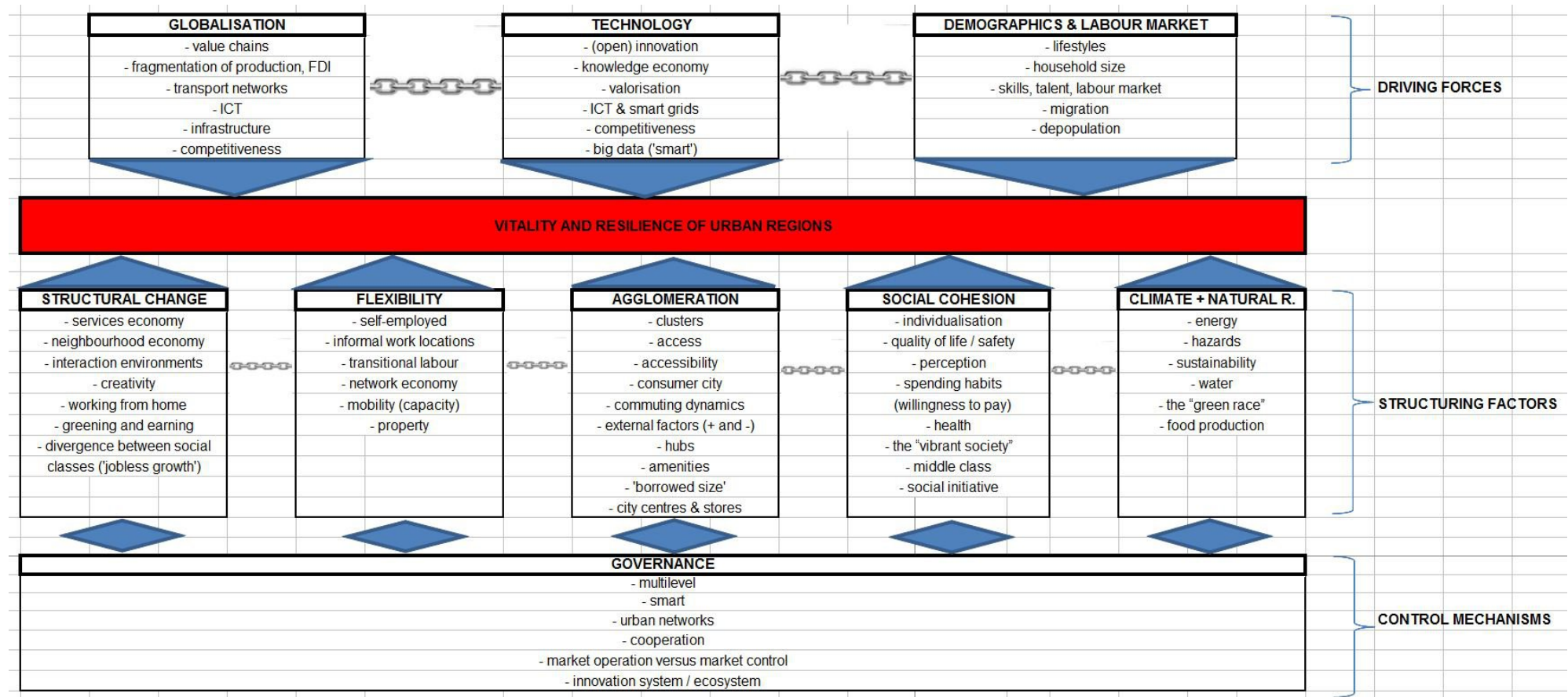
The survival and development of urban regions also highly depends on the development of the country and the continent in which they are located. It is beneficial for each city in the Netherlands if the strength of the country and of the EU is high, and if actions at these levels reinforce the position of the urban regions. New theories and practices of **multilevel governance** are emerging. These theories are about traditional government as well as citizens and businesses. Smart governance is about the ability to develop smart interfaces between the various layers of governance without incurring spiralling transaction costs. Everyone should do what they do best, but in a way that is mutually reinforcing to achieve vitality and resilience. In line with the concept of glocalisation, “governance capacity” mainly refers to the ability of a number of parties to seize the opportunities for competitive advantages and to recognise the threats and address these effectively as a coalition. Governance therefore focuses less on the choice of the most effective level of government to make decisions and more on the capacity at various levels to make decisions that serve interests at that level while dovetailing with and reinforcing decisions at other levels.

This SURF programme focuses mainly on smart sets of joint action for the development and management of smart infrastructures and smart economic and physical networks that are conducive to economic growth and social dynamics. This poses major challenges to public authorities, as they have a long tradition of task-oriented performance focused on their own domain (their own city, for example) or on a specific task (flood protection, water supply, road infrastructure, public transport, etc.). All these parties have their self-defined policies and tend to consider a public authority in another domain or area of responsibility as the competitor. It is often the case, therefore, that initiatives by businesses and citizens are rejected by public authorities because they “are not in line with policy” or do not fit in their own planning. This overhead-centred approach assumes that politics determine which social issues become political issues. Once a public authority has a policy, each initiative is assessed on the basis of that policy. For a long time this was the predominant thinking of and in public authorities, but also government theories, organisational theory and decision-making theory. Guidance and control were and still are the main area of focus.

The disadvantage of this approach, however, is its relatively slow pace. Going through the policy cycle is often a slow process which is strongly focused on internal logic and preferences. This way of working does not lend itself to a rapid response to change, whereas this is precisely what is needed to increase competitiveness. To respond to unexpected opportunities and threats in a smarter way, public authorities must adapt more quickly. **Adaptability** includes both the resilience to withstand setbacks and the vitality to take up new, promising ideas. It would appear that the challenges facing the public sector are more akin to those facing the business sector than is sometimes realised. So adaptability in terms of vitality and resilience is a new concept against which to test government actions in addition to traditional values such as transparency, efficiency and legitimacy. Administrative power is no longer just about the power of each of the individual organisations, and no longer simply whether an organisation performs the agreed tasks (ideal task performance and goal achievement). Administrative power is also about adaptability. **Smart governance** in relation to networks and infrastructures is about balancing the public provision of basic quality services to all citizens and businesses in all regions in a supply-oriented manner (generic policy with efficient service and investments) with allowing and facilitating variations and diversity (customisation) that make it possible to seize opportunities in areas where they present themselves. Adaptability across the boundaries of various infrastructures is an explicit component of the challenge for researchers in this SURF programme.

Self-organisation generates the basic elements of vitality and resilience. At the same time, it raises two new intriguing questions. The first relates to what public authorities are already doing to boost and exploit self-organisation that contributes to vitality and resilience, how effective these public authorities are, and how they could do this in a smarter way. The second concerns the new form of governance in which traditional government tasks are integrated: how can public authorities prevent self-organisation and networking from losing transparency and becoming liable to abuse? In the SURF projects governance systems will be subject mainly to “outside-in” analysis. What are the challenges for urban regions and the public authorities responsible for regional development (in conjunction with citizens, businesses and research institutions)? What are the characteristics of existing governance systems and how suited are they to respond to emerging challenges and threats? What changes are needed to balance government action with the vitality and resilience of regional systems? In SURF, the governance focus is on traditional infrastructures, but also and above all on what happens in the “spaces of flow” that use these infrastructures. Urban regions are a space of flows that need to be managed in a smart manner. The question, therefore, is also what the potential transitions to more sustainable infrastructures and flows are, and what public authorities can and should do to contribute to this. Governance models that are capable of meaningfully combining centralisation and decentralisation are becoming increasingly important, for it is precisely in a trend of glocalisation that centralisation and decentralisation coincide. Smart governance is thus also the ability to create selective connections between parts of the complex government structure. The SURF programme is aimed at facilitating steps to take at this very early stage of discovering a new smart governance reality.

Appendix 1: Vitality and resilience of urban regions: correlation between driving forces, structuring factors and control

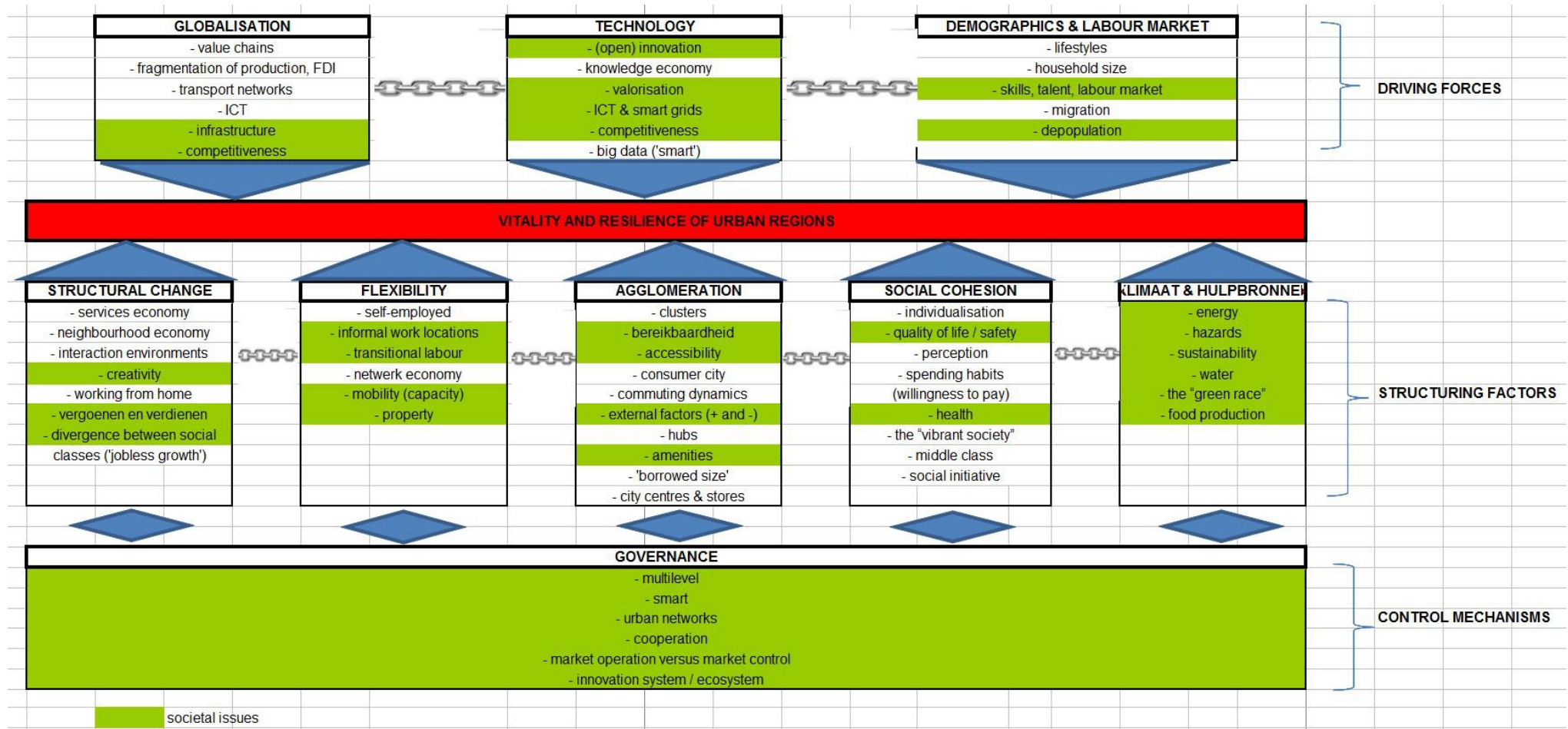


Appendix 2: Forms of cummting dynamics on an urban scale

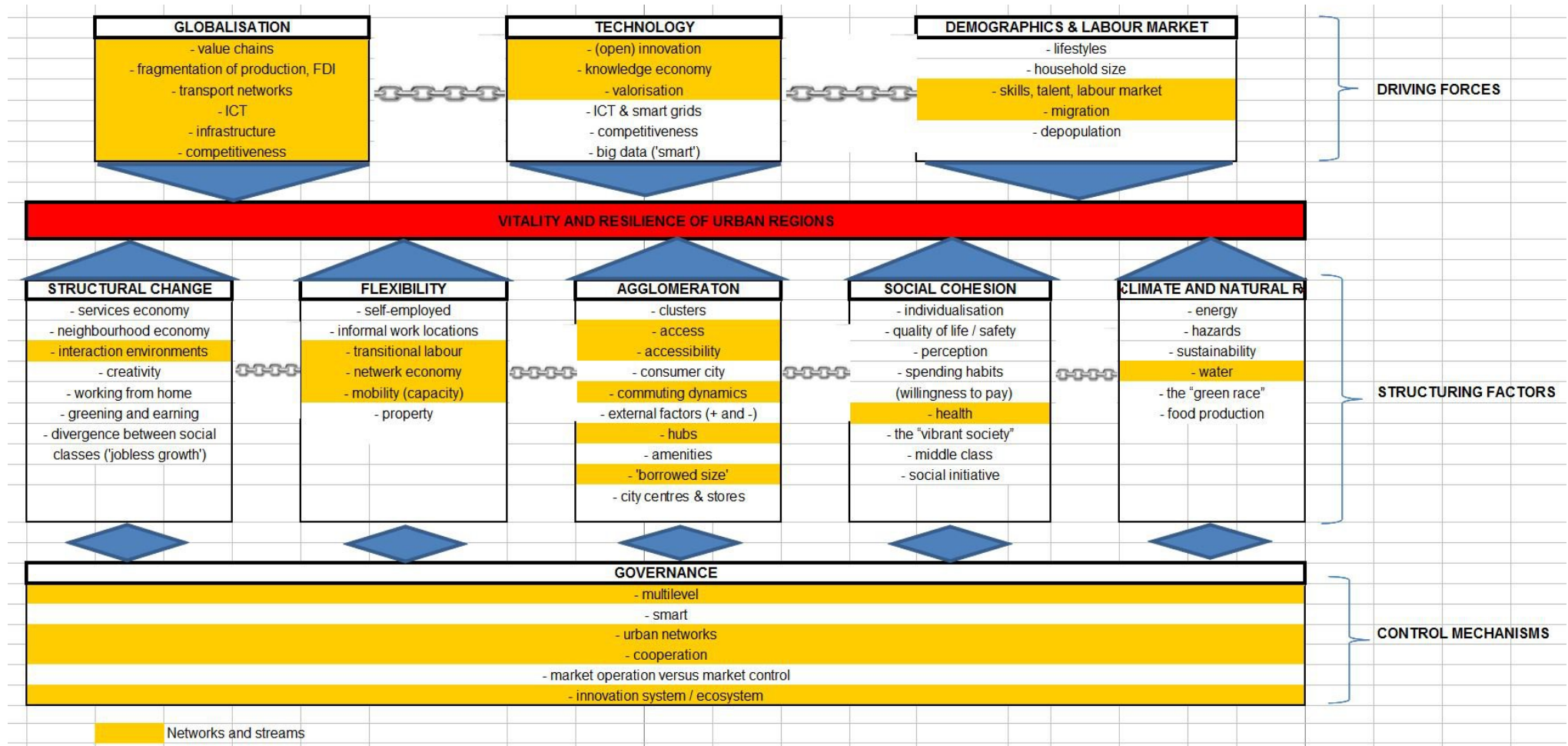
| | National | Urban Regions | Cities | City Districts |
|------------------------------|-----------------------------|-------------------------------|---------------------------------------|--------------------------|
| Structuring factors | | Commuter Dynamics | | |
| | | Quality of Jobs and Workforce | | |
| | | Housing and Planning Policy | | |
| | | | | |
| Living follows Work & Study | Accessible Jobs | | | |
| | Educational System | | | |
| | Institutions and Governance | | | |
| Work follows Work | Intern. Competetiveness | | | |
| | Foreign Investments | | | |
| | Top Sectors | | | |
| | | Innovation | | |
| | | Related Skills, Clusters | | |
| | | Labour Market | | |
| | | | Agglomeration Advantages | |
| | | | Working Env., Industr. Sites | |
| | | | Science Parks | |
| Work follows Living | | Growth Centers | | |
| | | Suburb. People and Jobs | | |
| | | Accessibility, Urb. Network | | |
| | | | Creative Class, Living Environments | |
| | | | Amenities, Working-Living Evironments | |
| | | | Care Services | |
| | | | Self-employed | |
| | | | | Interaction Environments |
| Work and Living don't Follow | | | | Corporations |
| | | | | Structural Improvements |
| | | | | Target Group Policy |
| | | | | Neighb. Economy and Coh. |
| | | | | Local Activation |

(Source: After Van Oort e.a. 2013, p.7)

Appendix 3: Factors that relate to societal issues (next to vitality and resilience)



Appendix 4: Factors that relate to flows and networks



Appendix 6: Examples of redistribution and quality leap of urban markets and space

| | Domains and issues | Redistribution | Quality leap |
|---|-------------------------------------|--|---|
| Labour market | Demand of labour | Equal quantity of work spread over more individuals | Knowledge economy, 'Nieuwe Werken' |
| | Supply of labour | Participation spread over more categories of supply | Transitional labour, the energetic society |
| Real estate market | Demand of real estate | Less growth of space spread over more companies and less shops | 'Experience economy', restructuring, attractive innercity |
| | Supply of real estate | Differentiation in supplying parties, (de)regulation | Flexible space |
| Housing market | Demand of housing | Agglomeration, population decline | Residential environment, amenities, consumer city |
| | Supply of housing | (De)regulation, upgrading | 'Vrije Wonen', diversity, restructuring |
| Mobility and spatial development | Spatial processes | Scaling connects more areas | Polycentric urban agglomerations, metropolitization |
| | | Fragmentation in the city in time and space | Smart grids & design quality of life |
| | Mobility | Multi purpose and global-local | Transfer points, hubs interaction environments |
| | Spatial, social and economic policy | More regional actors simultaneously in more domains | Regional anchoring strategies, multi level and smart governance |

Appendix 7: References

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