WHITE PAPER N°3

# The 15-minute City model :

## an innovative approach to measuring quality of life in urban settings

30-minute territory model in low density areas



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# INTRODUCTION

The increasingly visible manifestations of climate change are impacting our urban and territorial lives. Our lifestyles, in the Anthropocene era, are worsening this crisis day by day. The COVID-19 pandemic has had a global impact on our way of life, work, and mobility patterns. The war in Ukraine is bringing new constraints and reinforcing the sense of urgency for change. With the energy crisis, inflation and difficulties with certain supplies, the calls for a more local way of life, with less dependence and more sobriety, are multiplying in France, Europe and the world.

How can we reconcile a more frugal, more sustainable way of life, in line with ambitious decarbonisation objectives for a net zero by 2050, with the need for a better quality of life for all? The various surveys conducted show that citizens' expectations are changing in terms of their perception of the quality of life. COVID-19 has also established other rhythms in the relationship to work. Access to green spaces and safety[1] are also part of the wishes for this new period, full of distress and eco-anxiety.

A wave of change is happening all over the world, questioning our way of life, and calling for an approach to facilitate access to local services in a city or territory that is becoming polycentric.

This proposal, paraphrasing Pascal, "a sphere of which the centre is everywhere and the circumference nowhere", is at the heart of the new reflections and actions behind this major question: in which city, in which territory, do we want to live?

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[1] Observatoire de l'Habitat, *Que signifie "habiter mieux" pour les français ? rapport du sondage Obsoco*, Nexity, Somfy, Groupe Caisse des Dépôts, mars 2019.

Faced with this observation, it seems necessary to reimagine the daily life of city dwellers in order to reconcile a better living environment and better accessibility to local services in the heart of territories and cities. This is what we are proposing with the "15-Minute City", the urban model, and the "30-Minute Territory", the territorial model, by aiming to link urban and territorial life with a High Quality of Societal Life index. The 15-Minute City and the 30-Minute Territory concepts lead to another organisation of the use of the city and territories with a polycentric vision, in hyper proximity. It is a question of offering, in any place and at any time, the different urban or territorial functions that meet the essential needs of the inhabitants, while consuming fewer resources and preserving useful personal, family, neighbourhood and social time.

This approach to proximities generates a reduction in forced and arduous commutes, which are mainly journeys between home and the workplace or home and the place of study. In this respect, the 15-Minute City and the 30-Minute Territory models are in line with the work on demobility by Julien DAMON[2] and Bruno MARZLOFF[3]. Both advocate a reduction in forced mobility and an improvement in chosen mobility by revising our current hypermobility model. The future of transportation (energy dependency, climate change, changes in work, ICT) also argues in favour of this demobility. The pandemic has called into question the classic working day with fixed hours. This is also visible in France, where 80% of workers say they are interested in the possibility of arranging their working hours to suit themselves (compared to 64% in the rest of the world), according to the *BCG/The Network* survey of 208, with 807 workers from 190 countries, including France[4]. Even employees who do not have access to paperless work are looking for another meaning to their commitment and questioning the relevance of a job with a very high work-life imbalance. Indeed, a new BCG study[5] entitled *"Why Deskless Workers Are Leaving-and How to Win Them Back"*, based on a survey of 7,000 *deskless workers*[6] in seven countries (France, Germany, the UK, the US, Australia, India and Japan) estimates that in France, 1/3 of these workers are leaving. The term *"Quiet Quitting"*[7] has emerged with this new trend where more and more people are voluntarily leaving their jobs and reorienting themselves, while companies are no longer able to fill the vacant job positions.

The issues are manifold: organisation of work (relocation of jobs, remote work, desynchronisation, desaturation), urban form (compactness, despecialisation), control of commerce (diversification, circular economy, short circuit) and digitalization (e-commerce, e-medecine, teleworking).

As far as transportation is concerned, the answer lies in enriching the supply of shared, low-carbon, accessible forms of collective mobility, with the co-benefit of regaining expensive urban areas to create nature based public spaces and slow traffic zones . This is opposed to the promotion of forced, segregative and regressive immobility, such as that experienced and suffered during the Covid-19

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[2] DAMON Julien, *La démobilité : travailler, vivre autrement*, in : Innovation Politique 2014, p 246 à 275.
[3] MARZLOFF Bruno, *Sans Bureau Fixe*, FYP Éditions, 2013, 96p.
[4] Decoding talent 2021, BCG, March 2021
[5] Future of work Deskless survey, Sentiment survey, BCG July 2022
[6] The term *"deskless workers" refers* to those workers who have to be physically present to carry out their work and therefore do not have the possibility to telework, such as drivers, hairdressers, nurses, labourers etc. They represent 75% to 80% of the wage bill in the countries analyzed. They represent 75% to 80% of the wage bill in the countries analyzed.
[7] Majority of workers who quit a job in 2021 cite low pay, no opportunities for advancement, feeling disrespected, Pew Research Center, March 9, 2022

lockdown. "Reasoned demobility" aims for an urban optimum where chosen, high-quality travel enables everyone to access essential urban functions.

Urban functions are understood as the provision of infrastructure and services necessary for social, professional, and extra-professional life. Our approach to infrastructure is that of 'social infrastructure', as practised by many architects and planners around the world. An approach guided by the presence of facilities that are defined by their social use, versatility, and adaptability. Our proposal is rooted in this definition of social circularity, linking essential functions to guarantee a High Quality of Societal Life. These functions reflect the use of a city by its inhabitants and are linked to concrete facilities and places.
In contrast to the urban specialisation inherited from the functionalist movement, we propose another approach, both spatial and temporal, to create a new balance in the use of the city based on facilities that are associated with multi-purpose services in the urban space, giving priority to accessibility in proximity. In line with the 'Brussels Declaration' we believe that multi-functional spatial organisation is a central element in our challenges, as it determines the social, spatial and temporal content at the centre of our way of life in the city and is thus consubstantial with the quality of life. Temporality changes the perception of availability with a offer in capacity, intrinsically favouring short distances, low-carbon travel and the connectivity of places through decarbonised mobility, on foot, by bike, or with public transport, in multimodality.

The High Quality of Societal Life offered to the inhabitants of the "15-Minute City" and the "30-Minute Territory" is defined by the accessibility, either immediate, or at least optimised in the space/time pairing of all six social functions: **living, working, getting supplies, caring(being healthy), learning and enjoying.**

The High Quality of Societal Life is ensured by a functional and social mix that must allow for diversity and intensity of urban life. For many decades the city has become a melting pot of segregation, fractures, and exclusions. The "vice" of long distances has become established, individual car travelling, moreover with diesel and with a single occupancy vehicle use, has become the "tobacco" of inhabitants, and the waste of time in long and tedious journeys has become the "normality".

"Losing one's life to earn it" through accelerating productivism, dehumanising daily life and leaving aside the quality of social life. The question we must ask ourselves is: how have we accepted the unacceptable for so many decades?

Jane Jacobs refers to the "living city" as one *"where at any time and in any place, we have a multiplicity of choices"*[8], without relying on the use of the individual car.

It is in this perspective that the consideration of a different relationship between urban and territorial space and the time needed to satisfy societal functions holds the promise of a more sustainable, viable

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[8]   Jacobs Jane, *The Death and Life of Great American Cities*, New York, Random House, 1961

and liveable living environment. Finally, the accessibility of these functions transcribes their necessary spatialisation and allows an easy and pleasant practice of the territory.

The expression of the quality of life in a territory is often based on an individual subjective assessment. In order to objectively measure the quality of life, it is necessary to study its urban and territorial functions within a societal framework. This objective approach makes it possible to consider the city and the territory in terms of its potentialities and shortcomings through the presence or absence of elements identified as generating quality of life. The analysis of societal functions is based on statistical and algorithmic calculations capable of producing precise knowledge of living environments.

In an urban or territorial project, governance or planning process, this very concrete approach makes it possible to characterise a space and monitor its dynamics, in order to act and improve the living environment of individuals. Within the framework of the implementation of 15-Minute Cities and 30-Minute Territories, social functions are studied using a new method and translated into data.

The purpose of this white paper is to situate this approach of analysing the High Quality of Societal Life (HQSL) by firstly proposing the various methods and approaches that exist to measure quality of life. Then he two following chapters cover the sets of methods, tools and case studies illustrating this innovative urban and territorial strategy.

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# PART 1:
# REVIEW OF URBAN AND
# TERRITORIAL INDICATORS

# I/ EXISTING APPROACHES TO MEASURING QUALITY OF LIFE

The theoretical and methodological framework for measuring quality of life is dominated by two approaches: an objective approach, based on the analysis of available data, and a subjective approach, based on the collection and evaluation of individual perceptions. Here, we only deal with the objective measurement of quality of life, based on indicators.

## 1.
## THE MAIN INDICATORS USED BY THE INTERNATIONAL COMMUNITY

Between the end of the Second World War and the end of the 20th century, the newly formed international community developed various indicators to measure the situation of countries in the world. Influenced by economic and military approaches to international diplomacy, these quantitative approaches constitute tools for apprehending and rationally understanding very diverse contexts. The quantity and quality of indicators have gradually increased, evolving with social developments. The question of quality of life has become an issue of interest, as have environmental issues. These international statistics are intended to be illustrative and comparative, but also to be used for decision-making. For example, these can be used as an indicator in the need for international action in development aid. The purpose of this section is to present a selection of indicators used to report on quality of life and urban quality of life.

**1.1. Gross Domestic Product (GDP)**

**Gross Domestic Product** (GDP) is the most widely used measure of economic activity in the world. It is determined by international standards and is the result of extensive work defining its statistical and conceptual bases. It is an indicator that was first developed by American economists and is now accepted as an indicator of progress and national development by the international community after the Second World War.

Today, **it is often used as a measure of a country's well-being, which is illusory** because measures of economic performance and living standards are insufficient to reflect the well-being of a population. Indeed, well-being is not only economic: it is multidimensional and depends on living conditions, health, education, personal activities, political participation,

social connections and relationships, the environment and insecurity[9]. This comment by the Commission on the measurement of economic performance and social progress highlights the close link between well-being and the living environment. GDP fails to reflect the quality of life of a country or territory, as a space offering a set of possibilities to citizens and the freedom to choose the type of life they want in this space - i.e. their **capability** in Amartya SEN's sense. Complementary indicators have therefore been developed to overcome the limitations of GDP.

**1.2. Human Development Index (HDI)**

**The Human Development Index (HDI)** was developed by experts of the United Nations Development Programme (UNDP) as a complement to GDP in the early 1980s. It gives an account of human development by a measure that is not limited to economic development and that apprehends a level of individual and collective well-being integrating the dimensions of education and health. It thus provides a better understanding of quality of life by combining GDP with other more qualitative data. It synthesises three sets of data:

**Health/longevity:**
measured by life expectancy at birth. This indirectly measures the satisfaction of basic material needs : safe food, clean water, decent housing, good hygiene, medical care.

**Knowledge/education:**
measured by the average length of schooling for adults over 25 years, the expected length of schooling for school-age children, the literacy rate. This index shows the satisfaction of intangible needs and the ability to participate in decision-making in society.

**Standard of living:**
logarithm of gross income per capita in purchasing power parity. It allows for the inclusion of elements of quality of life that are not described by the first two indices, such as mobility and culture.

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9   Report of the Commission on the Measurement of Economic Performance and Social Progress, p.7

## HDI DEVELOPMENT



**DIMENSIONS**

LONG AND HELTHY LIFE

KNOWLEDGE

A DECENT STANDARD OF LIVING

**INDICATORS**

Life expectancy at birth

Expected years of schooling

Mean years of schooling

GNI per capita (PPP $)

**DIMENSION INDEX**

Life expectancy index

Education index

GNI index

Human Development Index (HDI)
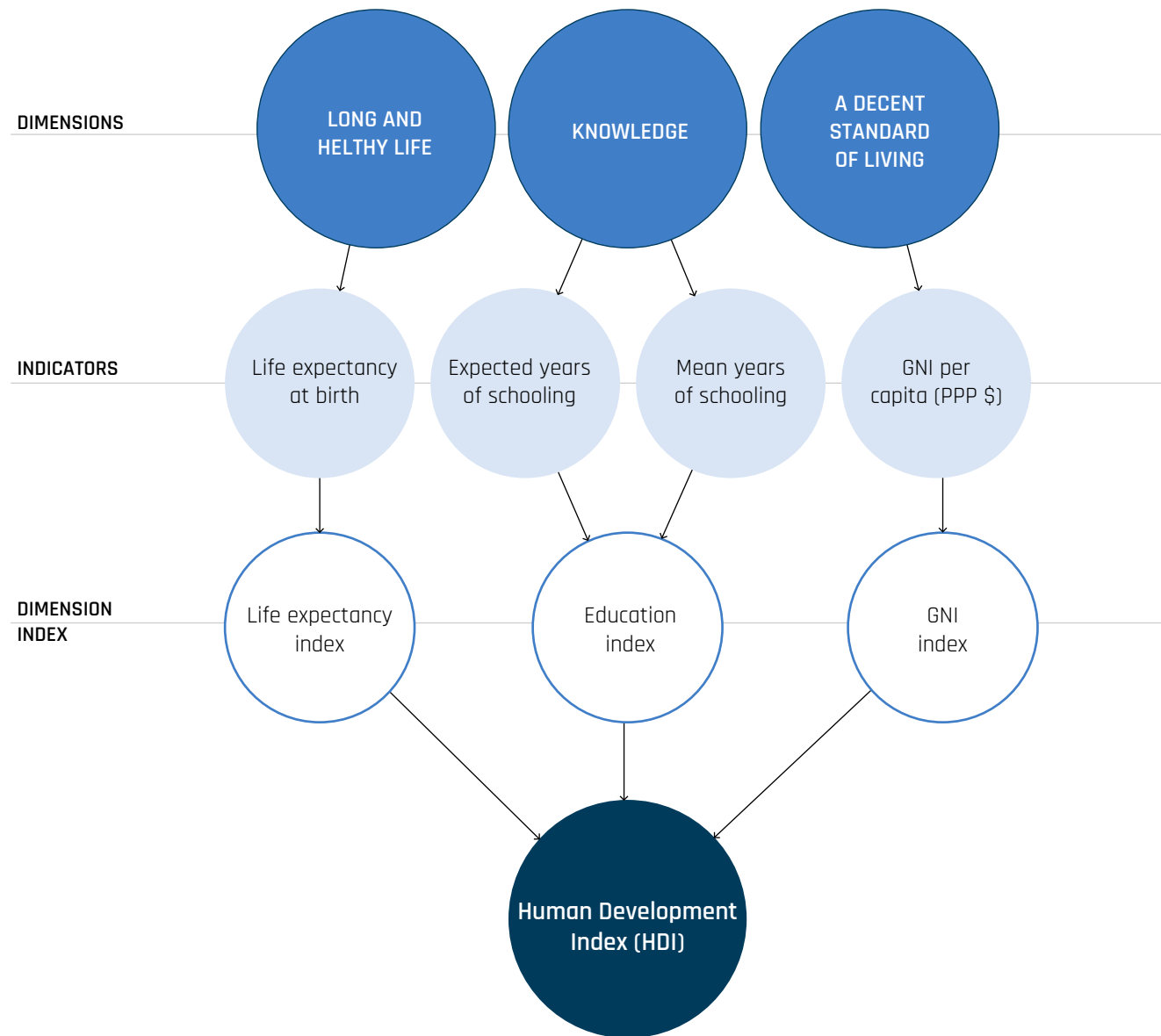
**Figure 1** HDI development - United Nations Development Programme

The HDI is presented as a unitless number between 0 and 1. The closer it is to 1, the higher the level of development of the country. This number is the simple average of the three indices, constructed from indicators standardised between 0 and 1. For each indicator the floor rate set is equivalent to 0, the ceiling rate is equivalent to 1 (fig.2).

The HDI is used at the international level, where its results are interesting because they differ from those of GDP[10]. An annual ranking of countries is produced. For example, France has an HDI of 0.891 and is ranked 39th out of 189. Norway is ranked 1st with an HDI of 0.957. Niger, the last country in the ranking, has an HDI of 0.394[11].

### HUMAN DEVELOPMENT INDEX, 2017

The Human Development Index (HDI) is a summary measure of key dimensions of human development: a long and healthy life, a good education, and having a decent standard of living.



No data   0.1   0.2   0.3   0.4   0.5   0.6   0.7   0.8   0.9   1
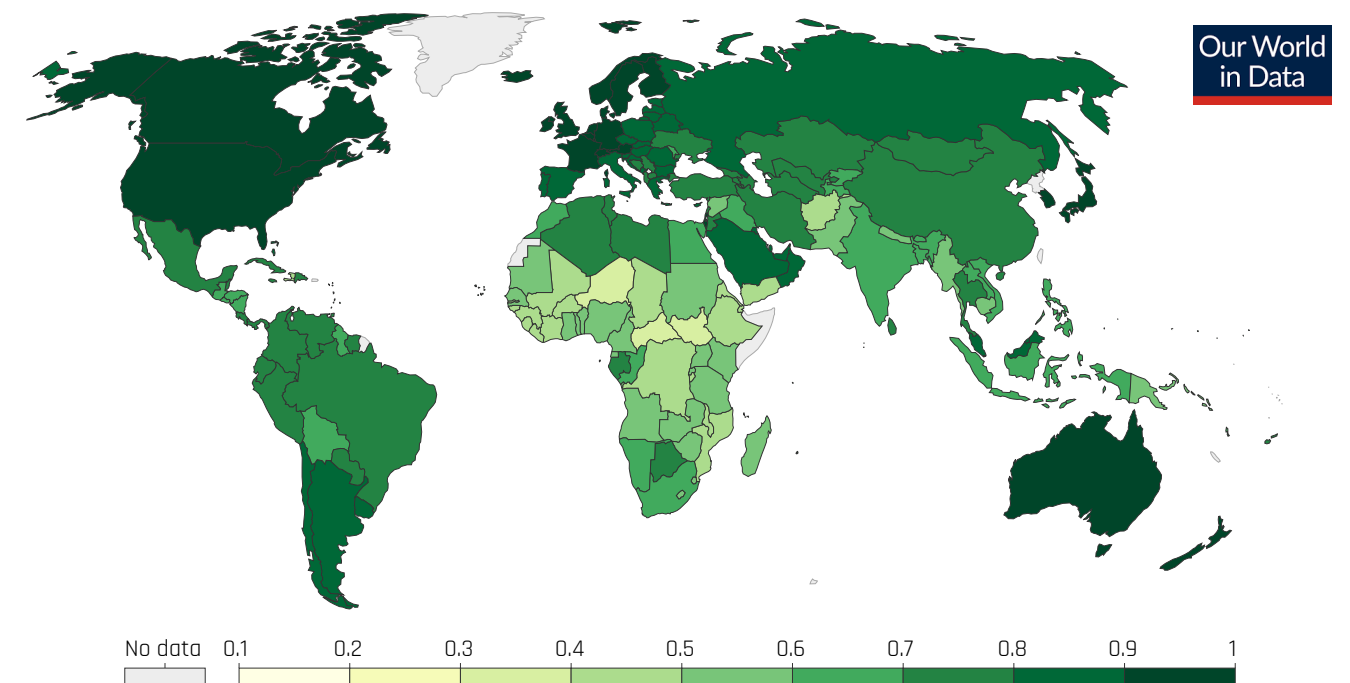
**Figure 2** Human Development Index 2017 - UNDP | Map: OurWorldInData

At the sub-national level, the HDI presents difficulties that are related to

- Unavailability of data at lower scales [12]
- A loss of significance of the indicators at this scale
- A method of standardisation that is not very suitable for developed countries and regions because it is not very discriminating. With this method of standardisation, there are few differences between the areas studied (around 10% in France).

[10] Note that it was largely constructed to provide an alternative measure of development to GDP, so this finding is not surprising.
[11] Development Report 2020, *The Human Development Indices*, pp. 18-21, http://hdr.undp.org/sites/default/files/hdr_2020_overview_french.pdf.
[12] The assumed equality "GDP = Production = Consumption" is not valid at the local level, for example, since it is much more difficult to estimate imports and exports between different localities in the same country or region.

Moreover, it does not allow a fine analysis of territories and disparities in the distribution of human development, as it is a simple general average. And it is unsuited to the permeability of regional boundaries (e.g., IDF, GDP) and lacks relevance of indicators in developed countries (e.g. literacy rate).

To overcome these difficulties, experiments have been carried out in some French regions and cities. In Greater Lyon, the Centre-Val de Loire region and Ile-de-France[13], an HDI-2 has been created as a sub-national alternative to the HDI (fig. 3 & 4). Occitanie also experimented with the implementation of a local HDI in 2017[14].

This local version retains the same architecture and the same calculation method, with some adaptations.

It mobilises data available at the communal or inter-communal level by focusing on three sets of data:

- Access to health: life expectancy at birth
- Access to education: share of people over 15 years of age who have left the school system with a diploma
- Standard of living: median value of household tax income.

These indicators are standardised on the basis of their distance from the highest and lowest reference rate, which makes it possible to calculate an average. The HDI-2 has been broken down to the regional and departmental levels.

- L'IDH
- L'IDH-2
- Perspectives

## AN ALTERNATIVE, THE HDI 2: SAME DIMENSIONS...
different normalisation and indicators



**3 DIMENSIONS**

| Health | Education | Living Standards |
|---|---|---|
| Ability to enjoy a long and healthy life | Capacity to access education and knowledge | Ability to access a decent (material) standard of living |

**3 INDICATORS**

| Life expectancy at birth (men and women) | % adult population graduated | Household tax income per person |
|---|---|---|

**3 INDEX NUMBER STANDARDISED FROM 0 TO 1**

| Health index | Education index | Living standard |
|---|---|---|
| upper limit: 85 years lower limit: 65 years | upper limit: 100% lower limit 50% | index upper limit: 25,000 lower limit: 5,000 |

...and a final index number, ranging between 0 and 1

HDI 2 = (health index + education index + living standard index)/3

**Figure 3** Presentation of the indicators used for the HDI2 - Aurélien BOUTAUD, Terr(e)itoires
https://www.aurm.org/uploads/media/ed4f1b1e4aa0abc759748feaecdc0013.pdf

The HDI-2 has the advantage of being a synthetic index, relevant in developed countries, more discriminating and qualitative than the HDI and which allows for local comparisons and precise mapping.

However, the HDI-2 does not reflect human development but rather a social configuration of the population. It reflects the social disparities in the area of analysis, taking into account the three dimensions of health, education and income.

[13] https://www.institutparisregion.fr/nos-travaux/publications/les-indices-synthetiques-du-pnud-idh-iph-ipf-en-region-ile-de-france.html
[14] What level of human development for the territories of Occitania? Observatoire partenarial de l'environnement et socio démographie, July 2017

## DISTRIBUTION OF REGIONS IN METROPOLITAN FRANCE ACCORDING TO THE HDI2

The HDI-2 also present several limitations. Limitations in its use, as at the municipal, departmental, and regional levels, the concept of human development is not necessarily appropriate, since economic development, education and health systems are the responsibility of the State, or even the regions, and less so of local arbitration.

Limitations in its recognition, as it is primarily an index without international recognition.

Secondly, there are limitations in the calculation. The latter presents a certain subjectivity in the choice of data, normalisation, aggregation. Finally, there are limitations in the scope of this index. There are only three components, which limits its scope, as some dimensions are not taken into account.



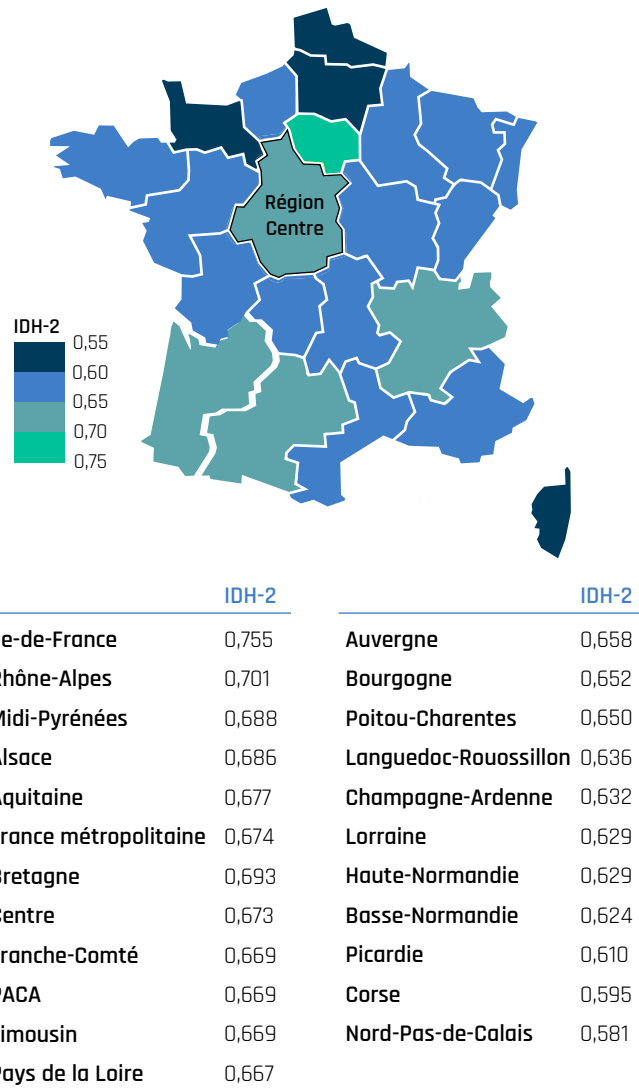| | IDH-2 | | IDH-2 |
|---|---|---|---|
| Ile-de-France | 0,755 | Auvergne | 0,658 |
| Rhône-Alpes | 0,701 | Bourgogne | 0,652 |
| Midi-Pyrénées | 0,688 | Poitou-Charentes | 0,650 |
| Alsace | 0,686 | Languedoc-Rouossillon | 0,636 |
| Aquitaine | 0,677 | Champagne-Ardenne | 0,632 |
| France métropolitaine | 0,674 | Lorraine | 0,629 |
| Bretagne | 0,693 | Haute-Normandie | 0,629 |
| Centre | 0,673 | Basse-Normandie | 0,624 |
| Franche-Comté | 0,669 | Picardie | 0,610 |
| PACA | 0,669 | Corse | 0,595 |
| Limousin | 0,669 | Nord-Pas-de-Calais | 0,581 |
| Pays de la Loire | 0,667 | | |

**Figure 4** Distribution of regions in metropolitan France according to the HDI2 - Aurélien BOUTAUD Terr(e)itoires

### 1.3. Gross National Happiness (GNH)

**Gross National Happiness**, conceived in 1972, aims to define the standard of living in a country in a holistic way and in a psychological and humanistic dimension. Its four pillars are the **promotion of a socially equitable society and economic development**, the **safeguarding and promotion of cultural values, the protection of the environment and the establishment of good government and administrative structures**. However, many of its indicators depend on subjective judgements, a limitation that is open to criticism.

### 1.4. Sustainable Well-Being Index (SWBI)

**The sustainable well-being index** focuses on the destructive effects of an unhealthy environment (H.E. DALY and J.B. COBB, 1991) by taking into account the negative externalities of production aimed at replacing GDP. It considers the market consumption of households, domestic labour services, non-defensive public expenditure, defensive private expenditure, costs of environmental degradation, depreciation of natural capital and productive capital formation. It therefore takes several dimensions into account to measure the wealth produced, unlike GDP, and gives orders of magnitude.

## 2. OECD INDICATORS

On a smaller scale of international cooperation, the Organisation for Economic Co-operation and Development (OECD) is also developing its own indicators to measure quality of life. These indicators help to understand and act on the quality of life of its 37 member states[15]. The indicators on urban issues are developed by the experts of the Cities, Urban Policies and Sustainable Development Division. It should be noted that the OECD indicators are adapted to the member states, which are mainly so-called developed countries. They are indicators that correspond more closely to the living conditions of these countries, allowing a much more precise and relevant calculation than the set of indicators and calculations used for so-called developing countries - such as the HDI, whose limitations we have indicated.

### 2.1. Better Life Index

The **Better Life** Index, developed by the OECD, extends the measurement of quality of life beyond its economic dimension. It defines objective criteria such as housing, employment, environmental quality, and education, but also more subjective criteria such as the perceived quality of social ties and the balance of life rythms. This index is one of the only ones to consider individual perception.

It measures well-being and progress and seeks to answer the following questions: Are our lives improving? What role can policy play in this? Are we measuring the right things? The Better Life Index is measured in the 37 member countries of the organisation (figure 5).

[15] Australia, Austria, Belgium, Canada, Chile, Colombia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Switzerland, Sweden, Turkey, United Kingdom, United States

It is calculated from 80 indicators of well-being. They reflect the current state of well-being, inequalities and the resources needed for future well-being. The headline indicators used are available in Annex 1.
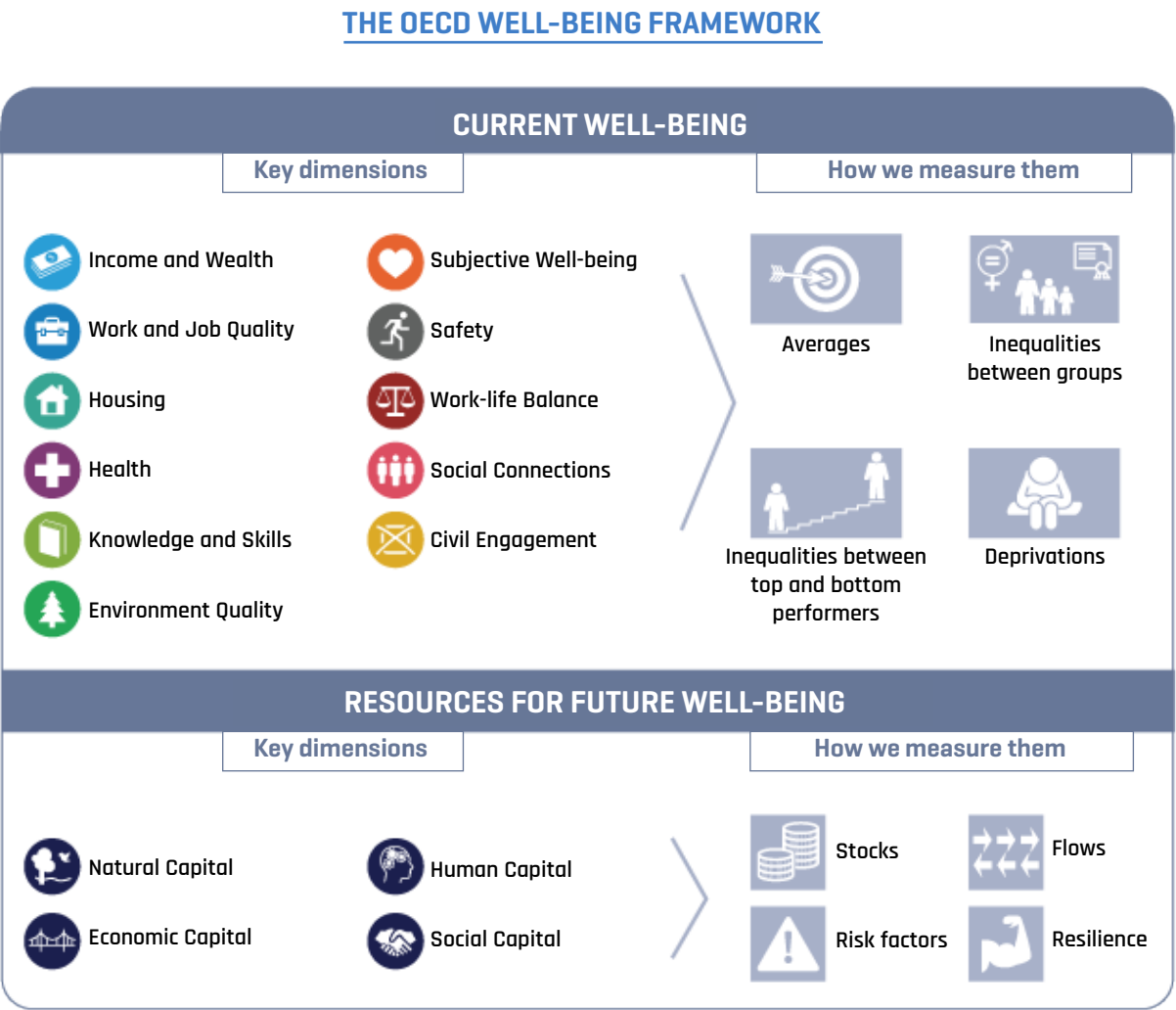
## THE OECD WELL-BEING FRAMEWORK



Figure 5 Better Life Index calculation - OECD, http://www.oecd.org/fr/statistiques/mesurer-bien-etre-et-progres.htm

A statistical report[16] has been published every two years since 2011[17], providing an account of the evolution of well-being in the countries concerned. The latest report shows a strengthening of well-being in the OECD as a whole, but marked inequalities persist between countries. In particular, there are widening gaps in the resources needed for future well-being (economic, natural and social capital). Environmental, economic and social risks also weigh on the future. The report highlights the impoverishment of social relations and a rise in despair and insecurity for certain categories of the population.

[16] OCDE, Rapport Comment va la vie ? 2020 Mesurer le bien-être, 2020, en ligne
https://read.oecd-ilibrary.org/economics/comment-va-la-vie-2020_ab72c502-fr#page16
[17] Les 5 rapports publiés depuis 2011 sont disponibles à l'adresse https://www.oecd-ilibrary.org/economics/how-s-life_9789264121164-en

Country monographs are produced and available online. The latest results for France are presented in the following infographic (Fig. 6).

## FRANCE'S CURRENT WELL-BEING, 2018 OR LATEST AVAILABLE YEAR
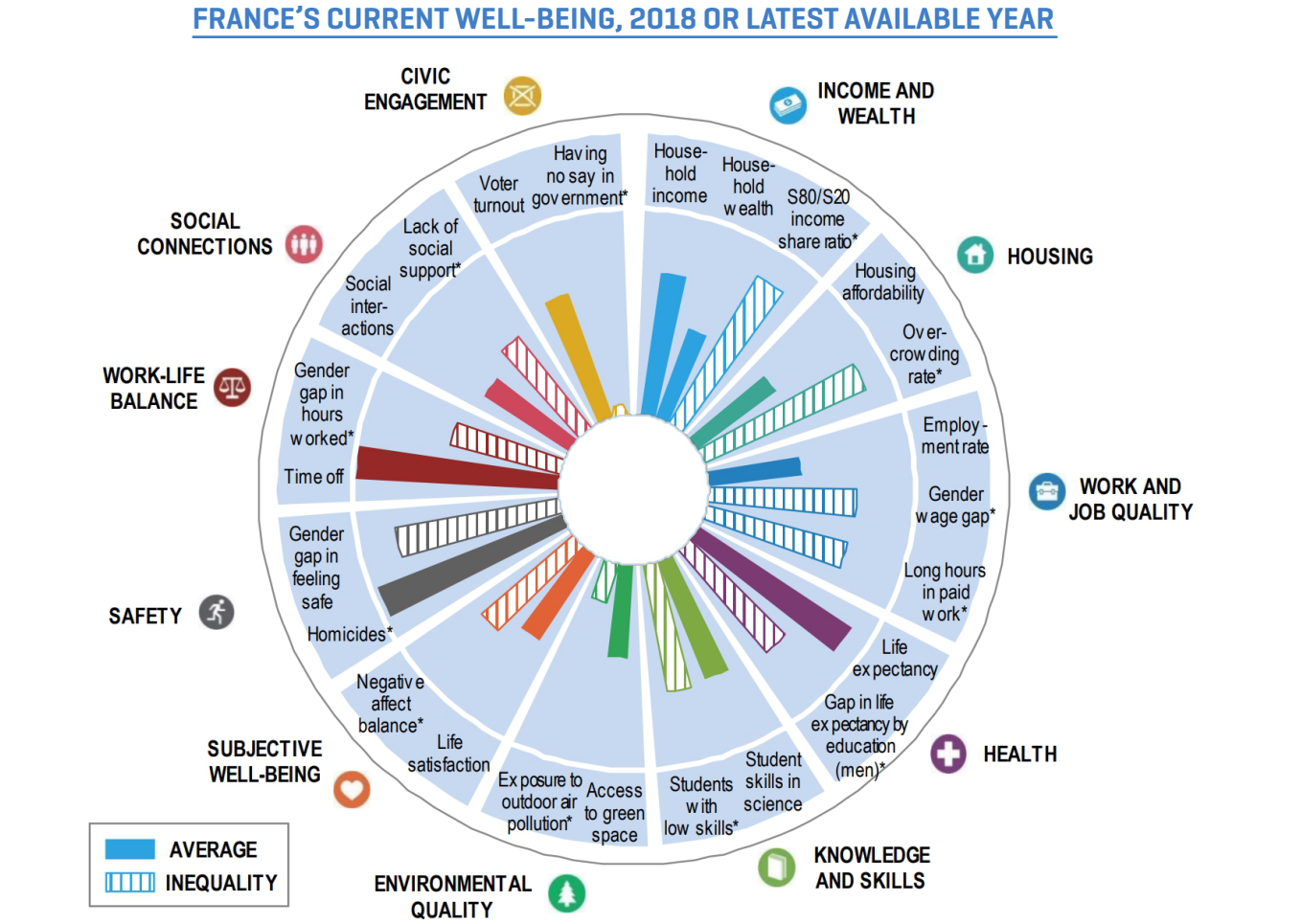


Note: This chart shows France's relative strengths and weaknesses in well-being compared to other OECD countries. Longer bars always indicate better outcomes (i.e. higher wellbeing), whereas shorter bars always indicate worse outcomes (lower well-being) – including for negative indicators, marked with an *, which have been reverse-scored. Inequalities (gaps between top and bottom, differences between groups, people falling under a deprivation threshold) are shaded with stripes, and missing data in white.

Figure 6 State of well-being in France in 2018 - OECD

### 2.2. Statistical atlas of regions and cities

The OECD has developed a variety of other tools to measure the socio-economic and environmental conditions of cities and regions.

The **Statistical Atlas of Regions and Cities**[18] is a new integrated statistical platform from which most of the indicators for the regions and metropolitan areas included in the OECD statistical portal can be viewed and downloaded. For metropolitan areas, several indicators on demography, income, environmental quality, digitalisation, and other aspects are available.

[18] https://regions-cities-atlas.oecd.org/

## 2.3. SDG measurement tool

The OECD has developed a **tool to measure the Sustainable Development Goals in regions and cities**[19]. With more than 100 indicators, this tool measures the status and distance to the Sustainable Development Goals of more than 600 regions and 600 cities in the OECD and partner countries.
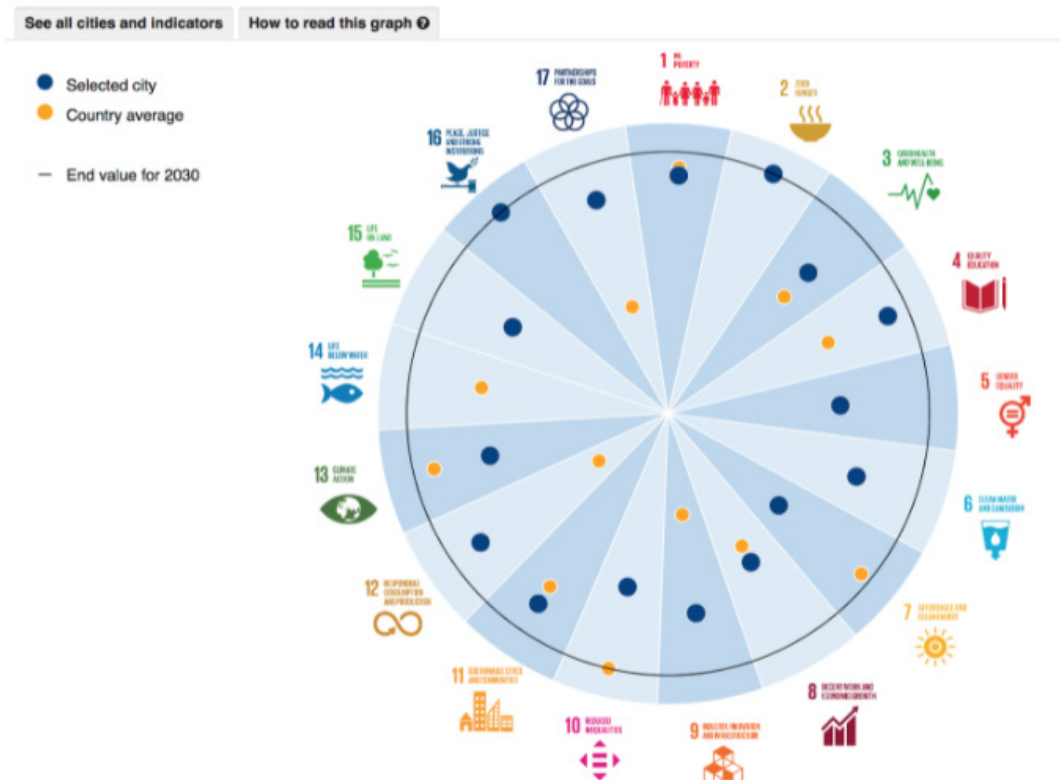
**Example of Paris:**



**Figure 7** Indicators for the city of Paris - OECD

The indicators used are available in Annex 2.

## Regional well-being measurement tool

A **regional well-being tool**[20], measures well-being in 11 dimensions at the regional level and compares it with the 361 other OECD regions. The matrix is reduced to 11 indicators covering as many dimensions of well-being. The tool is aligned with the approach used by the Better Life Index presented above. The main difference is that it does not construct a composite index but keeps the dimensions of well-being separate.

19  https://www.oecd-local-sdgs.org/
20  https://www.oecdregionalwellbeing.org/

## 2.4. World Cities Comparative Report

In 2020, the organisation published **the report *Cities in the World. A New Perspective on Urbanization*** which assesses urbanisation[21] in the world's cities from a comparative perspective. The quality-of-life issue is addressed through the lens of the differences in quality of life between cities and rural areas. These conclusions are based on the work mentioned above, such as the How's life project. The report states that the quality of life and satisfaction is higher in cities.

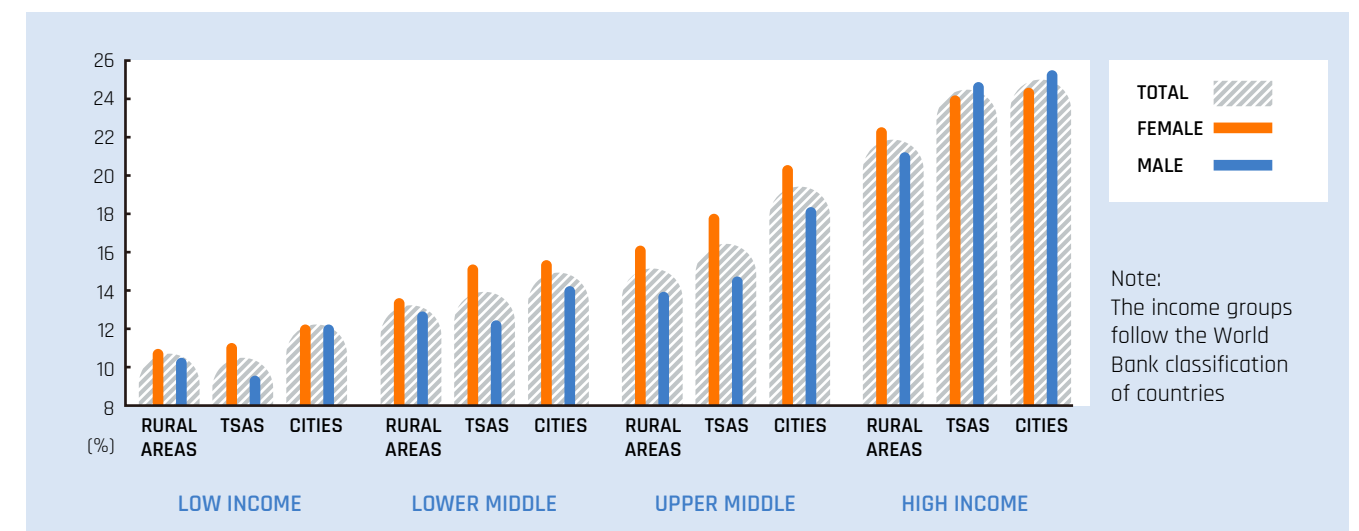**LIFE SATISFACTION BY DEGREE OF URBANISATION, INCOME GROUP AND GENDER**



**Figure 8** Life satisfaction by degree of urbanisation, - OECD, Cities in the World. A New Perspective on Urbanization, p 42

**DIFFERENCES BETWEEN FUTURE AND CURRENT LIFE SATISFACTION**

Expected increase in life satisfaction across income groups and degrees of urbanisation, in percentage points



Note: The figure presents the percentage points difference between current and future life satisfaction by country income class across the degree of urbanisation. The question on expected future life satisfaction asks respondents to state their anticipated life satisfaction in five years.
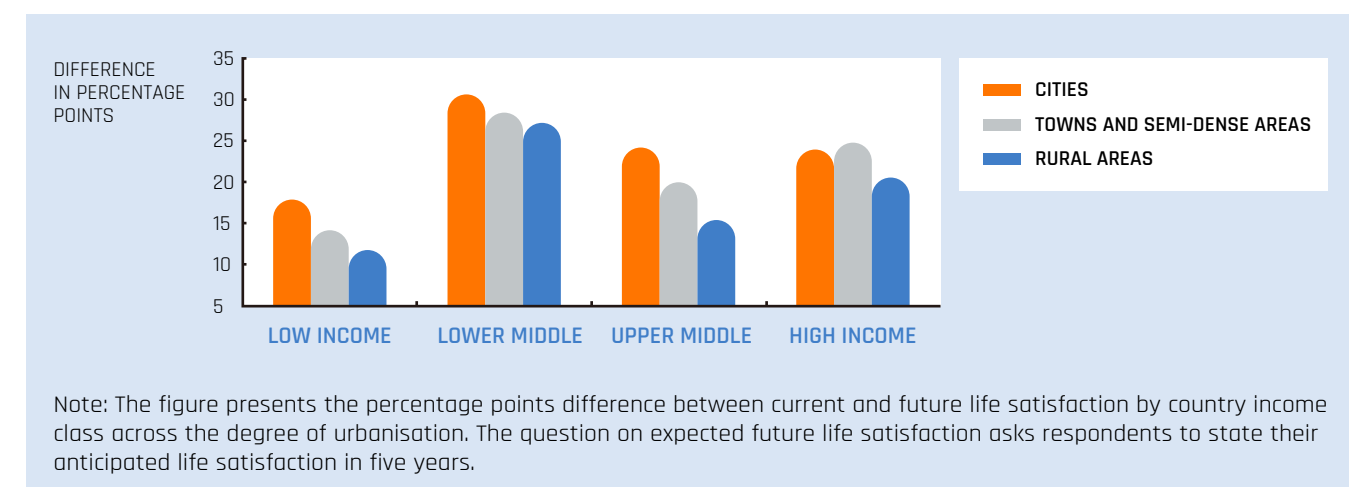
**Figure 9** The difference between current and future situations - OECD, Cities in the World Report. A New Perspective on Urbanization, p 43

21  https://www.oecd.org/publications/cities-in-the-world-doefcbda-en.htm

## 2.5. Methodology for measuring Smart Cities

With regard to the Smart City or intelligent city more specifically, the OECD is currently working on a **methodology to measure their performance in** order to integrate them into a more inclusive growth. This measurement is based on three pillars (fig. 10):

1. Indicators on the degree of digitalisation and digital innovation implemented in the city; *Smart City* tools
2. Indicators on the engagement of a variety of stakeholders in the development of the *Smart City*
3. Indicators related to the four major objectives of the *Smart City*: well-being, inclusion, sustainability and resilience

### THE FOUR GOALS OF THE SMART CITY CROSSED WITH ITS OBJECTIVES
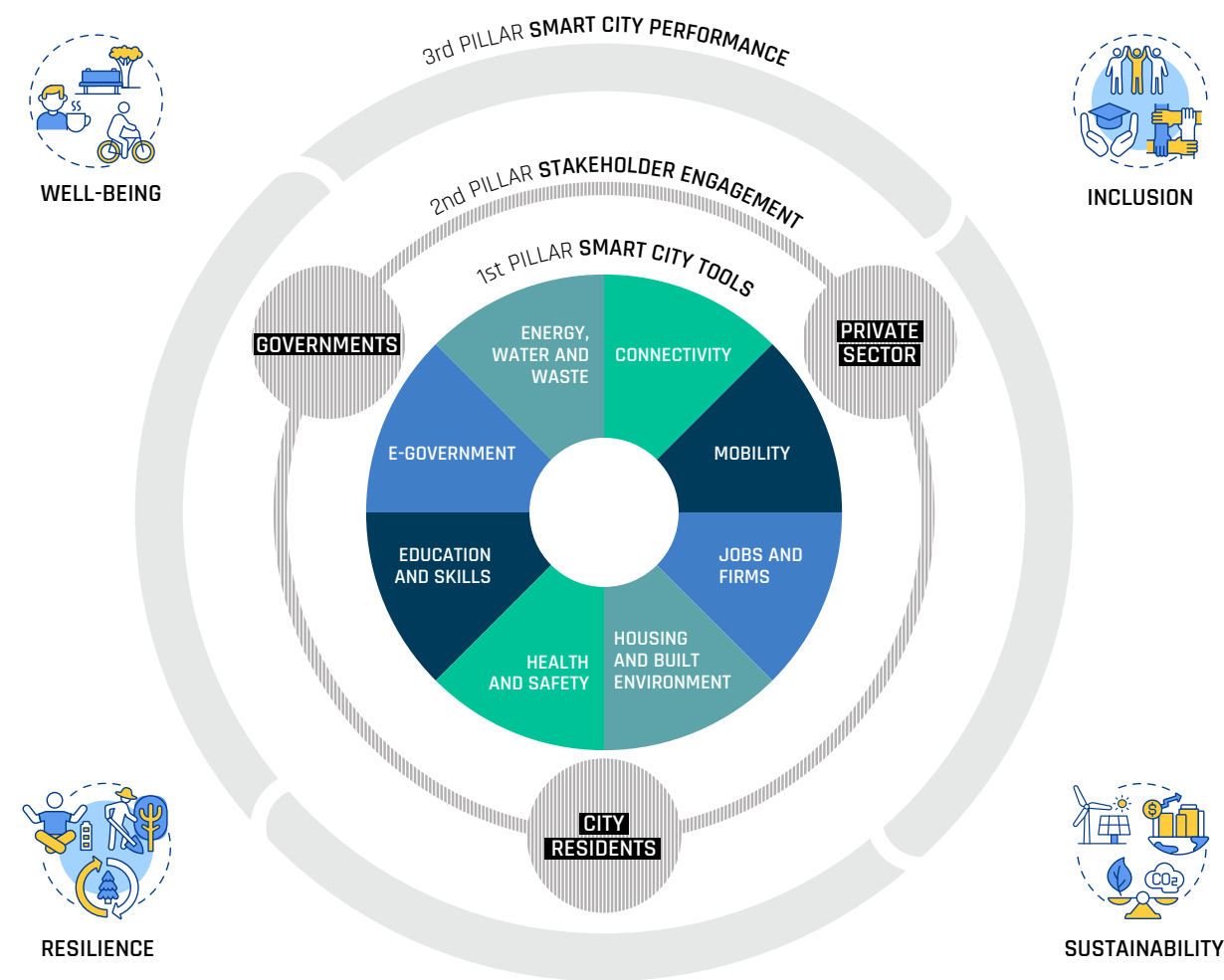


**FIGURE 10** THE FOUR GOALS OF THE SMART CITY CROSSED WITH ITS OBJECTIVES - OECD

The indicators envisaged for each of the pillars of the measurement tool are shown in Annex 4.

## 2.6. Urban Barometer of Inequalities in well-being

A final OECD project concerns the development of **an urban barometer that would measure inequalities in well-being in cities**. It measures well-being through a subjective approach that complements the objective picture drawn elsewhere. Its main features are as follows:

- Focus on well-being and inclusive growth
- Innovative tool to collect well-being data directly from citizens (digital survey tool with declarative data localisation)
- Cross-referencing of the answers to the digital questionnaire with data already collected by the participating cities and with other sources from the big data on well-being.
- Complementary to official sources of objective data
- A participatory and justifiable approach

The Urban Barometer online questionnaire collects the following data (Fig. 11).

### RÉPONSES PRINCIPALES DE L'URBAN BAROMETER



| | |
|---|---|
| Life satisfaction<br>Eudaimonia<br>Positive and negative affects<br>Etc. | Satisfaction with housing<br>Feeling of safety<br>Social connections<br>Trust in others<br>Etc. |
| **SUBJECTIVE WELL-BEING** | **SELF-REPORTED DATA ON OTHER DIMENSIONS OF THE OECD WELL-BEING FRAMEWORK** |
| **SATISFACTION WITH RECENT EXPERIENCES OF GOVERNMENT SERVICES** | **DEMOGRAPHIC CHARACTERISTICS** |
| Education and health care<br>Public transport<br>Public spaces<br>Access to culture and leisure activities<br>Etc. | Age and gender<br>Education level<br>Employment status<br>Place of work/school<br>Income level<br>Etc. |

**Figure 11** Main responses - Urban Barometer

# 3.
# EUROPEAN
# UNION INDICATORS

In the European Union, the measurement of urban quality of life was initiated as early as 1998, with an urban audit project *Assessing the Quality of Life of Europe's Cities*. The aim of this pilot initiative was to assess the situation in each of the cities in the programme and to develop a reliable and comparable database for evaluating the participating cities (Fig. 12). This project was the first effort to systematically collect and process statistical information on a European scale and gave impetus to thinking about the concept of quality of life and the appropriate indicators to assess it.
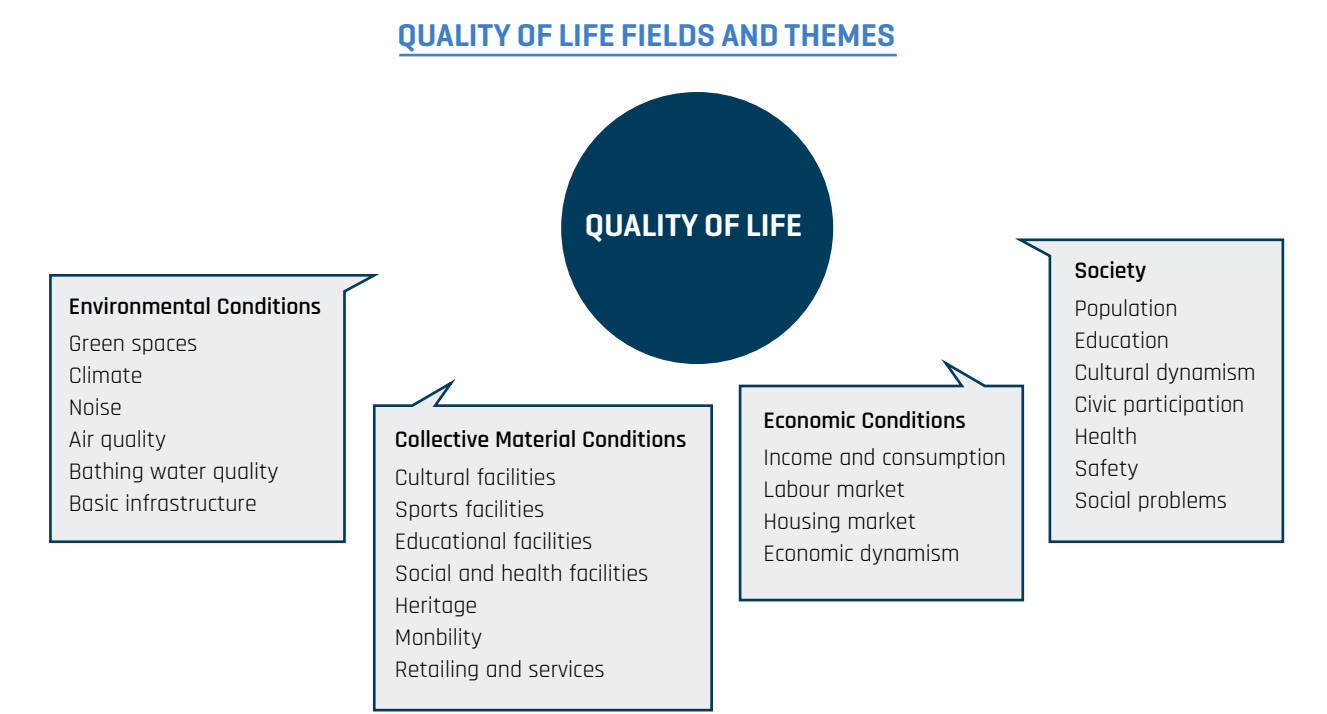
## QUALITY OF LIFE FIELDS AND THEMES

**QUALITY OF LIFE**

**Environmental Conditions**
Green spaces
Climate
Noise
Air quality
Bathing water quality
Basic infrastructure

**Collective Material Conditions**
Cultural facilities
Sports facilities
Educational facilities
Social and health facilities
Heritage
Monbility
Retailing and services

**Economic Conditions**
Income and consumption
Labour market
Housing market
Economic dynamism

**Society**
Population
Education
Cultural dynamism
Civic participation
Health
Safety
Social problems

**Figure 12** Quality of life fields and themes - Assessing the Quality of Life of Europe's Cities, 1998.

The **statistical office of the European Union (Eurostat)** has developed an extensive database of urban statistics that provides data sets on key aspects of the quality of life in cities. They include data on cities and their commuting areas or "functional urban areas" and cover demography, housing, health, labour, education, environment, transport, tourism, etc. The data is provided on a voluntary basis, without any legislative obligation, in conjunction with the National Statistical Institutes, the Directorate General for Regional and Urban Policy and Eurostat. Urban statistics aim to assist both citizens and policy makers and to further support evidence-based decision making (Fig. 13).

## CITIES AND SUBURBS STATISTICS

**Figure 13** Cities and suburbs statistics - Eurostat, 2015

The database is available online on the Eurostat website[22] and a European statistical yearbook is published annually. Its multi-scalar approach provides a comparative reading and understanding of the different European regions.

Eurostat has also conducted perception surveys on the quality of life in European cities since 2007[23]. In 2015, except in 6 cities, 80% of respondents were satisfied with living in their city. The highest satisfaction rates were in Oslo, Zurich, Aalborg, Vilnius, and Belfast.

[22] https://ec.europa.eu/eurostat/fr/web/cities/data/database
[23] https://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/urban/survey2015_en.pdf

# 4.
# CITY RANKINGS

City rankings are a widely used and popular way of measuring the quality of urban life. These rankings are mostly produced by private actors or associations and are often taken up by the media. They are carried out in a comparative context, for example, to help citizens in their property purchases. These rankings are hardly relevant to a forward-looking approach to urban development and can fuel competition between different cities. More than the use made of them, our interest lies in the criteria that these rankings use to evaluate the quality of life of territories.

## 4.1. The first rankings in the 1970s

In the 1970s, the measurement of quality of life, and more particularly spatialized quality of life, became a subject of study in its own right, as shown by the studies of H. SCHWANDT and W. BLOOMER in Urban Affairs Annual Review (1969), that of Smith in The Geography of Social Well-being in the United States: An Introduction to Territorial Social Indicators (1973) and that of Liu on Quality of life indicators in the United States. BLOOMER in *Urban Affairs Annual Review* (1969), Smith's study in *The Geography of Social Well Being in the United States: An Introduction to Territorial Social Indicators* (1973) and Liu's study on *Quality-of-life indicators in U.S. metropolitan areas: a statistical analysis* (1976).

The measure of quality of life is based on socio-economic dimensions and neighbourhood characteristics (housing, services, local facilities, places of consumption, democratic life, social life). Based on income and physical indicators of the living space, Liu arrives at a ranking of 240 metropolitan areas according to five general categories of well-being: **economic status, political performance, environmental conditions, education and health, and social issues.** According to their results, metropolitan areas are classified into three normative categories: poor, adequate, good, excellent, and outstanding. The arbitrariness of the method, the choice of indicators and variables has been criticised.

The following table shows the different indicators taken into account in the major academic research of the 20th century (fig. 14)

## TABLE OF QUALITY-OF-LIFE MEASUREMENT INDICATORS
selon différents chercheurs entre 1973 et 1990

| Research Dimension | Smith 1973 | Liu 1976 | Boyer and Savageau 1981 | Rogerson et al. 1988 | Burnley 1988 | Hart et al. 1989 | PCC 1990 |
|---|---|---|---|---|---|---|---|
| Environment/Pollution | - | X | X | X | X | - | X |
| Atmosphere/Peace and Quiet | - | - | - | - | X | X | X |
| Climate | - | - | X | X | X | - | - |
| Lifestyle opportunities | - | - | - | - | X | - | - |
| Employment | - | - | - | X | X | - | - |
| Retirement | - | - | - | - | X | - | - |
| Housing Costs and Access | X | X | X | X | - | X | X |
| Health Care/Public Health | X | X | X | X | - | X | X |
| Crime/Public Safety | X | - | X | X | - | - | X |
| Transport/Traffic flow | - | - | - | X | - | X | X |
| Education Provision/Levels | X | - | X | X | - | X | X |
| Recreation | - | - | X | X | - | - | - |
| Economy/Business climate | X | X | - | - | - | X | - |
| Arts/Cultural diversity | X | - | X | X | - | X | - |
| State taxes/Development Aid | - | - | - | - | - | X | - |
| Commercial space | - | - | - | - | - | X | - |
| Proximity to suppliers/market | - | - | - | - | - | X | - |
| Food costs/Cost of living | - | - | X | X | - | - | - |
| Political Involvement | X | X | - | - | - | - | - |
| Wages | - | - | - | X | - | X | - |

**Figure 14** Table of quality-of-life measurement indicators by different researchers between 1973 and 1990 - Compilation

## 4.2. The Places Rated Almanac and the Mercer ranking

In pursuit of this comparative goal, the indicator analysis method has been widely used by the media for various city rankings. From 1981 to 2000, **the American Places Rated Almanac** was a great success and popularised the statistical ranking. These rankings have multiplied and are still popular today. On an international scale, we can mention the **annual** Mercer **ranking**, based on 39 criteria.

## 4.3. Quality of life in Boyd Cohen's Smart City Wheel

The *Smart City* concept has also been used to compare and benchmark cities. Understood as a high-performance and innovative city, the *Smart City* is understood through the intelligence or performance of its economy, mobility, relationship with the environment, governance, quality of life and implementation of citizenship.

Boyd COHEN, an urban and climate expert, proposed a graphic model in 2012 that reflects the six key dimensions of the *Smart City* (fig. 15). The wheel provides a holistic approach to the *Smart City* and shows how innovation and technology can lead to the development and efficiency of a city. In particular, it has been used to rank smart cities in the world and within different regions of the world[24]. Its use is thus mainly competitive and comparative (Fig. 16).



**Figure 15** The Smart City conceptual wheel - Boyd COHEN



**Figure 16** Ranking of Smart Cities in the world

However, this wheel has been adapted by some countries in a constructive development approach to meet their needs. Switzerland, for example, has created its own *Smart City Wheel* associated with a *Smart City* architecture (fig. 17)[25].
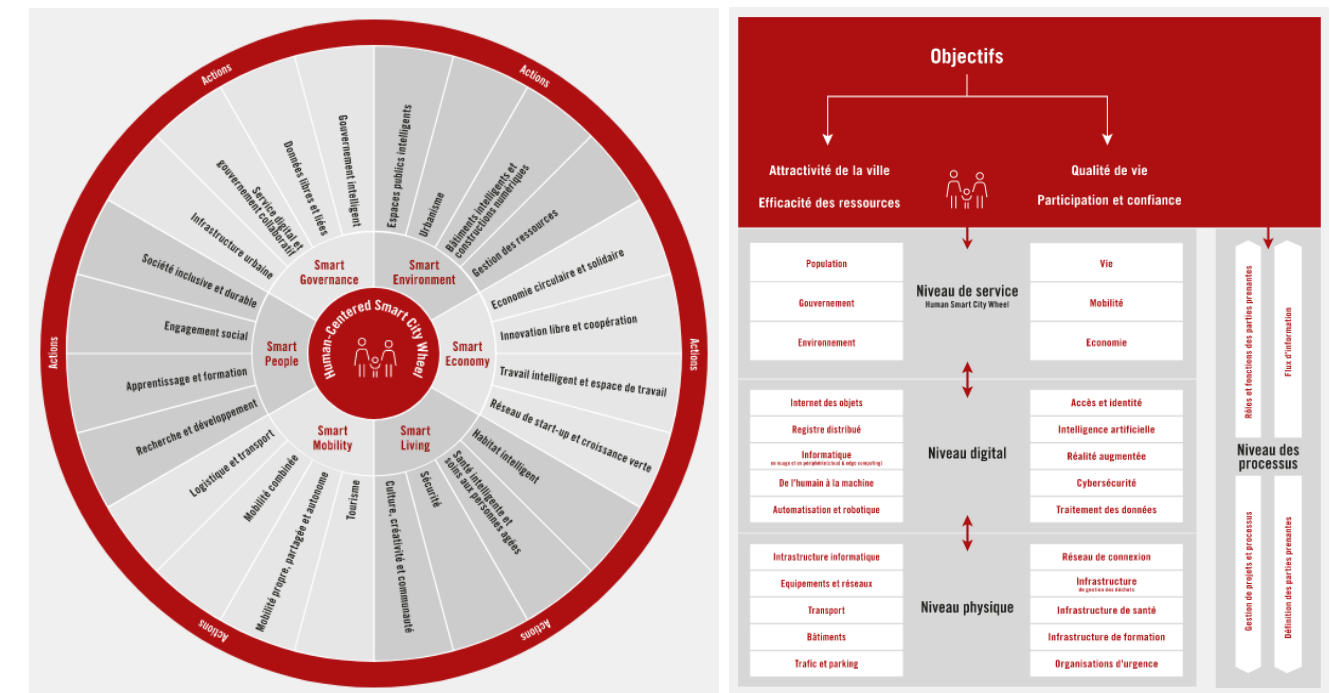


**Figure 17** The Swiss Smart City Wheel - Boyd COHEN

**4.4. The Happy Citizen Hexagon by Rob Adams and Boyd Cohen**

Based on the wheel model, Rob Adams and Boyd Cohen have added an indispensable dimension of well-being and happiness. This improvement is the result of a series of interviews and a simple observation: what the inhabitants, elected officials and users of a city want is to **be well**. "Nature", clean air and social connections are more in demand than technological tools. The development of a new tool, the *HappyCitizenHexagon*, reflects the transition from a technological *Smart City* to a human *Smart City*, which introduces six main axes (fig. 18):

---

24 These rankings can be found on the Fast company website https://www.fastcompany.com/user/boyd-cohen

25 https://www.smartcityhub.ch/une_roue_smart_city_pour_la_suisse.120fr.html
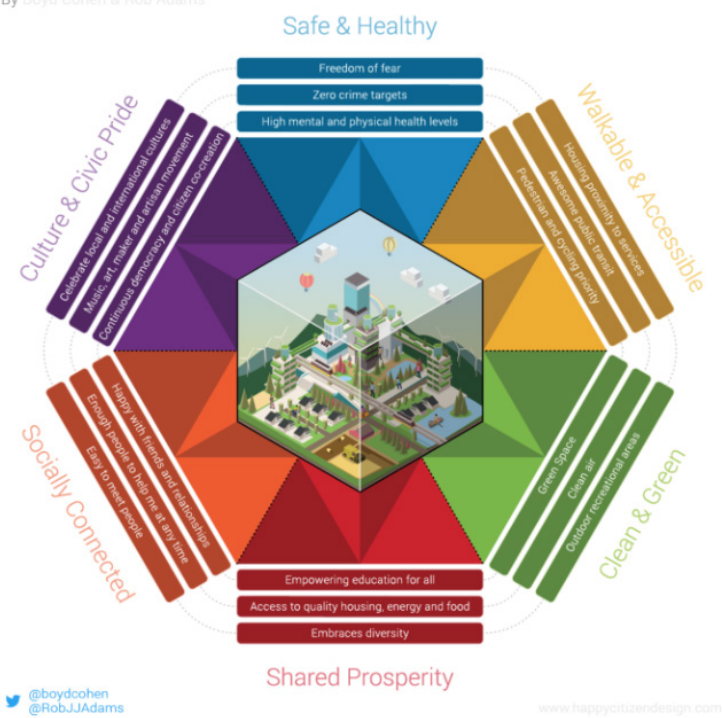
**Figure 18** The human Smart City: concepts and issues - Boyd COHEN & Rob ADAMS

## 4.5. Major international rankings

There are now various international city rankings, by theme and by region. One of the best known, created in 2010, is the **Lee Kuan Yew World City Prize**, which recognises cities that have made outstanding contributions to creating liveable, vibrant and sustainable urban communities around the world. It also aims to facilitate an exchange of easily replicable ideas and best practices to stimulate innovation in sustainable urban development.

The cities are assessed on the basis of the following criteria (Table 1):

### Criteria for inclusion in international rankings

| N° | Criterion | Detail |
|---|---|---|
| 1 | *Leadership and governance* | Demonstrate strong leadership and governance, through vision, commitment and contingency planning, to achieve urban transformation objectives |
| 2 | *Creativity and innovation* | Demonstrate creativity and innovation in the overall blueprint or core strategy and in the implementation approach adopted, in order to establish new models and benchmarks |
| 3 | *Replicability* | Good practices and replicable ideas that can be adopted and adapted by other cities |
| 4 | *Impact of urban initiatives implemented* | Positive changes in the urban environment, local communities, and the general population as a result of urban initiatives |
| 5 | *Sustainability of the transformation* | Establishment of institutionalised processes to support urban transformation and buy-in from local communities in support of the city's vision |
| 6 | *Integration with plans* | Demonstration of successful integration or scaling at regional and metropolitan level |

**Table 1** Criteria for inclusion in international rankings - Lee Kuan Yew World City Prize

The winner receives an award certificate, a medal, and a prize of S $300,000, sponsored by the Keppel Corporation. The winning cities are Bilbao (2010), New York City (2012), Suzhou (2014), Medellin (2016), Seoul (2018), 2020, 2022.

Internationally recognised awards include the **World Smart City Awards**, which are presented annually at the annual *Smart City* Congress in Barcelona. This competition aims to reward pioneering projects, ideas and strategies that make cities more liveable, sustainable, and economically viable. The categories of awarded projects are adapted to the current situation and its challenges.

Thus, in 2020, the categories and winners were as follows (tab. 2):

### The winners of the World Smart City Awards in 2020

| Award category | Smart city | Mobility | Enabling Technologies | Urban Environment | Living and Inclusion |
|---|---|---|---|---|---|
| Winner | Shanghai Municipal Government, China | Pantonium, Toronto Canada | Shenzhen Government Services Data Bureau, China | Microsoft and Siemens, Munich, Germany | Government of the State of Alagoas, Brazil |
| Project | Smart Shanghai People-Oriented Smart City | Software solution capable of converting the entire public transit fleet of a city from fixed route operations to a flexible on-demand service | Digital City - Technology Makes a Better City | Mindsphere City Graph: digital twins of real entities in a city and optimized city operations step-by-step | A New Life in the Grotas: evidence-based slum improvement and urban development |

**Table 2** The winners of the World Smart City Awards in 2020 - Fira de Barcelona

## 4.6. Ranking of French towns and villages

In France, the **"Association des villes et villages où il fait bon vivre" (Association of towns and villages where it is good to live)** carries out an annual ranking based on 182 criteria, using official data provided by INSEE and state bodies. In total, 151 criteria concern the municipalities directly, 31 concern the departments and the safety category. The eight categories studied (quality of life, transport, shops, services, health, education, sport, solidarity) are weighted according to their importance following the results of a survey carried out on a sample of the population (tab. 3).

### Main criteria - "Association des villes et villages où il fait bon vivre" in France

| Category | Quality of life | Security | Transport | Shops and services | Health | Education | Sports and leisure | Solidarity |
|---|---|---|---|---|---|---|---|---|
| Weighting [%] | 82 | 70 | 53 | 48 | 43 | 34 | 28 | 28 |

**Table 3** Main criteria – "Association des villes et villages où il fait bon vivre" in France

All the criteria, broken down by category and sub-category, are available in Annex 5.

# 5.
# MEASURING FRENCH METROPOLITAN DYNAMICS

## 5.1. National methodologies for comparative purposes

The Fédération Nationale des Agences d'Urbanisme (FNAU), in partnership with France Urbaine, the Association des Communalités de France (AdCF) and the Agence Nationale de la Cohésion des Territoires (ANCT) have developed **Métroscope**, a tool that allows the dynamics of the 22 French metropolises to be deciphered.

Métroscope analyses **four metropolitan functions: taxation, higher education and research, employment and housing**. Its contribution is also the **study of the quality of life of territories**.

The methodology is based on a reference framework of nearly 60 indicators and is shared between the intermunicipal authorities and the agencies. The approach is thus collaborative and makes it possible to inform local and national public action.

The indicators are organised around four metropolitan functions:

- **Contribute** this function analyses investment and fiscal integration as well as wage flows, at the level of the metropolitan territory and between territories.
- **Study and innovate** this function analyses higher education as a marker of the metropolis and its attractiveness and questions the capacity for innovation.
- **Work** this function specifies the quantity and quality of metropolitan jobs and their influence on the societal structure.
- **Living** this function analyses the housing stock and housing dynamics.

Quality of life is then understood in the form of a typology, a methodology that makes it possible to integrate many indicators into a single analysis. This makes it possible to reflect the plural and cross-cutting nature of quality of life and to avoid the pitfall of ranking.

Métroscope is inspired by the IBEST ("Indice de Bien Être Soutenable et Territorial") methodology, which measures well-being using quantitative and qualitative surveys. This methodology allows the subjective dimension of well-being to be taken into account. The indicators used for each metropolis are available in Appendix 6.

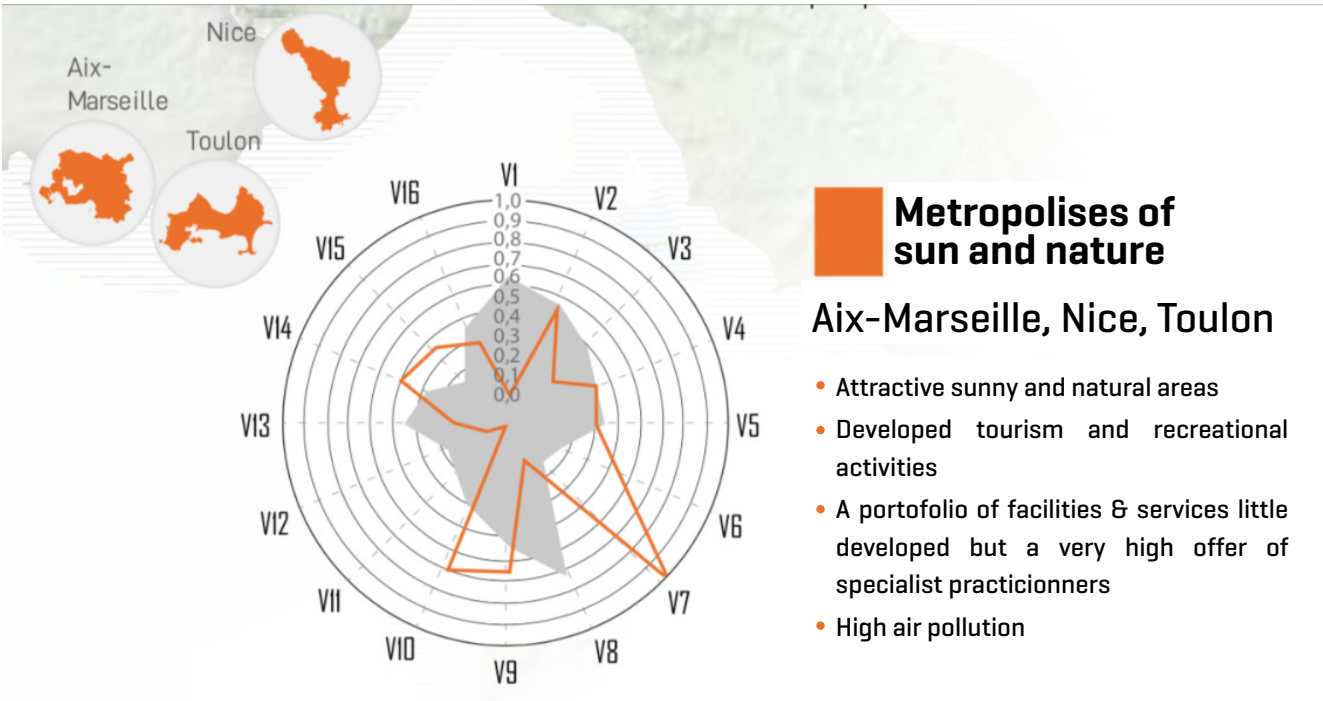This analysis provides comparative results between metropolises (fig. 19).



**Metropolises of sun and nature**

## Aix-Marseille, Nice, Toulon

- Attractive sunny and natural areas
- Developed tourism and recreational activities
- A portofolio of facilities & services little developed but a very high offer of specialist practicionners
- High air pollution

**Figure 19** Extract from the metropolis profiles - Metroscope 2020

## 5.2. More territorial methodologies and projects

In order to take into account the particularities of each metropolis, Métroscope presents focuses on the local components of well-being, based on examples of territorialized methodologies (tab. 4).

### Local components of French metropolises - Metroscope

| Metropolis | Mesure | Innovation | Method |
|---|---|---|---|
| Grenoble | Territorialized and sustainable well-being: fundamental variables and aspiration. | Link to the natural environment, democracy and living together, relationship to time and rhythms of life, self-assertion and commitment | Indicators, IBEST |
| Brest | Social representations of nature in the city | | Study of the social representations of nature in the city, qualitative and quantitative approaches |
| Paris | Participatory democracy and sensitive analysis of the territory | Tools for citizen participation: participatory budget | |
| Strasbourg | Living environment | Climate analysis | Measurement of night-time surface temperatures by remote sensing |
| Dijon | Living environment | Air quality and urban temperatures | Concentration of particles in the air by Atmo and KameleO index, Urban temperatures and climatic analysis by Réseau Mustard Dijon |

| Metropolis | Mesure | Innovation | Method |
|---|---|---|---|
| Rouen | | Redevelopment of riverbanks in city centres, improving the relationship with river spaces | |
| Nancy | | Circular economy projects | Local waste prevention programme and PLUiHD, associations (Repair Cafés), Maison du Vélo, |
| Saint-Etienne | Impact of urban planning on health | Specific study protocol for the analysis of the impacts of planning and development choices on the well-being and health of populations. | Analysis of the health status of inhabitants, spatialization of health determinants<br><br>7 of these are taken from local sources:<br>• co-exposure to noise<br>• co-exposure to air pollution<br>• exposure to urban heat islands,<br>• pedestrian access to services, shops and facilities,<br>• pedestrian accessibility to public transport stops,<br>• pedestrian access to recreational areas, the level of degradation of the habitat. |
| Nancy | Generational approach to urban planning | Expertise in "ageing well" neighbourhoods to target public action | Identification of neighbourhoods and mapping of essential services accessible to senior pedestrians.<br><br>Verification through a sensitive user expertise approach<br><br>Public transport operator database, Sirene database and CCI commercial rent observatory |
| Marseille | Nightlife | Creation of facilities adapted to nightlife: signposted night-time routes, anti-noise screens and buildings, night-time mobility | |
| Clermont Ferrand | | Cultural projects for a better quality of life | |
| Toulouse | New metro line for urban renewal | Partnership and research approach | Urban Pact: a comprehensive and collaborative approach to the coherence of urban development and existing or planned transport infrastructure |
| Lille | | Prevention of delinquency | Metropolitan security and crime prevention plan |
| Rennes | Temporal analysis of the lived territory Temporality as an indicator of quality of life and attractiveness | Mapping of access times on foot to shops and services in the area. | Time Office Methodology available in the article "Cartes et géomatique", n°225, published by the French Committee of Cartography, www.lecfc.fr |

**Table 4** Local components of French metropolises - Metroscope

# 6.
# INDICATORS CREATED BY TERRITORIAL ECOSYSTEMS

Quality of life can be assessed at different scales and through several approaches. Non-institutional actors, anchored in a territory or in an urban theme, take up the challenge of improving quality of life and develop their own indicators. These indicators, which can lead to labels, classifications and actions, enrich the understanding of urban systems.

## 6.1. The Cittaslow network and indicators



**Figure 20** Logo - Citta Slow

The Cittaslow[26] approach places quality of life at the heart of urban organisation and makes it a real tool for urban transformation. More specifically, the Cittaslow initiative measures "**equitable and sustainable well-being**" (BES). The cities involved in this initiative implement a policy of a desired slowing down of the territory in order to promote quality of life. A certification label is awarded to them for five years after an evaluation of the criteria on their urban environment and lifestyle. At the end of 2020, the network had 268 member cities, most of which are located in Europe. The admission evaluation is based on the criteria grid available in Annex 7.

## 6.2. The Livability Index

An online **Livability Index** has been developed by the AARP Institute for Public Policy in the United States. It measures the quality of life in American city neighbourhoods, based on data on housing, neighbourhood, transport, environment, health, engagement, and equal opportunities. The values obtained in each category are combined into a category score. These scores are then averaged to create a liveability score between 0 and 100 (Fig. 21).

A total of 40 measures relate to the standard of living of communities. 23 measure liveability at the neighbourhood level, while the remainder relate to larger scales (city, metropolitan area, county). A further 20 measures relate to the policies and strategies put in place by the community. These items measure the potential to improve quality of life over the long term.

The table in Annex 7 shows all the categories above, measures and sub-measures, policies and indicators used by the AARP index.

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26  https://www.cittaslow.org

To achieve a high score, a good score in all categories is necessary.

Scores are constructed at the neighbourhood level. Cities, counties, and states receive a score based on the average scores of the neighbourhoods within their boundaries.

The index is intended as a tool for improving quality of life, with a view to achieving a higher score, monitoring progress over time, but also as a practical tool for the inhabitants or future inhabitants of a place.



**Figure 21** Example of a Liveability Index score - https://livabilityindex.aarp.org/how-are-livability-scores-determined

## 6.3. State of Place, an example of a private initiative to measure quality of life through walkability

The rise of Big Data and Open Data has also enabled the development of computerised urban quality of life measurement systems, developed and marketed by private companies. For example, an urban data analysis platform has been developed on the basis of the *Irvine Minnesota Inventory* (IMI) audit tool[27] by **the start-up *State of Place***. It quantifies the walkability of a city and the quality of existing urban spaces. It also enables the projection of scenarios for improving an area, particularly in terms of its pedestrian accessibility.

Example of an urban space evaluation by the platform, followed by an improvement scenario (fig. 22).



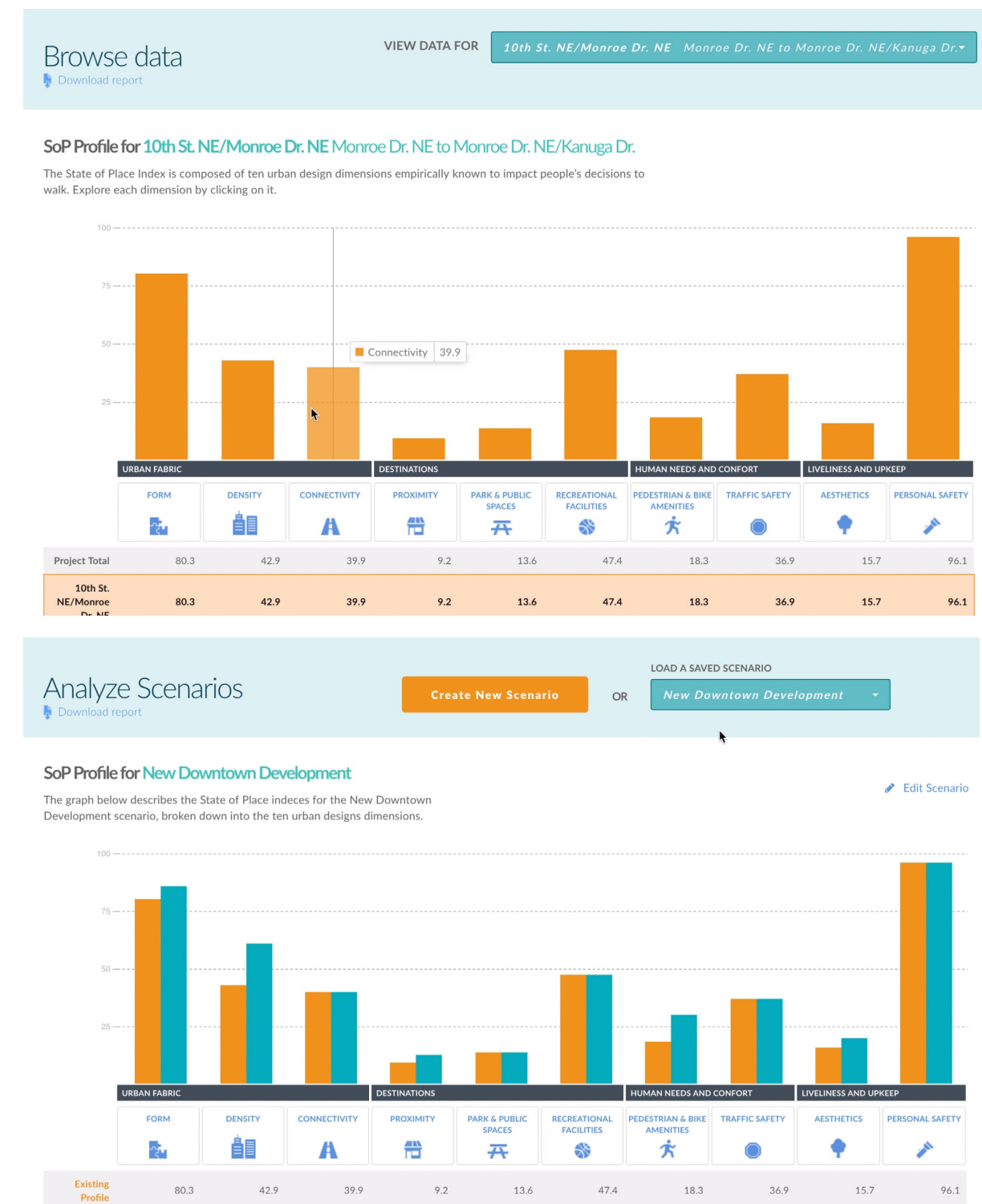**Figure 22** Screenshots of State of Place - https://www.stateofplace.co and State of Place Demo video

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[27] The IMI was set up in 2003-2005 to objectively measure urban elements that have an impact on physical activity.

# II/ BEYOND FIGURES, A QUALITATIVE AND SENSITIVE ANALYSIS OF TERRITORIES

## 1.
## COMPLEMENTARITY AND THE NEED FOR A SUBJECTIVE AND QUALITATIVE APPROACH TO QUALITY OF LIFE

Assessing the quality of urban life is a complex process. Although statistical and quantitative analysis initiatives are enlightening, they are not sufficient to gain a detailed understanding of the territories.
"What is really the user experience in the territory? Where are the socializing places? Which services are missing at neighbourhood scale?"
In addition to the quantitative approach, a qualitative approach is essential to understand an area or neighbourhood in a sensitive way. This evaluation of well-being in the urban space can be based on the feelings of the inhabitants and their experience of daily life in this environment. This subjective and qualitative analysis is becoming increasingly important in the understanding of territories and in the design of urban projects, recognising some form of control of use to users and inhabitants.

The qualitative apprehension of a territory can be done through various methods:

- Consultation and online/paper questionnaire
- Participatory mapping
- Participatory meetings and workshops
- Grouped and participatory strolling
- Workshops in schools
- …. etc

## 2.
## THE CARTOGRAPHIC TOOL AS A REPRESENTATION OF THE LIVED TERRITORY

The territorial map is a highly standardised tool, respecting conventions that determine its use, with the aim of functional, rational, and rapid communication. It plays a major role in the way we experience a territory, understand it and develop it. Indeed, it is from maps that we look at the territory, that we think about its legal and administrative organisation. This so-called top-down vision[28] of the territory remains a cartographic representation tool that does not reflect the use and the feeling of the territory. Since the 2000s and the popularisation of Google Maps, created in 2005, online cartography and geolocation have become tools appropriated by users that allow them to explore territories differently.

The potential of the cartographic object goes beyond rational and utilitarian representation. Within the framework of a qualitative analysis of a territory, the cartographic tool can be used to identify, create and illustrate a sensitive approach to the urban space.

> "The sensitive and artistic map proposes to change its function in relation to the territory. It abandons the objectivist ambition characteristic of modern scientific activity, and no longer seeks to represent the world in the most accurate way so that we can find our way around it. It is not a question of moving from "the objective to the subjective" but rather of changing the objective, the ambition, the aim.[29]

Sensitive maps are different in that they do not seek to show the objective and tangible characteristics of a place but rather the experience of those who use it. Produced with the inhabitants and users, they are a medium for transcribing the use of space and places by those who know and experience them. For those involved in spatial planning, these maps are also valuable tools for better understanding the issues at stake in project sites, the particularities of the spaces and responding to the needs of users. "Sensitive mapping" (Olmedo, 2019)[30] reflect a way of life and are therefore specific to each individual and each territory. They necessarily constitute a partial and situated representation of the territories, which can distort the geographical reality to translate it into a particular opinion or even let the markers of an era of the territory show through.

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[28] Expression used by urban and regional planners to evoke a conception of the territory from above, i.e. by institutions and policies.
[29] http://polau.org/pacs/test-page/
[30] Élise OLMEDO, "Carte sensible, parcours de vie. Katia, La Cabucelle neighbourhood", Vacarme, vol. 89, no. 4, 2019, pp. 108-114.

POLAU identifies different types of sensitive maps[31] :

Subversive maps, which aim to counteract a territorial representation for political reasons (fig. 23)

Typographic maps, which use typographic elements to create unusual representations of the territory (fig. 24)
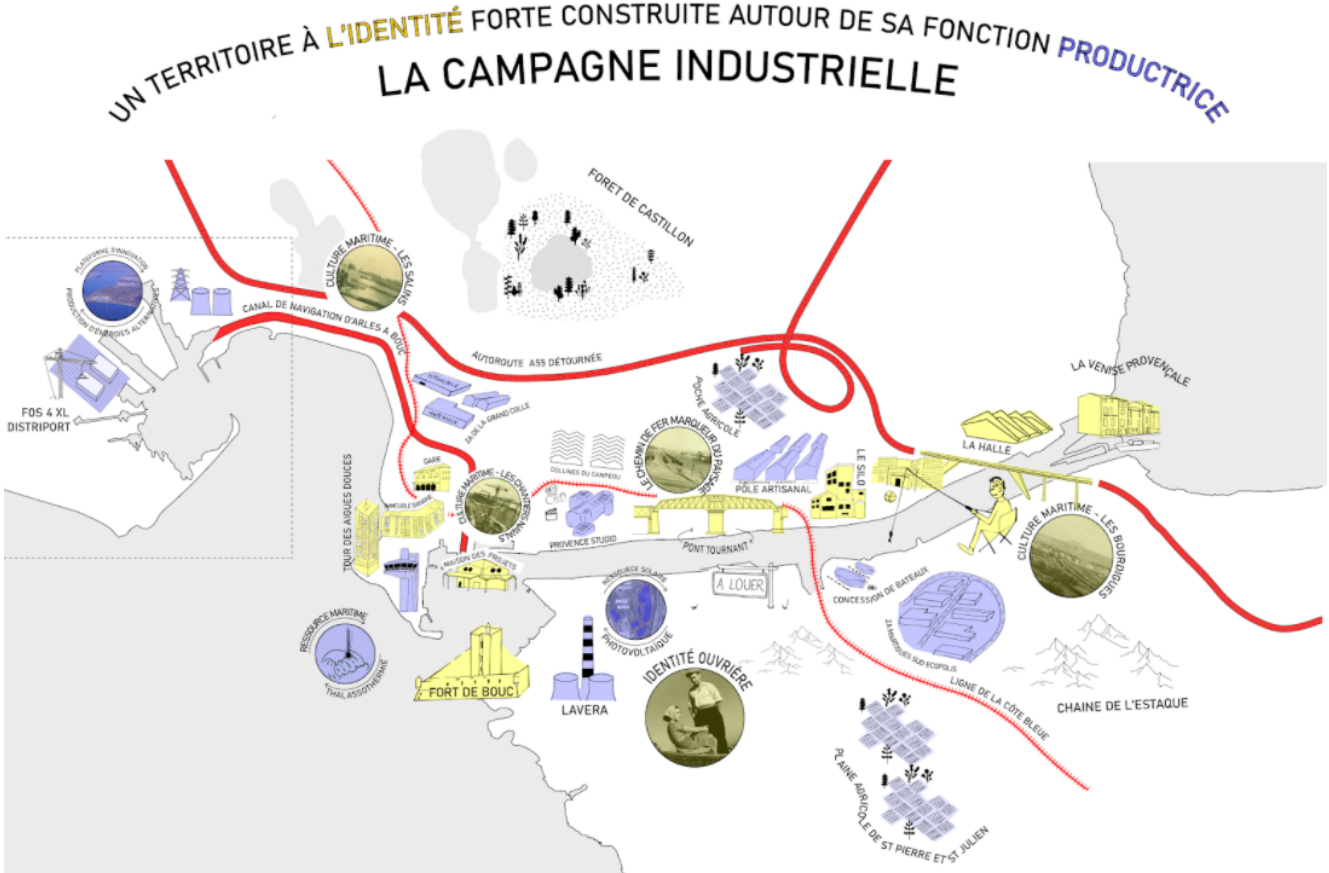


**Figure 23** The archipelago state of Palestine - Obgeographic, blog by Julien BOUSAC



**Figure 24** A representation of Australia - https://www.123rf.com/



**Figure 26** Sensitive map of the Western Etang de Berre - Marina GARNIER, Marine BOISSAYE, Maud ONDET, Juliette PIHAN, Arnaud TRAN, Noha IBNMAJAH, l students of the Master AMUR ENPC 2021



Emotional maps, which allow for the expression of an experience of the territory (fig. 24 & 25)
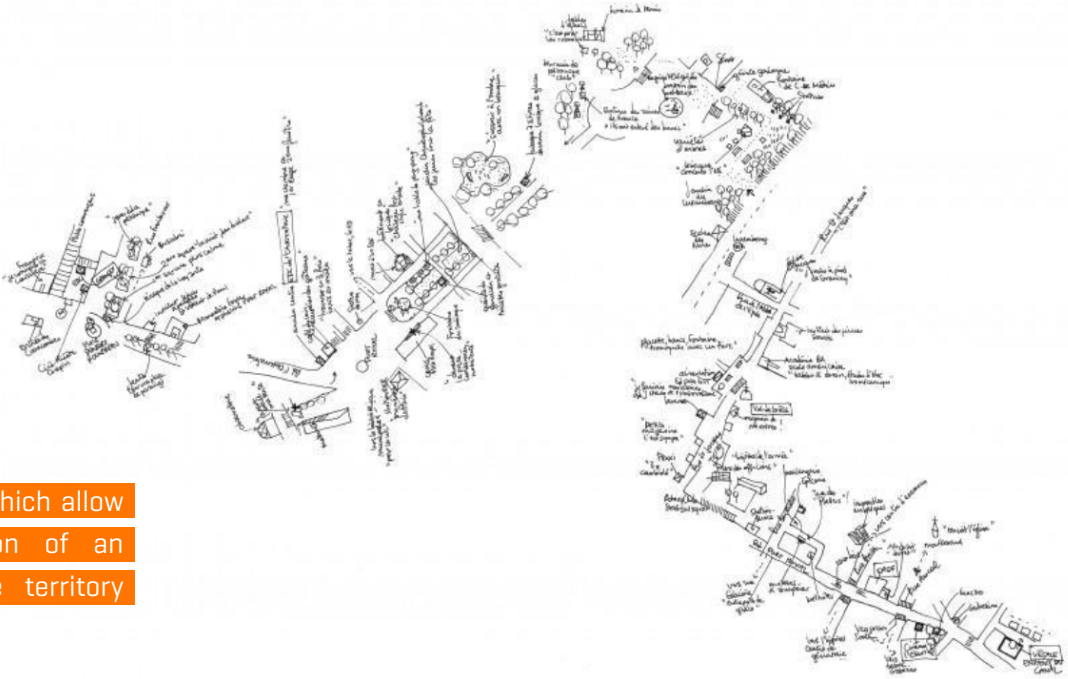
**Figure 25** Sensitive map of the St Jacques district (Paris), by Jacques, former homeless - Merril SINÉUS- for PEROU (Pôle d'Exploration des Ressources Urbaines)
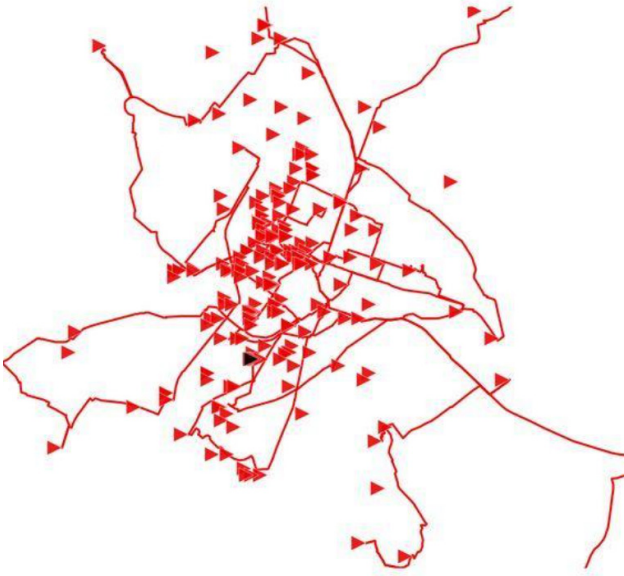


Sound, tactile, olfactory and taste maps, which show the sensory diversity of a territory (fig. 27)

**Figure 27** Participatory sound map of Brussels - http://www.bna-bbot.be/brusselssoundmap/
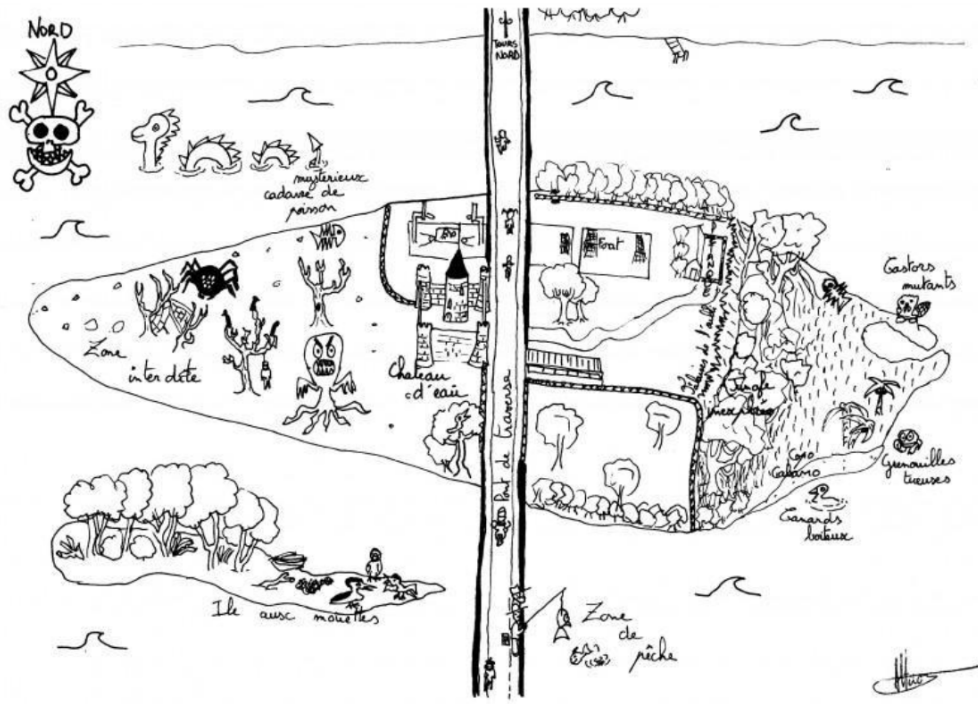
[31]  http://polau.org/pacs/test-page/

**Figure 28** Map of Aucard Island - Arthur HAOUY, Polytech Tours

These few examples illustrate the diversity of subjective and sensitive maps. The growing use of user experience in urban planning (or UX Urban Design) makes the sensitive map an increasingly used medium for reproducing the experience of the territory.
Apart from an artistic approach, the sensitive map does not emanate from nowhere but often comes from workshops and meetings organised by spatial planning actors, to gain knowledge of the administered territory or with a view to new planning: as illustrated in this article[32]. This tool can be mobilised for the purpose of expressing and restoring the quality of life in a territory.

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[32] Jirí Pánek, Emotional Maps: Participatory Crowdsourcing of Citizens' Perceptions of Their Urban Environment. Cartographic Perspectives (No. 91), 2018. (https://core.ac.uk/download/pdf/229652517.pdf)

# III/ BEYOND INDICATORS, URBAN DEVELOPMENT ROADMAPS

## 1.
## THE DOUGHNUT THEORY AND CITY PORTRAITS: A PROPOSAL FOR URBAN DEVELOPMENT

**1.1. The economic concept of the doughnut**

A new approach to urban development and planning is emerging, supported by the Doughnut Economics Action Lab, Circle Economy, C40 Cities and Biomimicry 3.8. It is based on the economic theory of **Kate RAWORTH**[33], and adjusts it to the city, in order to enable the theory to be applied and acted upon.

From an economic perspective, the doughnut concept is an alternative way of thinking about the prosperity of a society. Kate RAWORTH proposes to replace GDP with a new doughnut-shaped indicator.

For her, the search for exponential growth is heresy, the search for an increase in infinite GDP cannot be a viable economic end. While our economic system never envisages putting an end to this growth, it is urgent, in the face of multiple environmental, financial, social and health crises, that it enters the age of maturity.

As an alternative to the growth indicator (GDP), the doughnut is an alternative form of economic thinking that aims for balance and mobilises a diversity of indicators. The shape of the doughnut is telling. The small central circle represents the social foundation of society, being above it means being able to meet basic social needs (water, food, health, education, social justice...). The large outer circle represents the ecological ceiling. To exceed it means to put existence at risk (global warming, air pollution, etc.). The objective is therefore to be between the two circles, in the just and safe space for humanity, where the economy is regenerative and distributive. This circular form of economic model moves away from the linear growth model and encourages balance and moderation in order to satisfy the needs of all within the means of the planet (fig. 29).

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[33] Kate RAWORTH, A Safe and Just Space for Humanity, Oxfam GB, 2012 (online: https://www.oxfam.org/en/research/safe-and-just-space-humanity)
Kate RAWORTH , Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist, Random House Business, 2017, 384p.
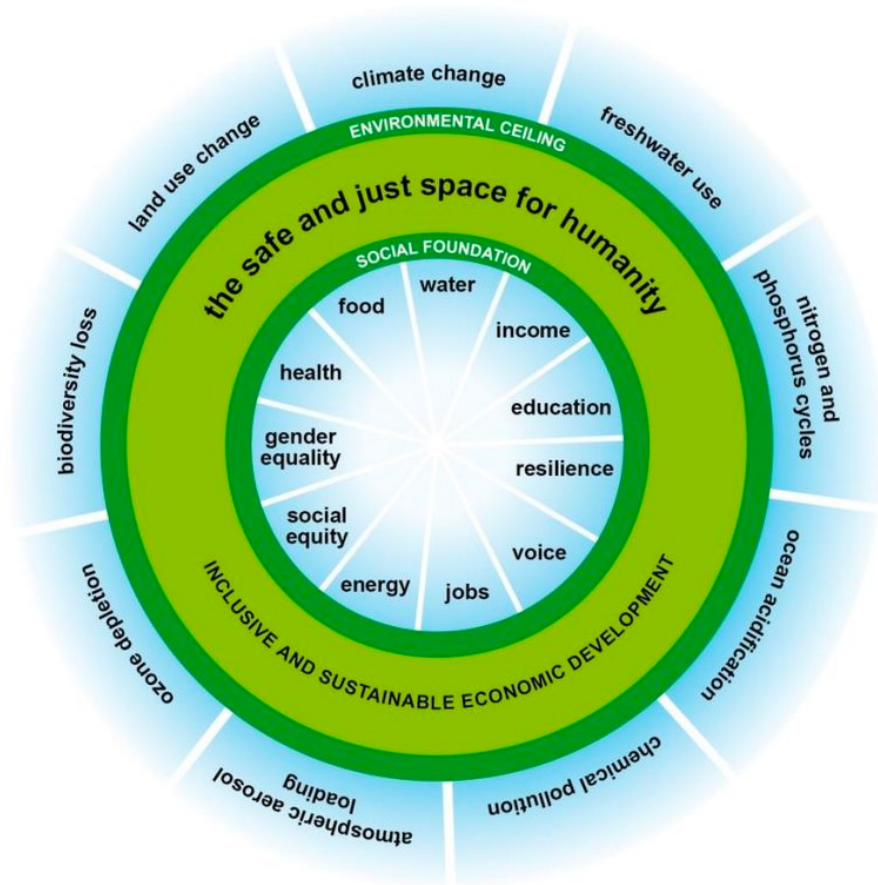
**Figure 29** The doughnut concept - Kate RAWORTH, Doughnut Economics

1) To assess the current state of the city taking into account various indicators, such as social equity, education or digital access.
2) To examine the ecological footprint of the city's various activities, beyond its own borders
3) To define a global economic and urban strategy

It opens with the question *"How can our city be a home to thriving people in a thriving place, while respecting the wellbeing of all people and the health of the whole planet?"*

### **1.2. The application of the doughnut theory to the urban environment**

The doughnut theory, applied to the city, offers new perspectives for rethinking urban development models in the service of social needs and ecology. From a post-Covid19 economic recovery perspective, cities represent a fertile ground for the implementation of the doughnut model.

Some cities in Europe and the United States[34] are already experimenting with this new systemic and holistic approach to urban policymaking. They are using **the city portrait tool**[35] **or Thriving Portrait City**, a transformative action tool derived from the doughnut concept, piloted by the Thriving Cities Initiative in Amsterdam, Philadelphia, and Portland. The use of this tool opens up a process of creating a development vision for the city, aiming at prosperity and well-being, locally and globally, for its inhabitants and for the planet. This analytical approach allows:



**Figure 30** Intricacy of the four indicators to measure well-being in the city - The Amsterdam City Doughnut

### **1.3. The four frameworks for reflection and analysis**

From this question, the evaluation and analysis are carried out through these four frameworks of reflection: social/local (1), ecological/local (2), ecological/global (3), social/global (4).

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34  Amsterdam, Philadelphia, Portland, Devon
35  Voir https://doughnuteconomics.org/Creating-City-Portraits-Methodology.pdf

## The social - local framework

For example, in the social-local framework [1], the question is asked on what prosperity means for the inhabitants/users of the city on a local scale. This answer is set alongside a measure of the current performance of the city. A decision process is applied, as shown in the following diagram (Figure 31).
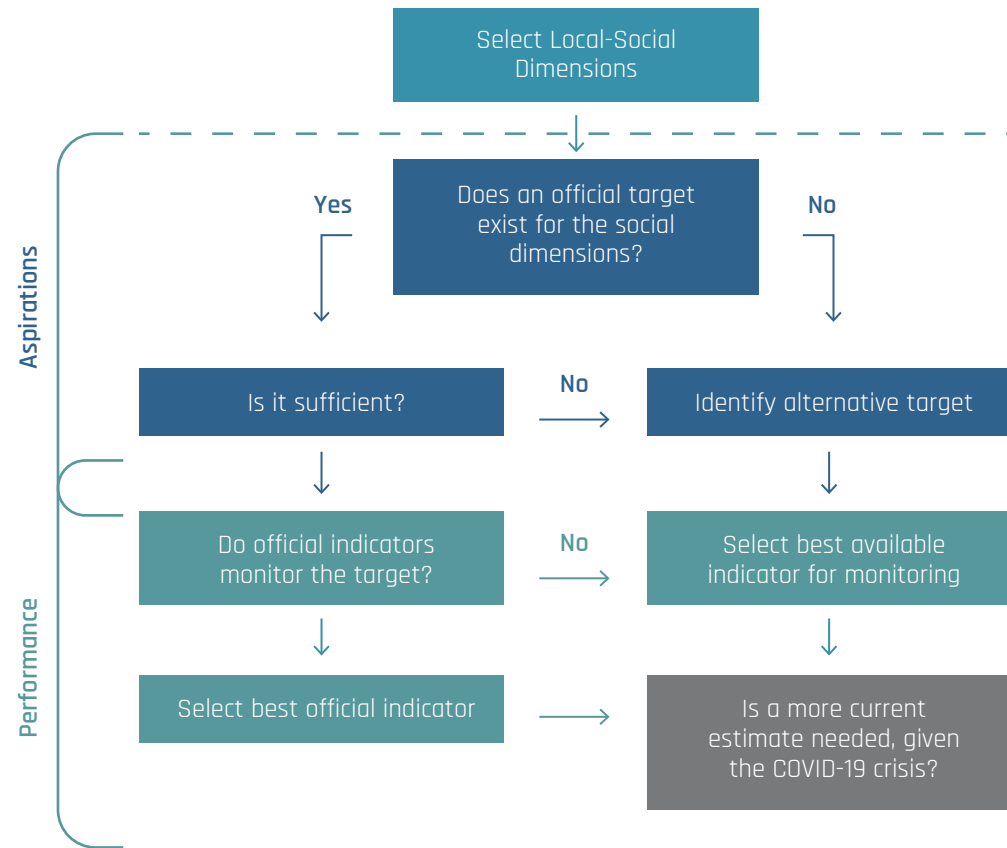


**Figure 31** Intricacy between local and social dimensions - Doughnuteconomics.org

In this process, the question of pre-existing official targets and the definition of prosperity for each city arises. Existing targets and indicators and pre-existing priorities were identified and categorised according to their scope, purpose, objective, and target date. The most relevant indicators were selected in a qualitative way and integrated into the sixteen sub-dimensions of the local/social category.
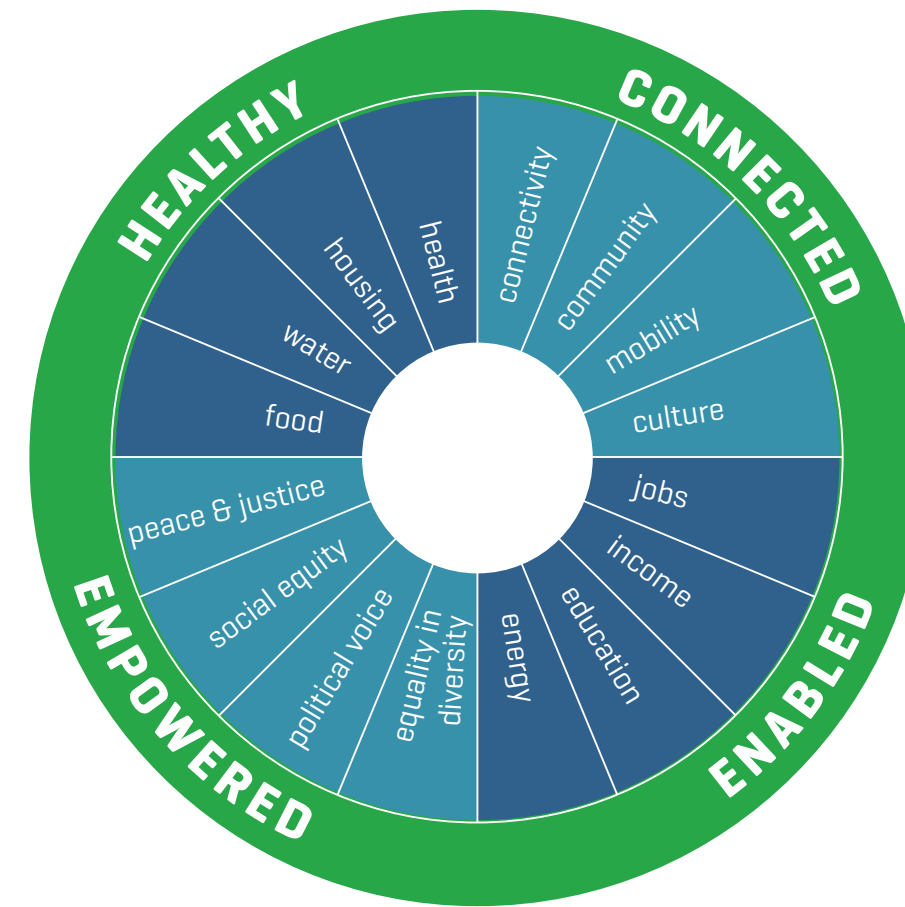


**Figure 32** The four dimensions of the Doughnut Theory - Doughnuteconomics.org

Source of indicators and data used:

- Cities websites and national statistical agencies
- ***The World Council on City Data (ISO citymetric for 60 cities)***

The World Council on City Data (WCCD) has developed and implemented three international urban data standards, recognised as the WCCD ISO 37120 series on city data. It includes indicators for sustainable cities (ISO 37120), indicators for smart cities (ISO 37122), indicators for resilient cities (ISO 37123). The WCCD has developed an audit protocol for cities of all sizes to compile and report these data, as well as a third-party verification and certification system to obtain ISO certification. For all three standards, a register of certified cities is available.

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36  https://www.dataforcities.org/global-cities-registry

The Council now works with 100 cities in 35 countries, and the data platform now includes more than 276 key performance indicators from the ISO 37120 series. These indicators provide an accurate baseline against which cities can monitor their progress and inform decisions about infrastructure, investment, services, and quality of life (Fig. 33).



**Figure 33** Indicators and themes - World Council on City Data

### The *World Database of Happiness (WDoH)*

This source is a database of all research on individual well-being. It consists of a bibliography of scientific publications on the subject and standardised extracts from the research. Two types of results/data are available: distributional results on the level of happiness of individuals at particular times and places and correlative results on the elements that impact happiness.

### *The SDG Tracker*

The SDG Tracker is a tool for monitoring the United Nations' Sustainable Development Goals (SDGs)[37]. It is based on the Our World in Data database, which itself uses official statistics from the UN and other international organisations.

Resources used:

### *The Ultimate Guide to the Genius of Place*

The "Genius of Place"[38] guide considers space through a biomimetic approach. The report compiles biological research and also proposes a catalogue of strategies adapted to the specificities of local ecosystems. These reports transform biological intelligence into design strategies.
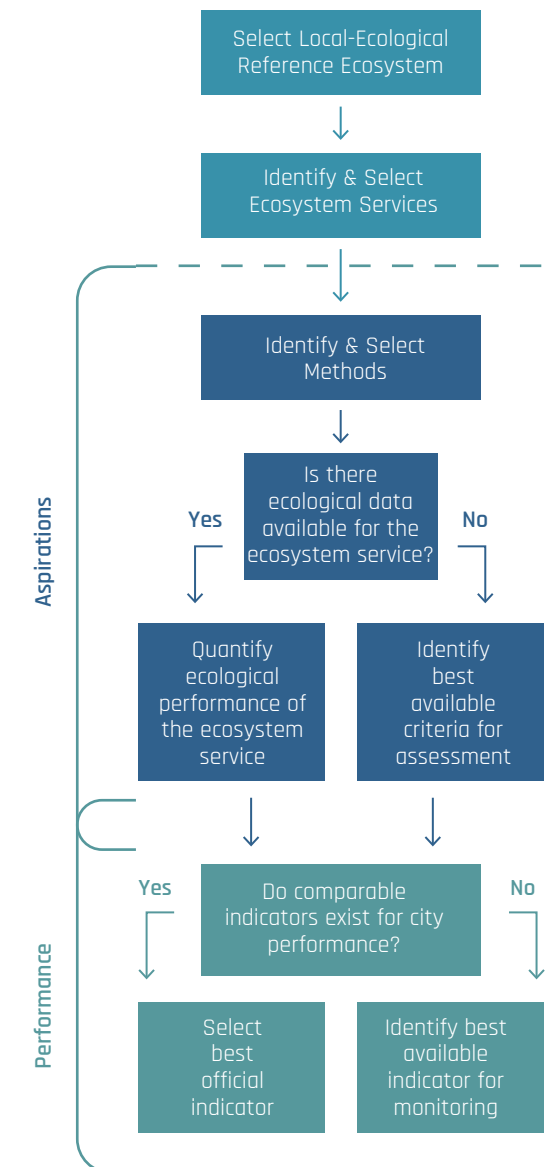
### 2005 Millennium Ecosystem Assessment

The Millennium Ecosystem Assessment (MA) is an international programme of work designed to meet the needs of decision-makers and the public for scientific information on the consequences of ecosystem change for human well-being and the options for responding to that change. The findings are compiled in five technical volumes and six synthesis reports that provide a scientific assessment of global ecosystem change and function.



**Figure 34** The relationship between the local and ecological dimensions - World Council on City Data

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[37] The 17 Sustainable Development Goals are defined in a list of 169 SDG targets. Progress will be monitored by 232 indicators. The full list and definitions are available at https://unstats.un.org/sdgs/indicators/Global%20Indicator%20Framework%20after%20refinement_Eng.pdf.

[38] https://synapse.bio/blog/ultimate-guide-to-genius-of-place#gopinfographic

### EcoRegions2017

The RESOLVE Ecoregions dataset, updated in 2017, provides a representation of the 846 terrestrial ecoregions of our planet. It is presented as an interactive map. Ecoregions are understood as ecosystems of regional areas. The 846 terrestrial ecoregions are grouped into 14 biomes (forested and non-forested) and 8 enveloping land areas called "realms".
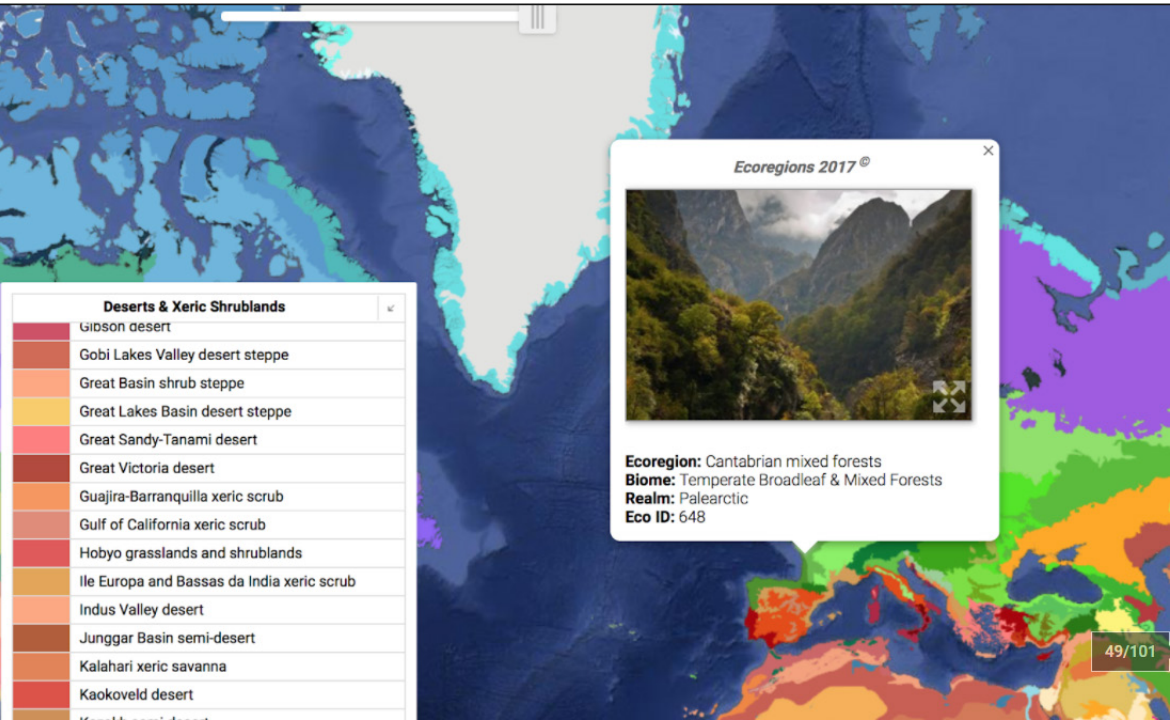


**Figure 35** Map interface for discovering the ecoregions created by Resolve - NGO Resolve (https://ecoregions.appspot.com/)

### The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) is an independent intergovernmental body that produces scientific assessments of the state of knowledge on biodiversity and natural ecosystems, as well as on tools and methods to conserve them. For the first programme of work, from 2014 to 2018, IPBES published several reports: 4 regional assessment reports, thematic reports (biodiversity scenarios and models, ecosystem services models, pollination and food production, land degradation and restoration), a global assessment on biodiversity and ecosystem services. The 2020-2030 work programme aims to support them.

### The World Air Quality Index

The Global Air Quality Index is a tool[39] that provides a real-time view of air quality as measured at over 30,000 stations in 130 countries. This non-profit project is run by a team of engineers based in China, Singapore, Australia, India and the United States.
The air quality index is based on the measurement of particulate matter (PM2.5 and PM10), ozone (O3), nitrous oxide, sulphur dioxide (SO2) and carbon monoxide (CO) emissions.
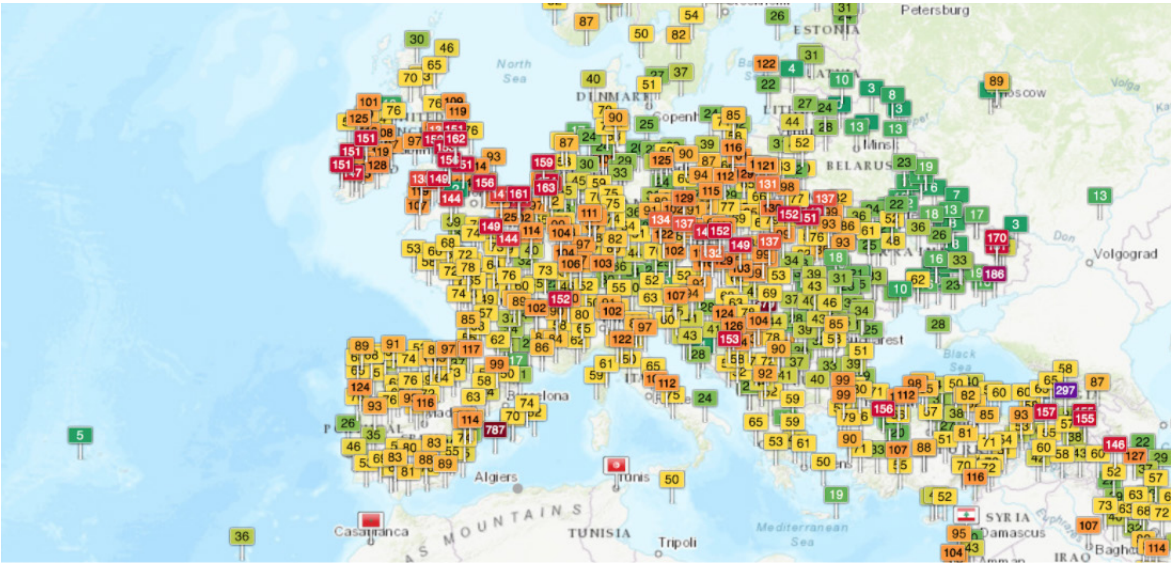


**Figure 36** Air quality indices in Europe and Asia Minor - World Air Quality Index.

### Green Facts

The Greenfacts initiative[40] is a website project that publishes clear summaries of scientific reports on health and environmental topics, produced by an independent scientific committee.

Data and resources used:

### Environmental Footprint explorers site

This website collects environmental footprint data from several international databases. It allows the extraction of country- or region-specific information.
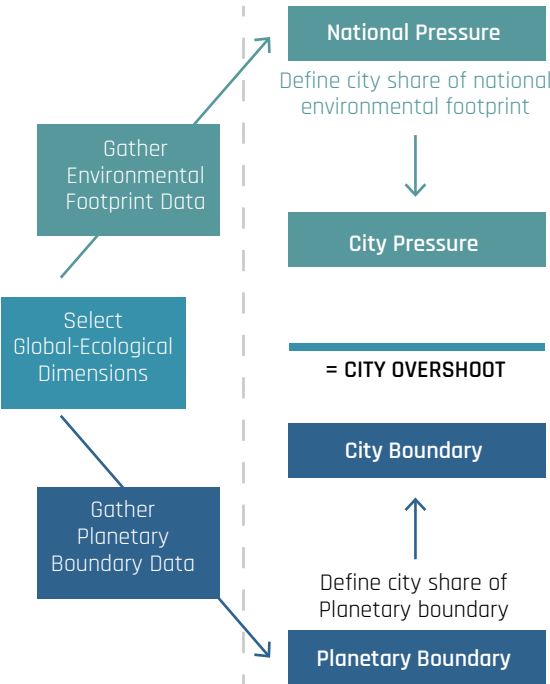


**Figure 37** The ecological and global dimensions - World Council on City Data

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[39] https://waqi.info/fr/#/c/5.062/0.352/2z
[40] https://www.greenfacts.org/fr/

## EXIOBASE

Exiobase is an open access tool based on a global MRIO (multi-region input-output) database. It allows the identification and analysis of externalities linked to globalized production and is therefore a database for analysing the environmental impacts of economic activity. The reprocessing of the data involves a choice of geographical segmentation over 43 countries that represent 95% of the world economy. The segmentation chosen is 129 sectors, which requires an in-depth sectoral breakdown. EXIOBASE also provides environmental indicators on 40 chemical emission types and 80 resource types.

The data can be downloaded from https://www.exiobase.eu

## The Global Footprint Network's Open Data Platform

*The Global Footprint Network*'s Open Data Platform makes available the data needed for any ecological footprint analysis. The National Footprint Accounts measure the ecological resource use and capacity of nations over time. These accounts are based on 15,000 data records per country per year, for over 200 countries, territories, and regions. These calculations are based on data sets from international organisations (United Nations, International Energy Agency).

The visualization tool of the platform[41] allows easy access to the following results:

- the deficit and ecological reserve
- in total ecological footprint
- in ecological footprint per person
- in total biocapacity
- in biocapacity per person.
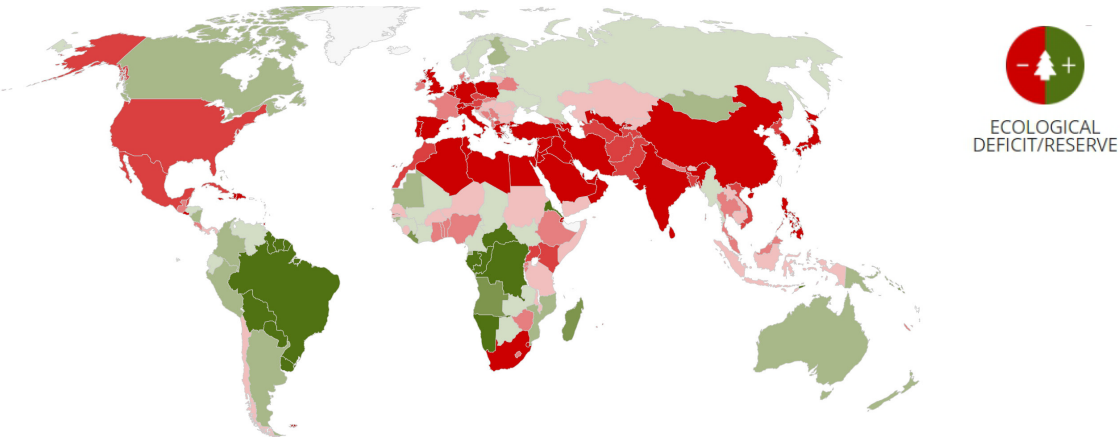
### PLATFORM VISUALIZATION - GLOBAL FOOTPRINT NETWORK



ECOLOGICAL
DEFICIT/RESERVE

**Figure 38** Platform visualization - Global Footprint Network

41 https://data.footprintnetwork.org/#/

## EORA

EORA is a global MRIO supply chain database model. Initiated by the Australian National Research Council, it is one of the most important MRIO models today. The model uses several data sources: national statistical services, United Nations databases, the United Nations International Trade in Goods Database (COMTRADE), the United Nations International Trade in Services Database (SERVICETRADE) and has been supplemented with 35 types of environmental indicators . The database has time series from 1990 to 2009.

## The *Urban-Metabolism for Resource-Efficient Cities* resources *of the Global Initiative for Resource-Efficient Cities*

This report[43] is a review of assessment tools that can guide a transition to resource efficiency at the city scale. It is based on the concept of urban metabolism, proposing a reading of each urban form in its metabolic form (e.g., transport is a flow of energy, water, waste, people).

### URBAN FORMS AND THEIR RESOURCES - GLOBAL INITIATIVE FOR RESOURCE EFFICIENT CITIES

An illustration of urban form, metabolic flows and
resource-efficiency leverage points' linkages, relevant for urban practitioners

| Specific potential local government interventions | Urban form | Metabolic flows | Resource efficiency leverage points |
|---|---|---|---|
| Promotion of walking and cycling<br><br>Optimisation of private car use (carpooling; car sharing)<br><br>Attractiveness of public transport | Transport | Energy<br>Water<br>Waste<br>People | • Energy efficiency of transportation<br>• Water-use efficiency intransportation sector<br>• Carbon emissions intensity of transportation |
| Land use mix<br>Open and green spaces<br>Protected areas | Land uses | Energy<br>Water<br>Waste<br>People | • Compactness<br>• Population density<br>• Centrality of the city |

**Figure 39** Urban forms and their resources - Global Initiative for resource Efficient Cities

42 http://carbonconsumptionsurvey.eu/wp-content/uploads/2015/07/CCS-MRIO-Review_L1-1.pdf
43 https://resourceefficientcities.org/wp-content/uploads/2017/09/Urban-Metabolism-for-Resource-Efficient-Cities.pdf
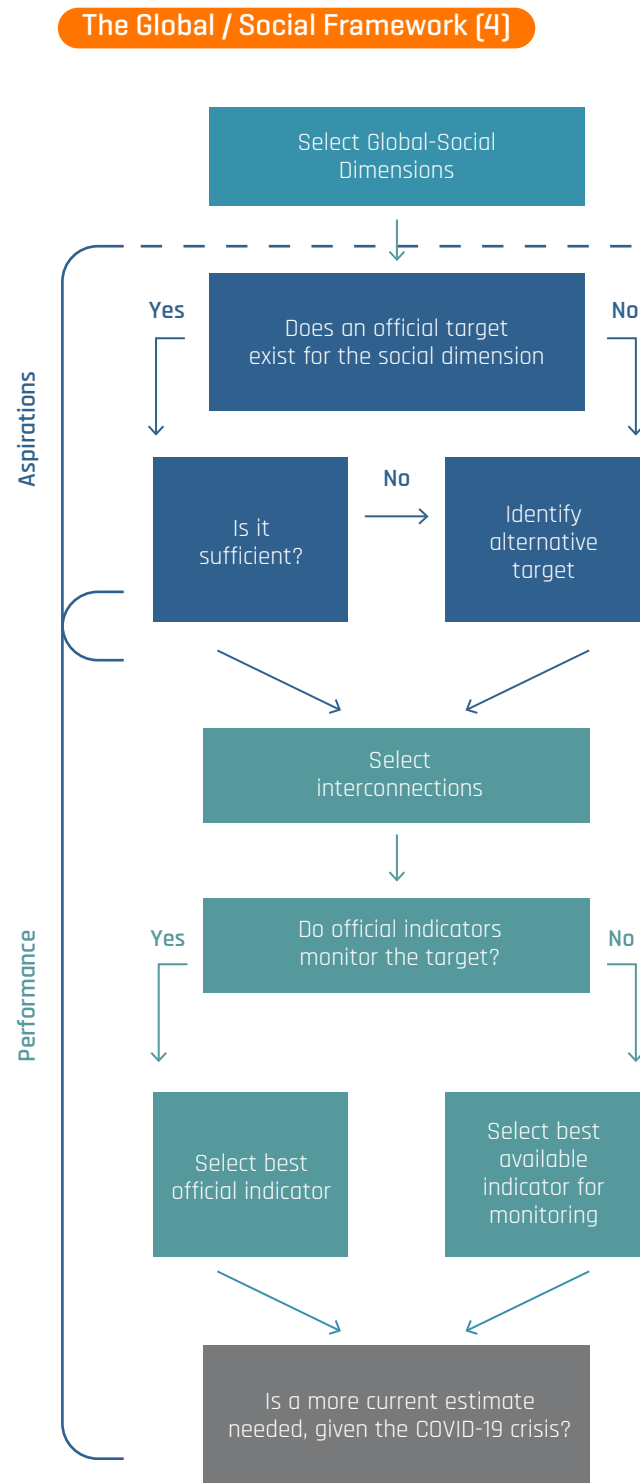
## The Global / Social Framework [4]



**Figure 40** Global and social dimensions - World Council on City Data

These are used resources from the *Clean Clothes Campaign website*.

This global network dedicated to improving working conditions and empowering workers in the global garment industries provides data on wages, workplaces, poverty, labour contracts, solidarity and most recently on the Covid crisis through its reports.

The method and indicators developed by Oxfam for its *Oxfam behind the brand* campaign provide data on the policies of large food companies, on issues ranging from water and gender issues to measures of their impact on workers and farmers. This study and campaign focus on the ten largest food companies, which were given a score from 0 to 10 from 2013 to 2016[44].



**Figure 41** Action to report on the actions of food companies - Oxfam

### The Living Income Community of Practice

This community of practice offers a variety of methodologies for calculating living wage and real income. Based on several data sources, an income benchmark has been produced and is available online[45].

### The Fairtrade International organisation

Data on Fair Trade is available on the website of the International Fair-Trade Organisation. The NGO *Fairtrade International* provides data on the organisation's partner producers. These are from the following sectors: coffee, cocoa, cotton, sugar, tea, flowers, and bananas. There are also data and maps on the risks of deforestation.

### KnowTheChain

This website has benchmarks and practical resources for companies and investors to use to combat forced labour in global supply chains.

### *The Environmental Justice Atlas*

The Environmental Justice Atlas documents and records social conflicts related to the environment: defence of land, air, water, forests, livelihoods.
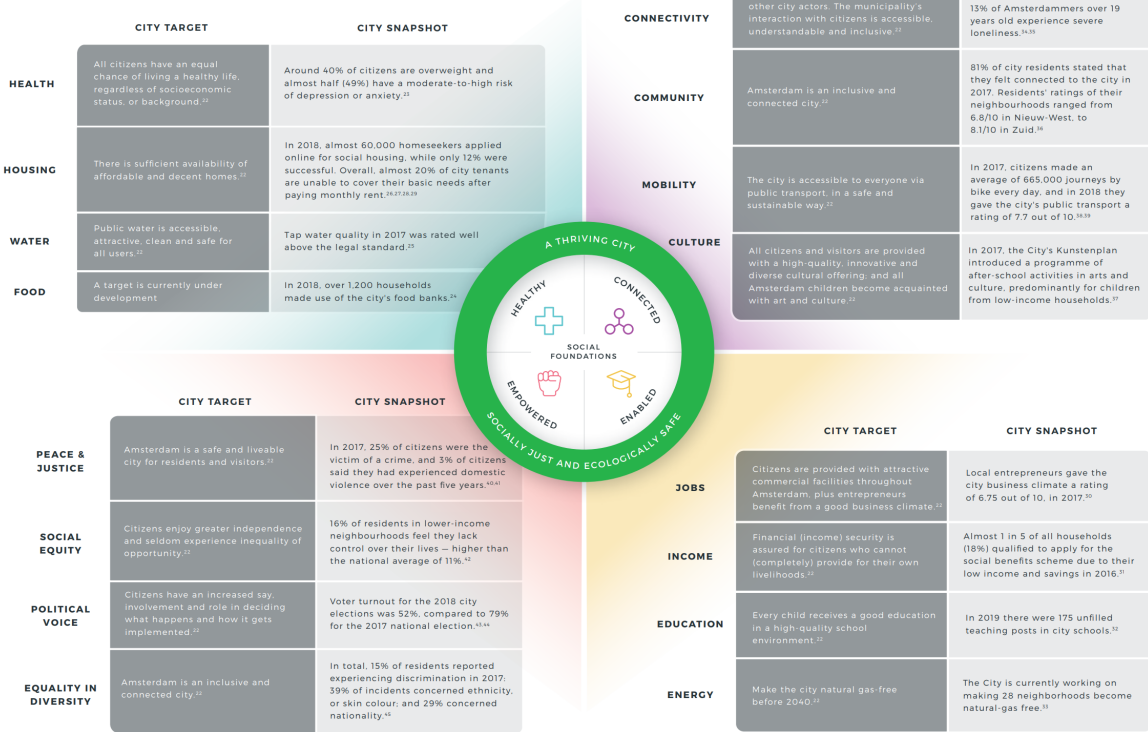
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44  https://www.behindthebrands.org/company-scorecard/

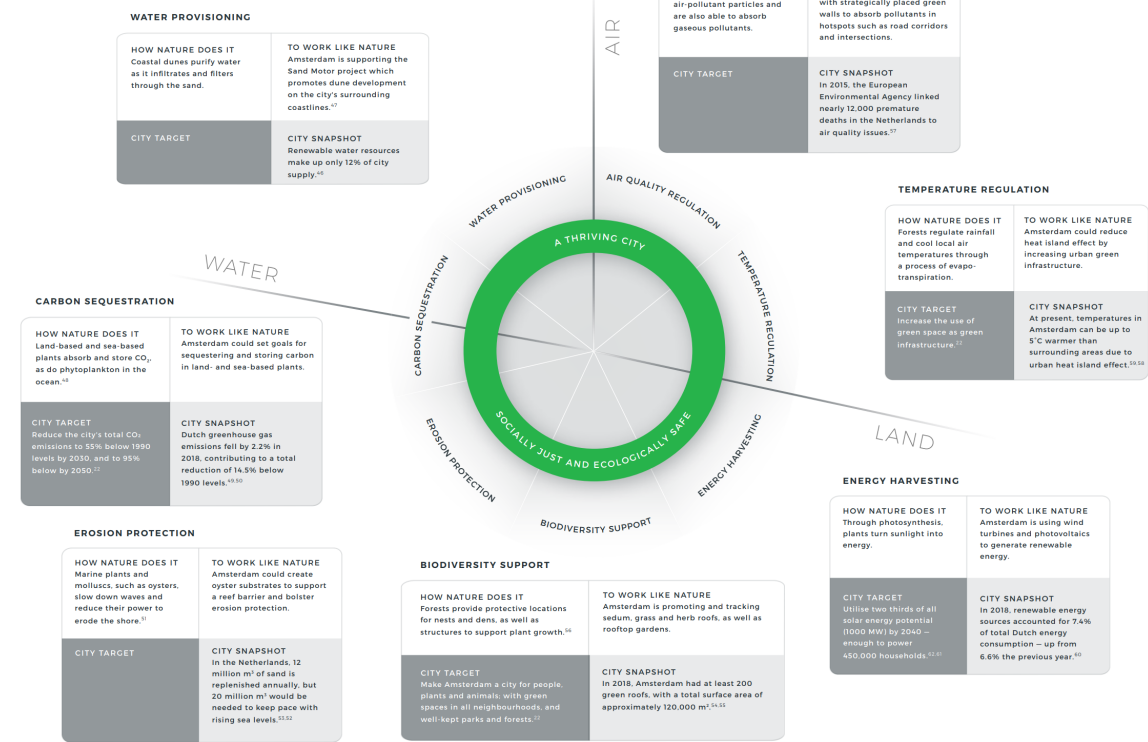45 https://www.living-income.com/living-income-benchmarks

## 1.4. City portraits

In the end, the answers to the four questions make it possible to create the city portrait as shown below for Amsterdam (fig. 42).
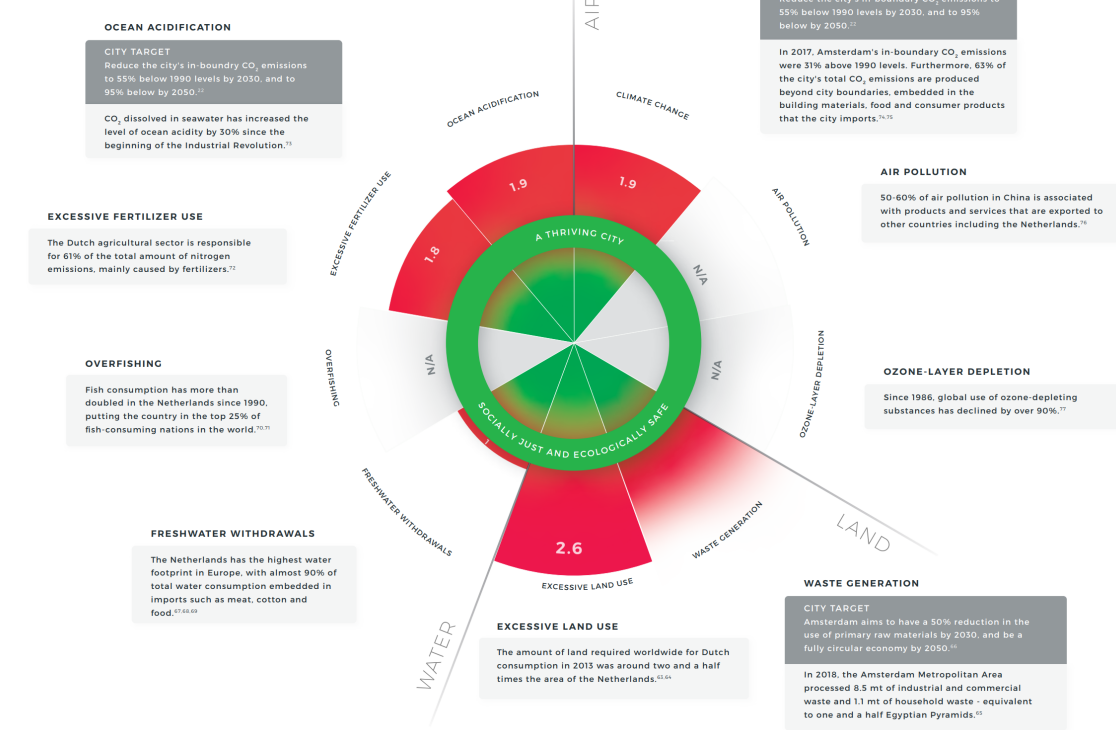
### WHAT WOULD IT MEAN FOR THE PEOPLE OF AMSTERDAM TO THRIVE?



### WHAT WOULD IT MEAN FOR AMSTERDAM TO THRIVE WITHIN ITS NATURAL HABITAT?



### WHAT WOULD IT MEAN FOR AMSTERDAM TO RESPECT THE HEALTH OF THE WHOLE PLANET?



### WHAT WOULD IT MEAN FOR AMSTERDAM TO RESPECT THE WELLBEING OF PEOPLE WORLDWIDE?
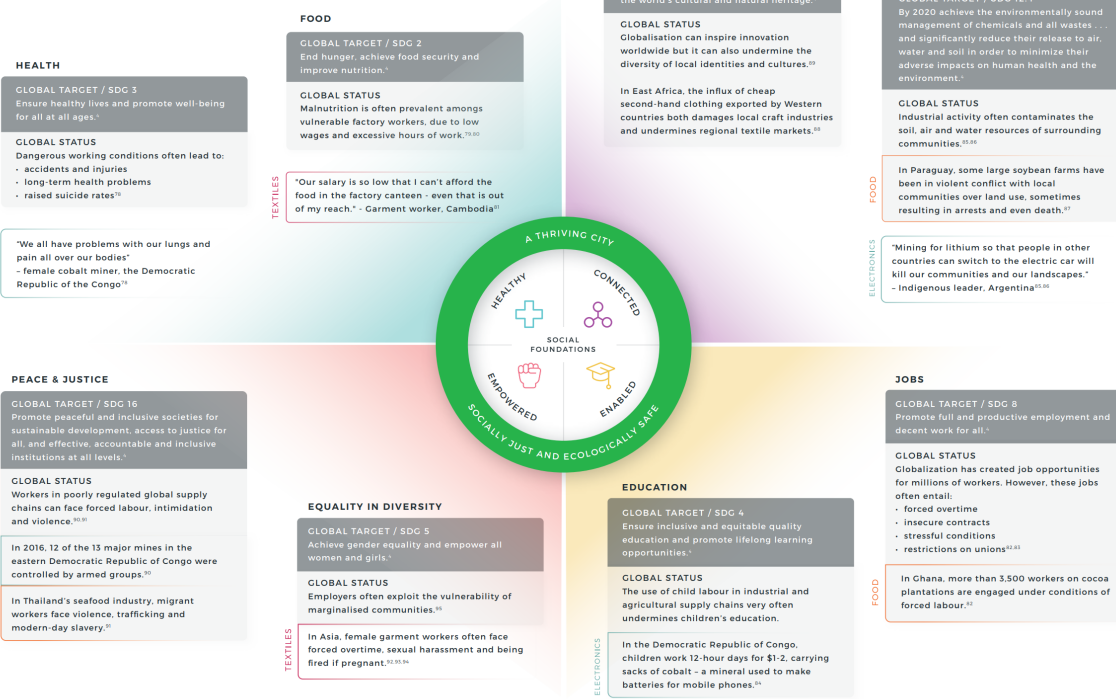


**Figure 42** City portrait - Amsterdam City Portrait, The Amsterdam City Doughnut

The data used are the public data available in the experimental cities. The next stage of appropriation and implementation would be to move from the public portrait to the "city selfie" thanks to the contribution of personal data from inhabitants, business owners, visitors: stories, images, visions, proposals, initiatives, existing policies, entrepreneurial initiatives, etc.
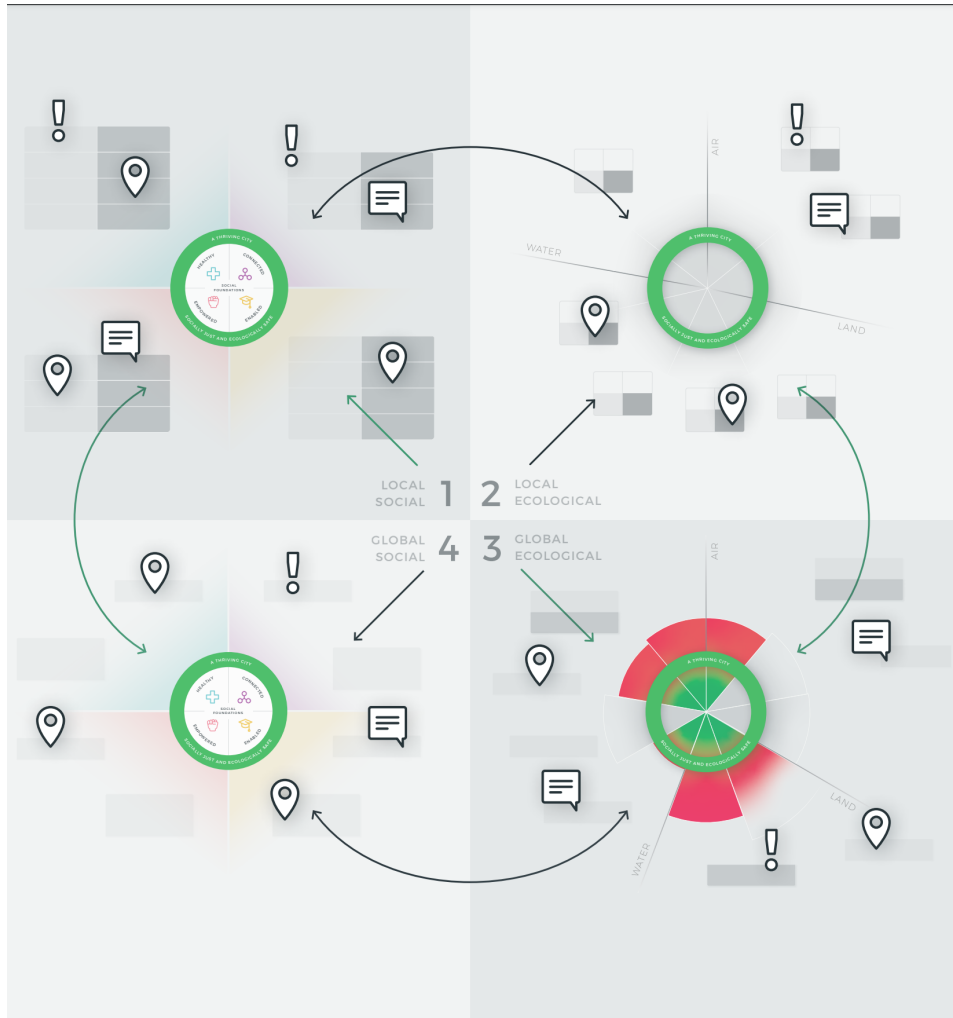
**Figure 43** City portraits in the four dimensions: local, social, global and ecological - Amsterdam City Portrait, The Amsterdam City Doughnut

The city portrait is therefore a starting point for opening up new ways of thinking, sharing inspiration and transformative action to become a thriving city for people and the planet, locally and globally. To go beyond the reflection stage, it needs to be used and reflected in local policy making.

The most successful example of the use of this theory and tool is the city of Amsterdam, which opted for a post-Covid economic and territorial recovery programme based on the doughnut model on the 8th of April 2020. The city has embarked on a circular economy policy, which is in line with the ambitions set out in its City Portrait. In order to accelerate action, make the approach audible and ensure its credibility, a local cross-sector coalition, the *Doughnut Coalition*, has been created. It brings together more than twenty organisations (design agencies, schools and universities, neighbourhood associations, think and do tanks, social enterprises, municipalities) that use the Doughnut Theory in their work[46].

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46 Pour en savoir plus voir la publication *The Amsterdam City Doughnut* :
   https://www.kateraworth.com/wp/wp-content/uploads/2020/04/20200416-AMS-portrait-EN-Spread-web-420x210mm.pdf

The implementation is done through so-called *Dougnut workshops* and *Doughnut deals*: deals to recognise community projects that contribute to bringing the city into the Doughnut - between the two circles - because of their positive social and ecological consequences.

Devon has also embarked on the process, experimenting with specific indicators for **revitalisation areas**.

Beyond these pioneer cities, the ambition is to create an international movement of cities applying the doughnut theory. Such a dynamic would make sense in order to make the measures envisaged in the global axis effective for each of the cities.

# 2.
# 15-MINUTE CITY,
# 30-MINUTE TERRITORY,
# AND HIGH QUALITY OF SOCIETAL LIFE INDEX

**2.1 The 15-Minute City and the 30-Minute Territory models : a paradigm shift in global urban planning**

The concept of the 15-Minute City and the 30-Minute Territory, popularised by Professor Carlos Moreno at the IAE Paris Sorbonne based Research Lab Chaire ETI, also proposes an innovative approach to complex urban development challenges. This vision and scientific methodology places hyper-proximity at the service of quality of life, to draw the contours of a desirable, viable and sustainable city. It is an approach to the sustainable city through polycentrism that offers a new response to sustainable urban development.

Introducing the notion of "acceptable" or "reasonable" access time for people (walking or cycling from their home base) to reach essential services and activities, the 15-Minute City is a paradigm shift from traditional urban strategies. It questions the use of time and space by individuals, set alongside the spatial and temporal organisation of the city. In order to empower residents to reclaim possession of their time, and to revitalise their neighbourhoods, the "15-Minute City" and the "30-Minute Territory" models provide them with the possibilitý to find in hyper-proximity an answer to their essential needs: housing, working, basic supplies, healthcare services, education, cultural and leisure activities (fig. 44). **This approach is not a new urban circulation plan but a new urban vision of a polycentric territory.**

Figure 44 *The 6 social functions Model of the 15-Minute City Concept- Chaire ETI .*

The 15-Minute City (or 30-Minute Territory) model ties together in a systemic way urban projects and policies to address societal, climate and environmental change and to improve inhabitants well-being. This requires an effective offering of local services (representing the 6 social functions), accessible via active mobility paths or decarbonized public transportation and enabled by digital tools.

This virtuous model of urban development is the convergence of three concepts:

- **chrono-urbanism,** which refers to the study of the temporal dimension of urban planning. By analysing the built environment in terms of flows, movements, and time-use and more broadly how time affects urban form, infrastructure, and social interactions, chrono-urbanism seeks to integrate the time variable in the same way as the spatial one in the study and design of urban spaces.
- **chronotopia,** is a term used to describe the evolution of the use of a place according to the time factor. As a response to the limited quantity of available space in dense urban environments, by questioning pre-existing uses of spaces and by reflecting on the rhythmic sequences, chronotopia seeks to make the best use of each and every square meter by proposing multiple possible uses.
- **topophilia,** is a term used to describe the affective (and subjective) bond between people and their environment, particularly their love for and attachment to specific places. It is often used to describe the deep emotional connections that people have with certain locations, whether they be urban or natural, and the ways in which these places shape our identities and sense of belonging.

2020 can be considered a pivotal year for a lot of disciplines and stakeholders around the world and urban planning professionals, city leaders and policy makers are no exception. The 15-Minute City -and to a lesser extent the 30-Minute Territory- model was put on the global strategic agenda as a ripple effect of both Covid-19 pandemic and the adoption of the 2030 Sustainable Development Goals Program.

The proposals of the 15-Minute City in particular echo the needs arising from environmental and health emergencies: an urban organisation that limits the environmental impact of city life through a significant reduction in carbon-based travel, where residents can satisfy their essential needs close to their homes and which, through its quality of life, fosters their attachment to their place of living and their well-being.

For these reasons, the 15-Minute City has opened up a global discussion on desirable urbanism, in contexts of crisis and urban reconfiguration. It has been integrated into the common agenda adopted by the *C40 Cities* mayors to emerge from the health crisis, and several major players have seized this concept to draw the contours of the city of tomorrow: resilient, desirable, and sustainable.

### 2.2. Measuring the High Quality of Societal Life (HQSL), a prerequisite for the 15-Minute City

Within the framework of the implementation of the 15-Minute City and the 30-Minute Territory, the quality of life is taken into account in both a spatial and temporal perimeter. It is apprehended through an objective of High Quality of Societal Life induced by the proximity of the six essential social functions, crossed with an objective of well-being, sociability, and sustainability.

Faced with the absence of an adequate indicator, Chaire ETI researchers have undertaken **the development of a method for measuring the quality of life that a territory provides through the distribution and diversity of services it offers to its inhabitants within chosen accessibility time frames.**

Objectives of the research work carried out by Chaire ETI :

- Elaborate a detailed geographic representation of existing urban and territorial services and amenities by access time modalities (i.e.: functional coverage),
- Define "urban proximities" for different user profiles based on gender, demographic, economic, physical, or social characteristics,
- Calculate and compare the Quality of Societal Life score by modelling the level of accessibility and diversity of services and equipment provided at different scales: neighbourhood, city or territory,
- Develop use cases for this methodology including material for stakeholders participatory activities

These elements represent the scientific corpus of the 15-Minute City or 30-Minute Territory methodology. A dedicated digital platform was created to enable geodata calculation, HQSL scoring, comparison and visualization. A set of participatory and creative tools was designed to engage and empower stakeholders to envision life style and practices change

Part 2 of this white paper presents the methodology and related tools.

# PART 2:
# HIGH QUALITY OF SOCIETAL LIFE METHODOLOGY

# I/ ONTOLOGY OF THE 15-MINUTE CITY

## 1.
## CONSTRUCTION AND CONTENT OF THE ONTOLOGY

The 15-Minute City and the 30-Minute Territory models are structured by an ontology. It constitutes the structured set of terms and concepts that specify this urban model. Six social functions are found at the root and are then specified by sub-categories (tab. 5).

| HQSL: elements and facilities integrated into the six social functions - Chaire ETI | | | | | |
|---|---|---|---|---|---|
| **LIVING** | **WORKING** | **GETTING SUPPLIES** | **ENJOYING** | **LEARNING** | **CARING/ BEING HEALTHY** |
| Housing Energy Waste management Transportation Services / Infrastructure | Environment Access Diversity Services | Food Non-food related consumption Public services | Holidays Culture Leisure Association | Access Availability Performance Guide | Access to care Prevention Emergency Living environment Wellness Sport Pollution |

**Table 5** HQSL: elements and facilities integrated into the six social functions - Chaire ETI

## 2.
## FROM ONTOLOGY TO THE "HIGH QUALITY OF SOCIETAL LIFE MATRIX"

The objective of the research project on the 15-Minute City is to constitute, from the ontology of societal functions and their sub-categories, a matrix of the High Quality of Societal Life. This matrix would propose a reading grid of the territory, by spatializing the lacks and highlighting the accessibility of the essential functions of a given perimeter.

To do this, societal functions are cross-referenced with three characteristics: well-being, sociability and sustainability or inclusive planet (Fig. 45).
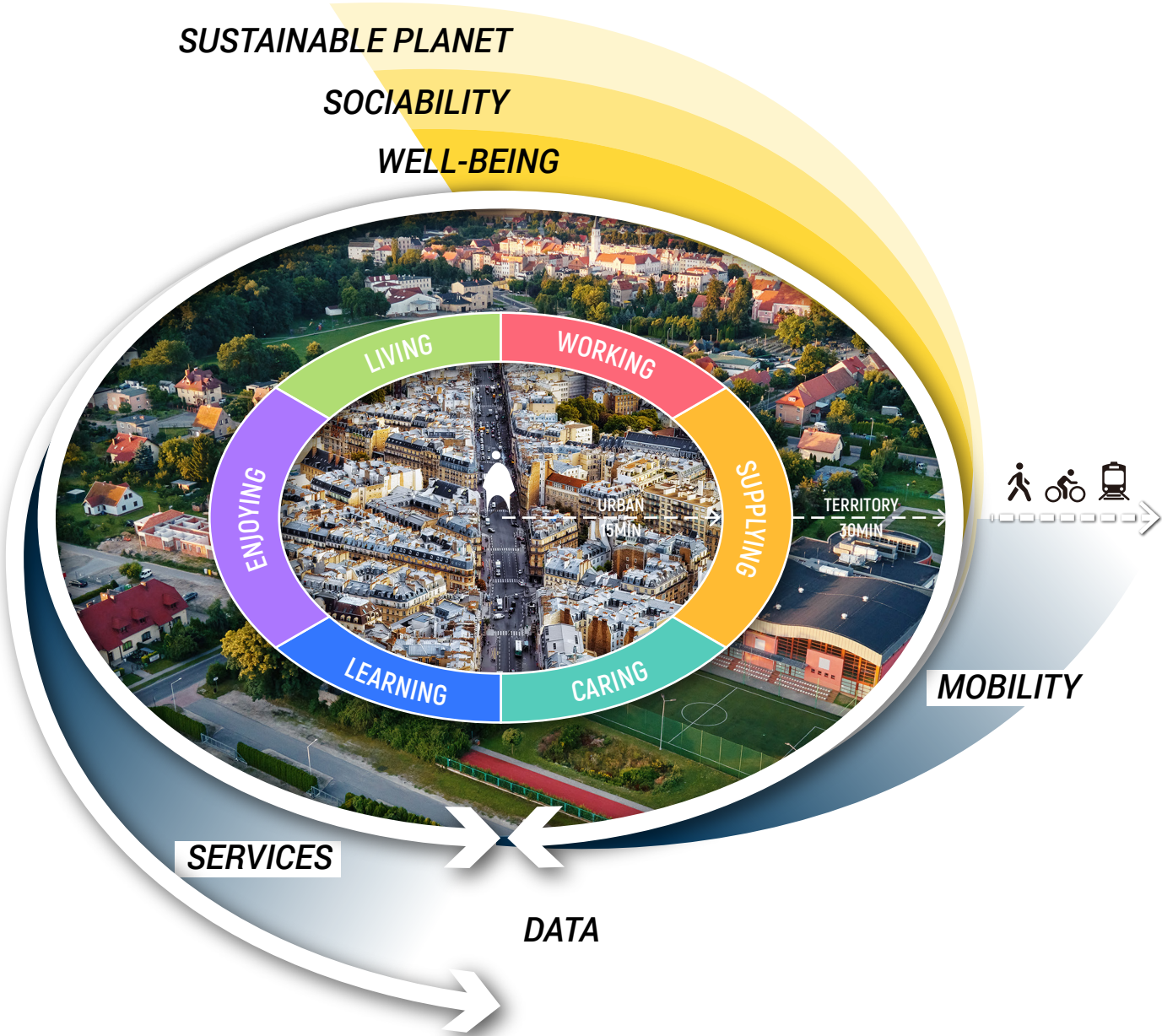
**Figure 45** Objectives of the 15-Minute City - Chaire ETI

Based on these elements of the matrix, its effective implementation involves associating each societal function and each sub-category with uses, activities and infrastructures. This step makes it possible to specify what anchors a function on a territory, what makes it effective. The following ontology is obtained (fig. 46).
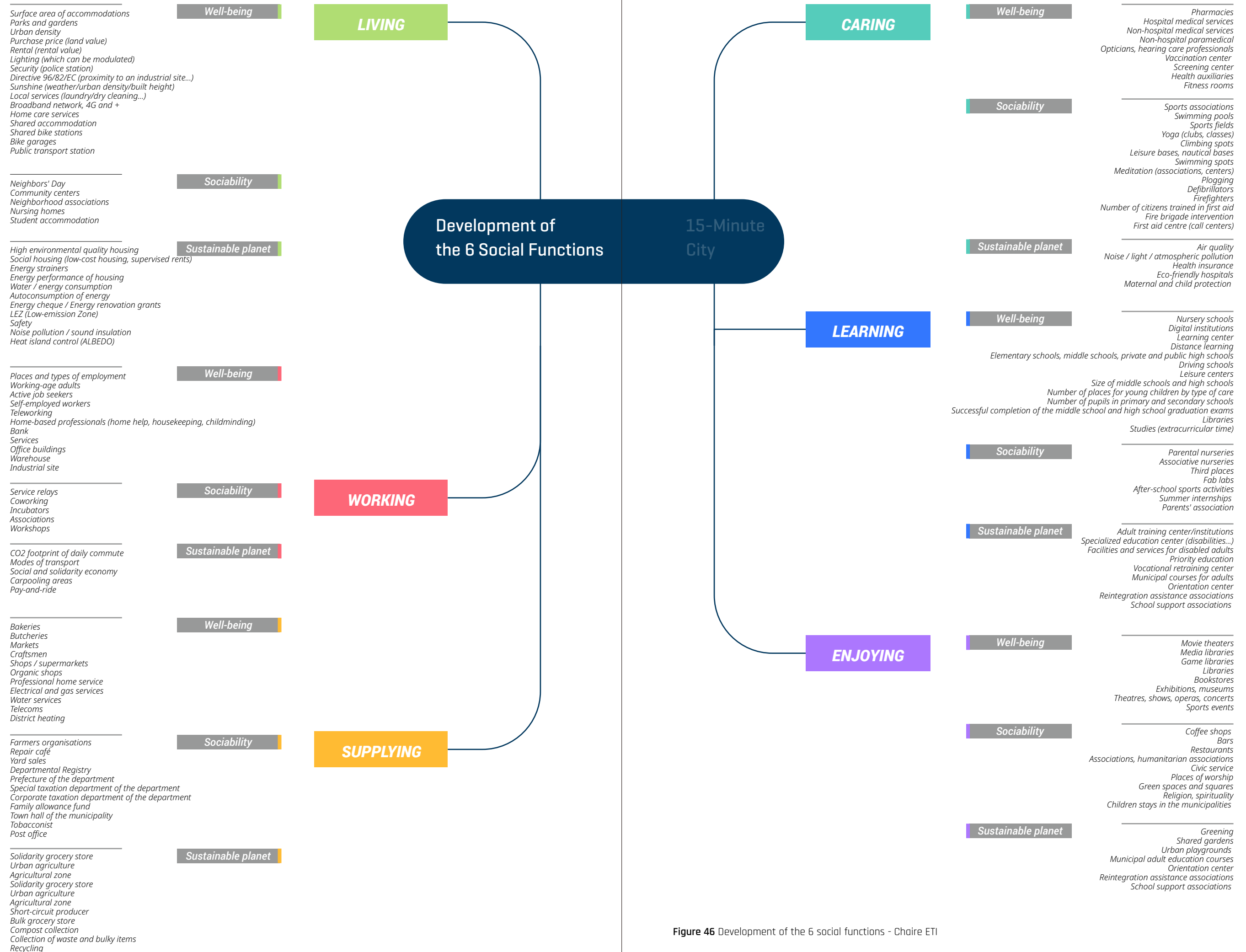
# Development of the 6 Social Functions — 15-Minute City

## LIVING

**Well-being**
- Surface area of accommodations
- Parks and gardens
- Urban density
- Purchase price (land value)
- Rental (rental value)
- Lighting (which can be modulated)
- Security (police station)
- Directive 96/82/EC (proximity to an industrial site...)
- Sunshine (weather/urban density/built height)
- Local services (laundry/dry cleaning...)
- Broadband network, 4G and +
- Home care services
- Shared accommodation
- Shared bike stations
- Bike garages
- Public transport station

**Sociability**
- Neighbors' Day
- Community centers
- Neighborhood associations
- Nursing homes
- Student accommodation

**Sustainable planet**
- High environmental quality housing
- Social housing (low-cost housing, supervised rents)
- Energy strainers
- Energy performance of housing
- Water / energy consumption
- Autoconsumption of energy
- Energy cheque / Energy renovation grants
- LEZ (Low-emission Zone)
- Safety
- Noise pollution / sound insulation
- Heat island control (ALBEDO)

## WORKING

**Well-being**
- Places and types of employment
- Working-age adults
- Active job seekers
- Self-employed workers
- Teleworking
- Home-based professionals (home help, housekeeping, childminding)
- Bank
- Services
- Office buildings
- Warehouse
- Industrial site

**Sociability**
- Service relays
- Coworking
- Incubators
- Associations
- Workshops

**Sustainable planet**
- CO2 footprint of daily commute
- Modes of transport
- Social and solidarity economy
- Carpooling areas
- Pay-and-ride

## SUPPLYING

**Well-being**
- Bakeries
- Butcheries
- Markets
- Craftsmen
- Shops / supermarkets
- Organic shops
- Professional home service
- Electrical and gas services
- Water services
- Telecoms
- District heating

**Sociability**
- Farmers organisations
- Repair café
- Yard sales
- Departmental Registry
- Prefecture of the department
- Special taxation department of the department
- Corporate taxation department of the department
- Family allowance fund
- Town hall of the municipality
- Tobacconist
- Post office

**Sustainable planet**
- Solidarity grocery store
- Urban agriculture
- Agricultural zone
- Solidarity grocery store
- Urban agriculture
- Agricultural zone
- Short-circuit producer
- Bulk grocery store
- Compost collection
- Collection of waste and bulky items
- Recycling

## CARING

**Well-being**
- Pharmacies
- Hospital medical services
- Non-hospital medical services
- Non-hospital paramedical
- Opticians, hearing care professionals
- Vaccination center
- Screening center
- Health auxiliaries
- Fitness rooms

**Sociability**
- Sports associations
- Swimming pools
- Sports fields
- Yoga (clubs, classes)
- Climbing spots
- Leisure bases, nautical bases
- Swimming spots
- Meditation (associations, centers)
- Plogging
- Defibrillators
- Firefighters
- Number of citizens trained in first aid
- Fire brigade intervention
- First aid centre (call centers)

**Sustainable planet**
- Air quality
- Noise / light / atmospheric pollution
- Health insurance
- Eco-friendly hospitals
- Maternal and child protection

## LEARNING

**Well-being**
- Nursery schools
- Digital institutions
- Learning center
- Distance learning
- Elementary schools, middle schools, private and public high schools
- Driving schools
- Leisure centers
- Size of middle schools and high schools
- Number of places for young children by type of care
- Number of pupils in primary and secondary schools
- Successful completion of the middle school and high school graduation exams
- Libraries
- Studies (extracurricular time)

**Sociability**
- Parental nurseries
- Associative nurseries
- Third places
- Fab labs
- After-school sports activities
- Summer internships
- Parents' association

**Sustainable planet**
- Adult training center/institutions
- Specialized education center (disabilities...)
- Facilities and services for disabled adults
- Priority education
- Vocational retraining center
- Municipal courses for adults
- Orientation center
- Reintegration assistance associations
- School support associations

## ENJOYING

**Well-being**
- Movie theaters
- Media libraries
- Game libraries
- Libraries
- Bookstores
- Exhibitions, museums
- Theatres, shows, operas, concerts
- Sports events

**Sociability**
- Coffee shops
- Bars
- Restaurants
- Associations, humanitarian associations
- Civic service
- Places of worship
- Green spaces and squares
- Religion, spirituality
- Children stays in the municipalities

**Sustainable planet**
- Greening
- Shared gardens
- Urban playgrounds
- Municipal adult education courses
- Orientation center
- Reintegration assistance associations
- School support associations

**Figure 46** Development of the 6 social functions - Chaire ETI

# 3.
# FROM SOCIAL FUNCTIONS
# TO INDICATORS

Taking into account the perception of inhabitants or workers of a social function is an additional way of defining what makes it exist in the eyes of users and what their expectations are. This makes it possible to specify the ontology previously explained and to define quantifiable and measurable elements, in order to make the HQSL matrix a tool for territorial perception and prospective.

To this end, within the framework of the experimental project "Paris North Gates"[47] led by Chaire ETI and its data expert partner GFI (now Inetum) in 2019, an in-depth needs analysis study was conducted. Specific survey methods, including participatory workshops and structured interviews with various stakeholders led to the understanding and mapping out of daily activities and individual routines along the 6 social functions model. Personae or "typical user profiles" were developed to conceptualize various patterns of behaviours and needs. From these insights, variables and hypotheses were defined, which were translated into data sets.
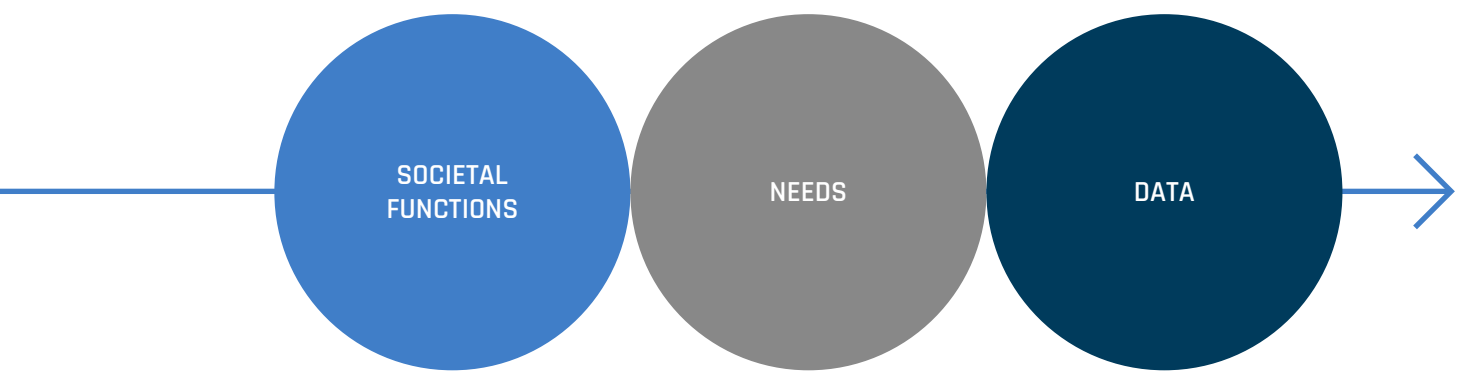


**Figure 47** Translating theory into data - Chaire ETI

This is open data, produced locally by private or public actors, and relevant for the analysis[48]. Some data held by private actors may be necessary to acquire a more detailed understanding of urban realities (e.g., transport) and constitute a challenge for partnerships.

These initial databases were reprocessed, enriched, and classified in order to obtain a list of variables for each function, which were further developed on the example of the following one (Living). It should be noted that they were not ranked in order of importance, as the weighting will be done at a later stage of the research.

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47  https://chaire-eti.org/wp-content/uploads/2019/12/White-Paper-2019.pdf page 28
48  On this point, the question of access to data for the 15-Minute City and the 30-Minute Territory experiments in foreign countries arises. The mesh network, the census, the size of the units and the publicity vary greatly from country to country.

| LIVING | |
| --- | --- |
| HOUSING | Percentage of housing benefits recipients<br>Purchase price (land value)<br>Rental (rental value)<br>Existing dwellings<br>Social housing and affordable housing |
| POLLUTION | Greenhouse gas emissions<br>Proportion of pop affected by Agenda 21<br>ATMO Air Quality Index<br>Population exposed to noise<br>ZFE (Low Emission Zone)<br>Noise pollution / Sound insulation<br>Share of dwellings not connected to a wastewater treatment system<br>Density of industrial establishments at risk (seveso) |
| ECOLOGY | Share of surface area in Natura 2000 zone<br>Renewable electricity production<br>Share of national parks in the area of the territory<br>Share of Ramsar sites (wetlands of international importance) in the area of the territory<br>Share of special protection zones (SPAs) in the territory's surface area<br>Green spaces and squares<br>Fight against heat islands |
| SECURITY | Property crime<br>Voluntary bodily harm<br>Eco and financial scams and offenses<br>Lighting<br>Security (police station, gendarmerie ...)<br>CCTV cameras |
| AMENITIES | Sunshine ("weather" / urban density / building height)<br>Local services (Laundry / Dry cleaning ...)<br>Broadband network, 4G and + |
| TRANSPORTATION ACCESS | Vélib, bicycle garage<br>Metro / tram stop<br>Station of national interest<br>Rail network (SCNF, RER, RATP, metro, tram, RER, stations, car park), rail space disused, marshalling yard, station forecourt, embankment/side, bus depot, bus station, airport, terminal, heliport, runways, port activity, car parks |
| TIME OF ACCESS | Average time of access to commonly used services closest to the home-work journey in hours peak (car)<br>Median travel time between home and work |

**Figure 48** The challenges of the "Living" function - Chaire ETI

# 4.
# DATA COLLECTION AND ANALYSIS

Data are collected and analysed at the IRIS level[49], if possible. They are then analysed and processed. At this stage, a spatialised representation is obtained and constitutes the first form of spatialisation of functions in the project area. However, this is not sufficient to illustrate the quality of life in the study area.

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49 French statistical spatial unit obtained by dividing the territory into homogeneous grids within which the population is between 1,800 and 5,000 inhabitants according to INSEE.

# II/ INDEX OF
# HIGH QUALITY OF SOCIETAL LIFE

## 1.
## CONSTRUCTION OF SUB-INDICES

We have highlighted the inadequacy of the indicators obtained in the previous stages and their processing to measure and illustrate the quality of life of a territory. In order to go further in this direction, it is necessary to construct sub-indices that will give meaning to the data collected with regard to the objectives of the 15-Minute City and the 30-Minute Territory. Indeed, these sub-indices make it possible to integrate different qualitative criteria, including proximity, into the data analysis.

Two methodologies can be used:

### Additional variables methodology:

It is a question of adding additional variables specific to each element analysed, to provide details of the participation of each element in the quality of life of the territory. Neighbourhood distance is a permanent additional variable in the analysis, with a proximity criterion ranging from 0,5 km to 2 km.

Crossing the results of these variables leads to the elaboration of a sub-index ranging from 1 to 5, which reflects the level of equipment according to the quality-of-life criteria carried by the concept of the 15-Minute City and the 30-Minute Territory [scale : entire territory, city or neighbourhood].

### Example: quality index for the distribution of school facilities in a territory

| Additional variables: | Proximity to a school<br>Sectorisation<br>Continuity of the school cycle |
|---|---|
| Sub-indices | 1 very low level of school facilities = no school facilities<br>2 low level of school facilities<br>= presence of 1 or 2 schools without continuity of education<br>3 if intermediate level of school facilities<br>= presence of 2 schools with continuity of education<br>4 if good level of school facilities<br>= presence of 2 schools with continuity of education<br>5 if very good level of school facilities<br>= presence of 4 or more schools or more with full continuity of education |

Figure 49 Qualification of sub-indices for the calculation of quality of life - Chaire ETI

## Limitation :

Limitation : the choice of the neighbourhood distance standardises the practices of the users, which could vary according to the types of profiles and according to the type of sub-index studied.

### DIFFERENT WAYS OF MEASURING DISTANCES

AS THE CROW FLIES :

DISTANCE-TIME :

**isochrone/ isodistance**
**isochrone**= measurement of the area reachable in a given time,
**isodistance** = measurement of the area reachable in a fixed distance)

For a departure from the place de Torcy, 75018 | 15 minutes travel time

Basemap :
©Map Tiler
©The OpenStreetMap Contributors
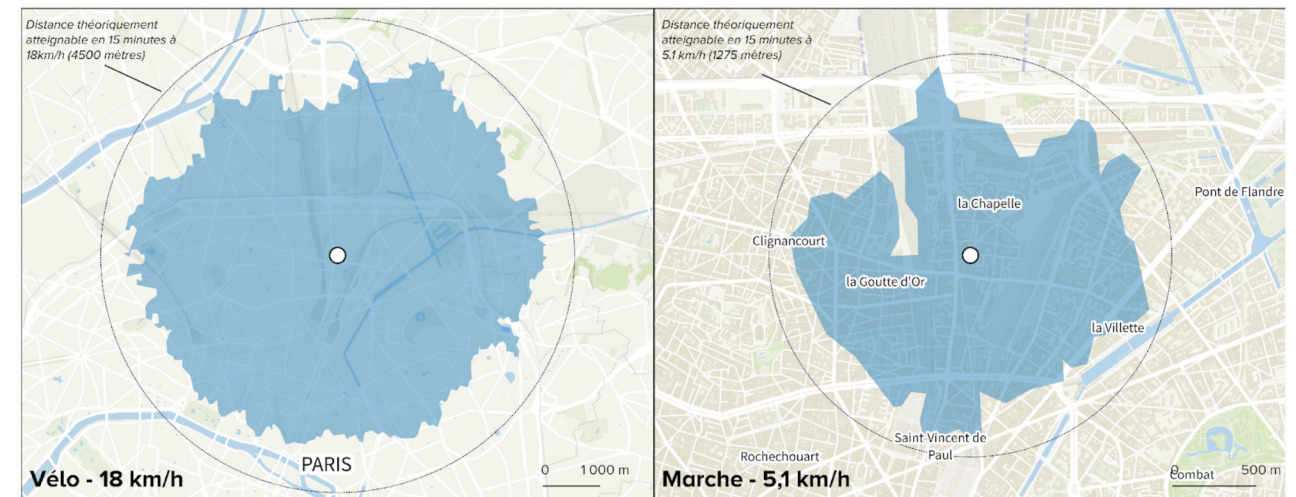


Figure 50 Comparison between isochron and equidistance - Chaire ETI

### Methodology by urban social function

This second methodological approach consists of making each societal function a sub-index in its own right, which would correspond to the sum of several sub-indices. To do this, an index is associated with each variable of a social function.

## 2.
## CONSTRUCTION OF
## THE COMPOSITE INDEX

The composite index is the one that concludes on the social quality of life of the territory, based on the sub-indices previously obtained. **It is therefore the societal quality of life indicator.**

Again, two methods are possible

### By the variables

$$Q1 = aE + bP + cV + … + … + …$$

With Q1: Societal quality of life
E: School facilities
P: Commercial potential
V: Green spaces
And so on with the other sub-indices
a, b, c, … being weighting coefficients.

This system of equations with several unknowns allows us to define the values between which each parameter [H, T, S ...] will be included. Age can also be taken into account by adding a weighting coefficient to each sub-index.

**The overall index of societal quality of life thus makes it possible to assign a value to each defined study area.**

## By urban social functions

**Q2 = iH + jT + kS + lE + mA + nD**

With : Q2: Societal quality of life
H: Living
T: Working
S: Getting supplies
E: Caring / Being healthy
A: Learning
D: Enjoying
i, j, k, l, m, n weighting coefficients

# 3.
# ASSUMPTIONS
# AND WEIGHTING

In order to calculate the index, certain assumptions must be made, starting with the prioritisation of certain social functions over others. In concrete terms, with an assumption that working, living and provisioning are of equal importance, their coefficients will be equal, i.e., i=j=k=l. If learning is considered less important, its coefficient will be lower.

**Summary of the methodology followed**
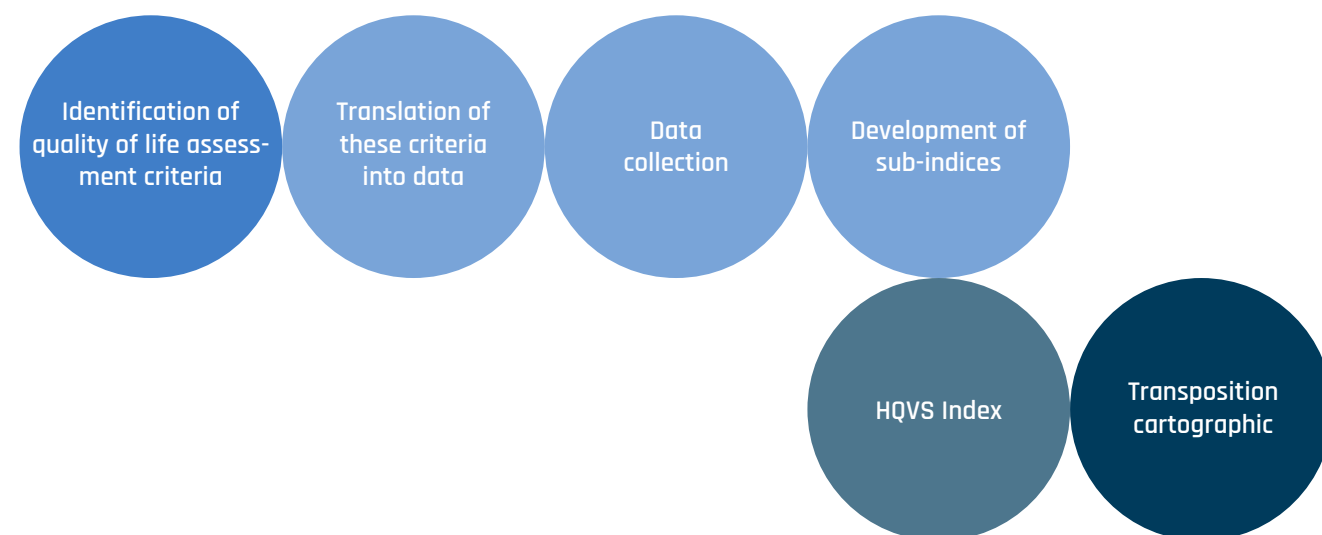


**Figure 51** Summary of the methodology followed - Chaire ETI

# III/ DIGITAL PLATFORM AND OPERATIONAL OBJECTIVES

## 1.
## SETTING UP
## A DIGITAL PLATFORM

The implementation of this methodology involves the creation of a multifunctional digital platform. Gathering data from territories and knowledge around the theme of the 15-Minute City, this platform is intended to be a tool for observing territories, correlating their service offers and needs, accessible to inhabitants and elected officials. For the latter, it is also a tool for forecasting and supporting the definition of future urban policies.

Its features are as follows:

- Blog providing access to global information on urban development projects, the 15-Minute City or the 30-Minute Territory, with a collection of opinions and comments (articles, projects, maps, news feeds, dedicated to the 15-Minute City, access to surveys and video testimonies).
- Ability to create local content in the form of an article, map, diagram, or image.
- Natural language search to retrieve content from a documentary database dedicated to territorial planning (SCOT, PLUI, PCAET, etc.).
- Search for semantic links (thanks to artificial intelligence querying the texts in the database) on multi-domain planning issues, e.g., revitalisation of town centres, pedestrianisation, etc., allowing access to sources of inspiration thanks to a documentary exploration through a graphic vision of the information.
- Taking notes and creating your own action plan by exporting data to a word processor/spreadsheet.
- Access to indicators of High Quality of Societal Life by neighbourhood, down to 100 meters by 100 meters grid analysis on the 6 key social functions of the 15-Minute City:
- Access to socio-economic and demographic *benchmark* data and the possibility to compare with other territories.
- Possibility to create a local indicator and/or to create a specific cartography that will be published in the point's blog.

# 2.
# ILLUSTRATIONS OF
# THE PLATFORM'S FUNCTIONALITIES

The platform developed for the 15-Minute City is a sophisticated geographic data-visualization, -evaluation and -simulation tool. It provides real time HQSL calculation (High Quality of Societal Life) on a given territory. It was developed as a collaboration between Chaire ETI researchers and developers from SGeVT and Inetum.

The platform includes, like most digital applications, parameter functions enabling map navigation, background selection options, and captures exports (Fig. 53 a and b)
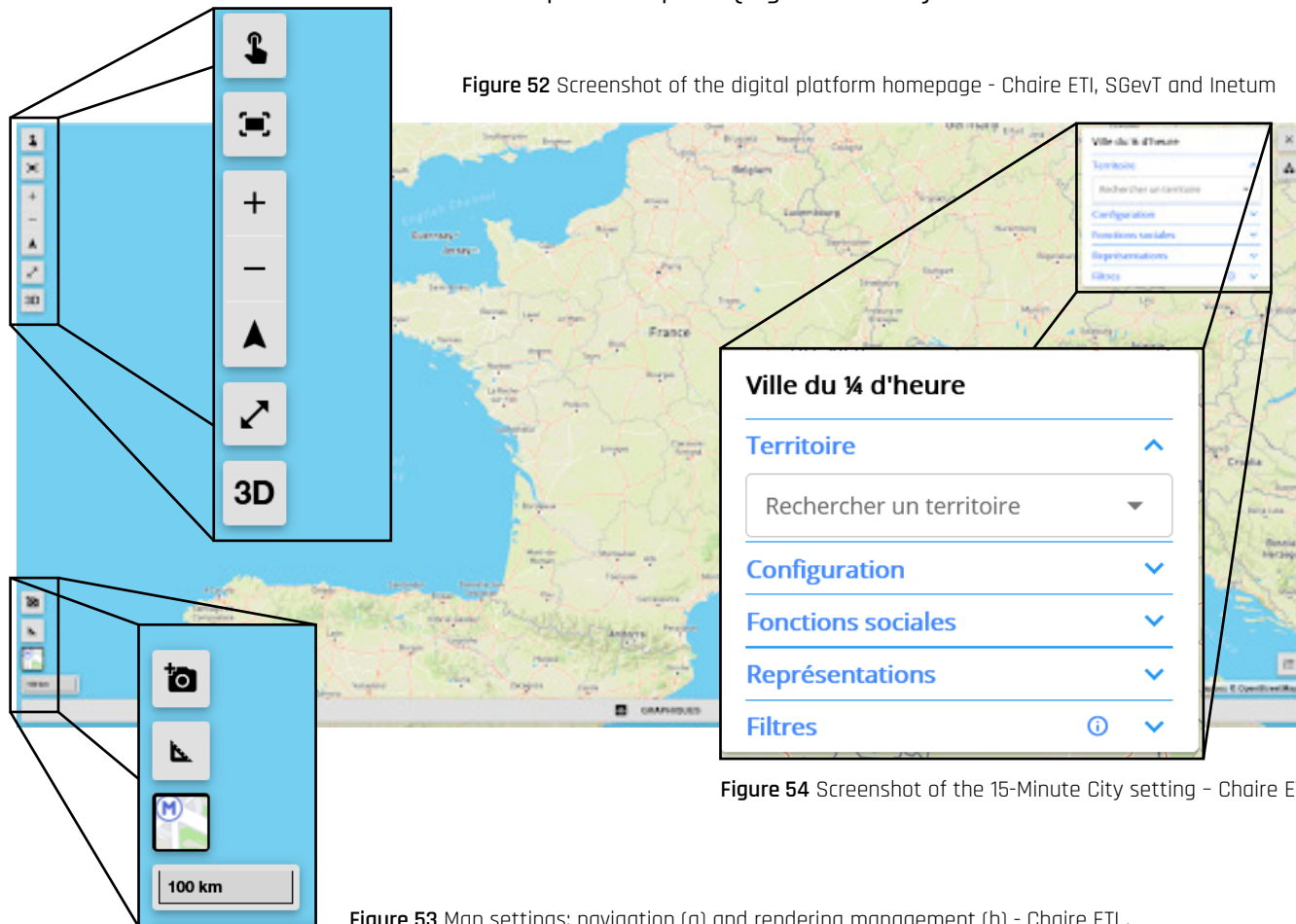
**Figure 52** Screenshot of the digital platform homepage - Chaire ETI, SGevT and Inetum



**Figure 54** Screenshot of the 15-Minute City setting – Chaire ETI

**Figure 53** Map settings: navigation (a) and rendering management (b) - Chaire ETI .

Designed for an operational approach, two elements are essential to configurate the platform (fig. 54):

- the definition of a **territory perimeter in which access times to services and amenities have been calculated.** (Fig. 55 &56)
- the **configuration of user profiles** (personae), characterized by specific daily routines (parents with young children, single adults, students, retired people) (Fig. 57 & 58)
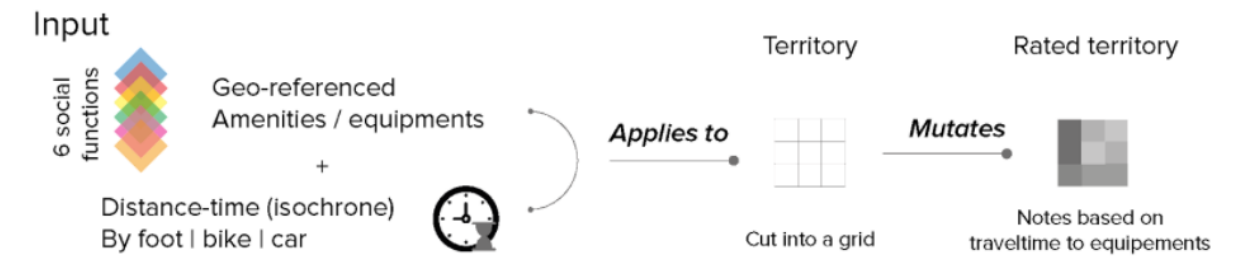


**Figure 55** Access to services, the basic measure of the platform - Chaire ETI
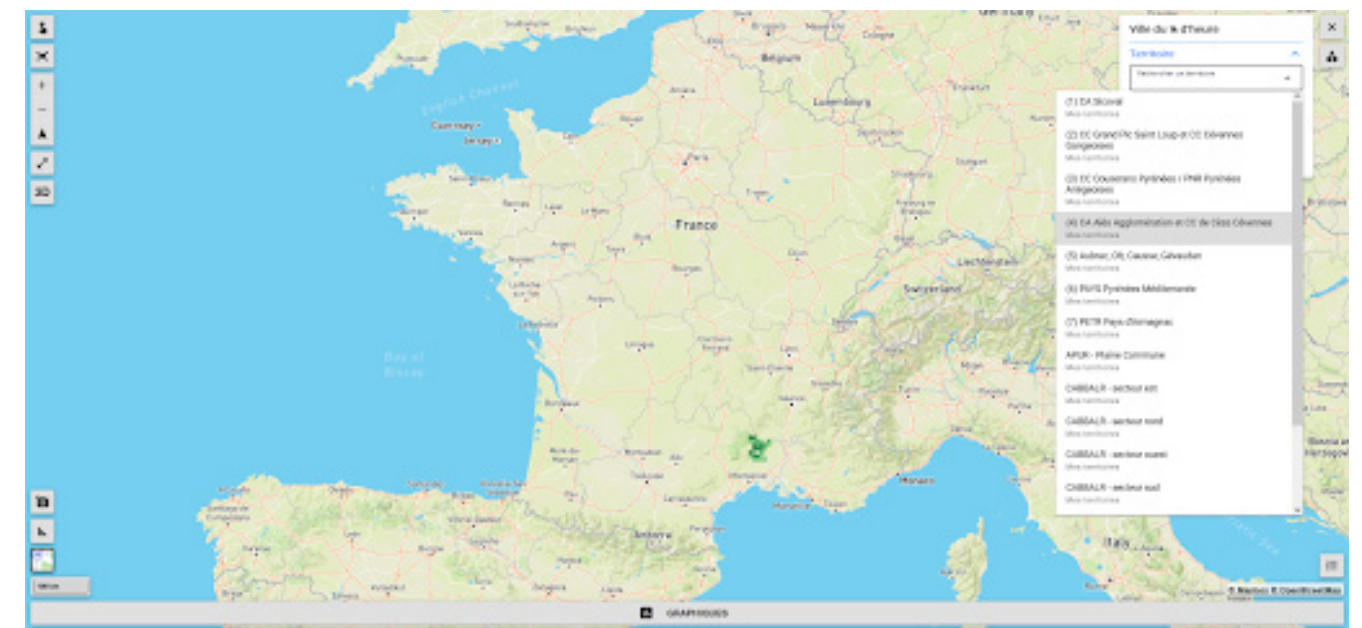


**Figure 56** The choice of a study area in the platform - Chaire ETI



**Figure 57** The selection of a personae to calculate an HQSL score - Chaire ETI
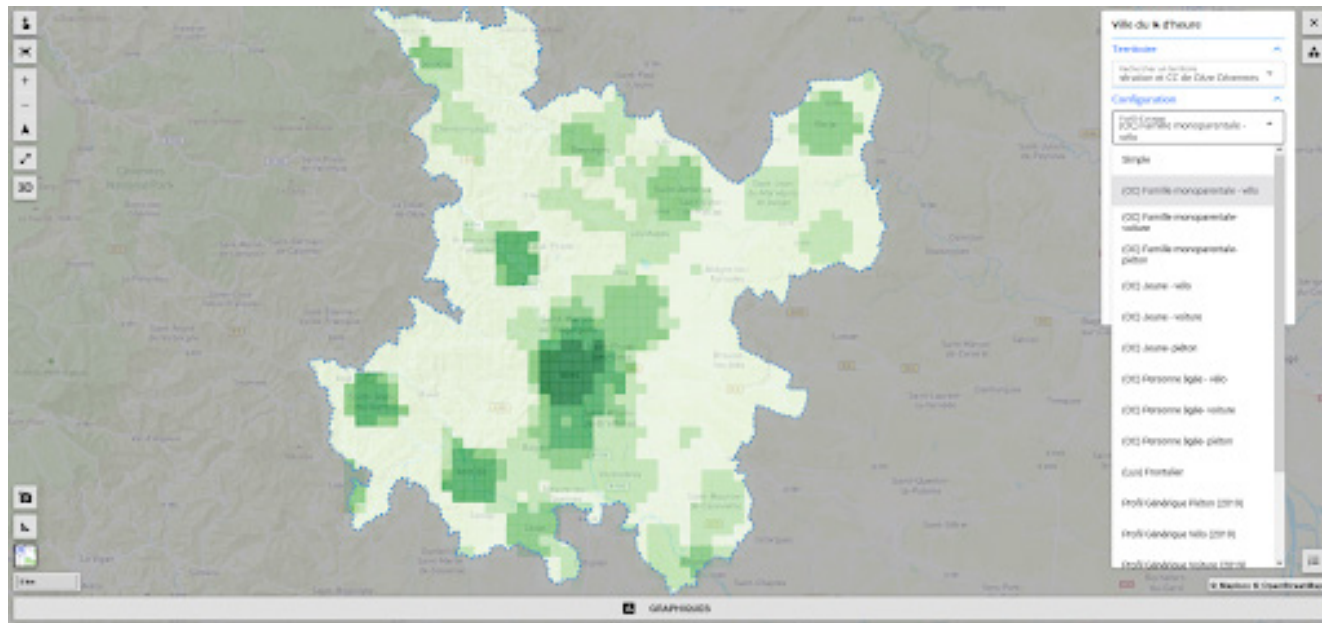
**Figure 58** The choice of a personae in the platform - Chaire ETI

The calculation of the HQSL score is based on the specific list of equipment associated with the needs of the persona.

As an example : if we consider **that an elderly person must have access to health services within 15 minutes by walking,** the areas (squares) of the territory for which pedestrian access times of less than 15 minutes have been calculated will be noted positively in the calculation of the HQSL score.

The total score is normalised after taking into account all the requirements - corresponding to equipment - of the selected profile.

In concrete terms, the platform allows the visualisation, for a chosen territory, of two elements:

- The average access time-distance for the persona's equipment (Fig. 59)
- The HQSL score of the persona (Fig. 60)
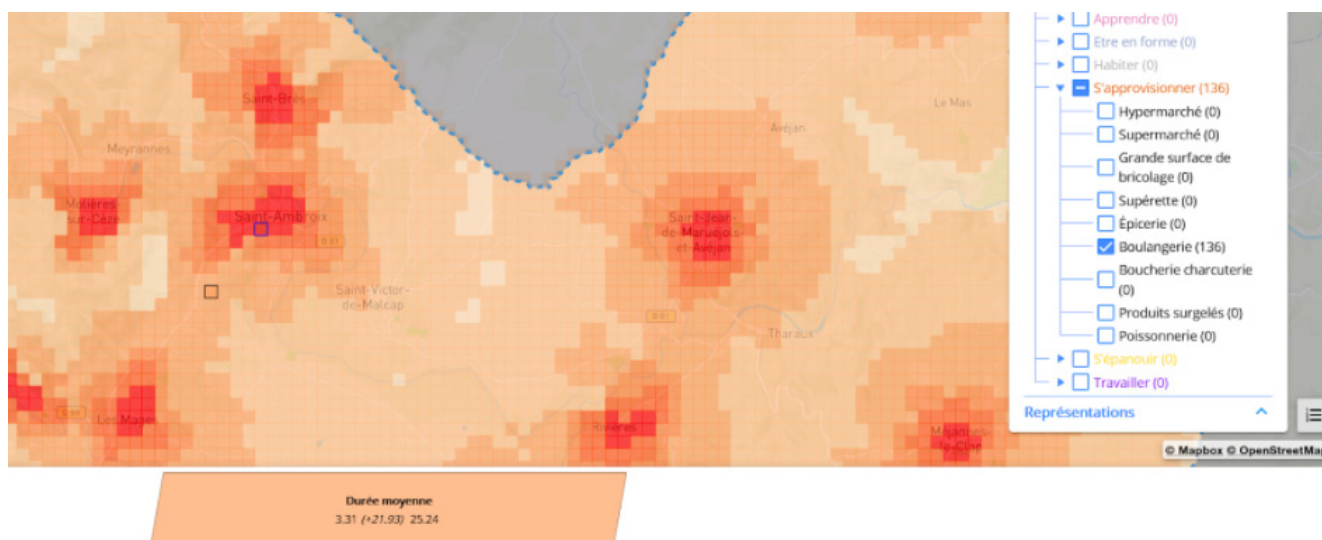


**Figure 59** Average time to access bakeries - Chaire ETI
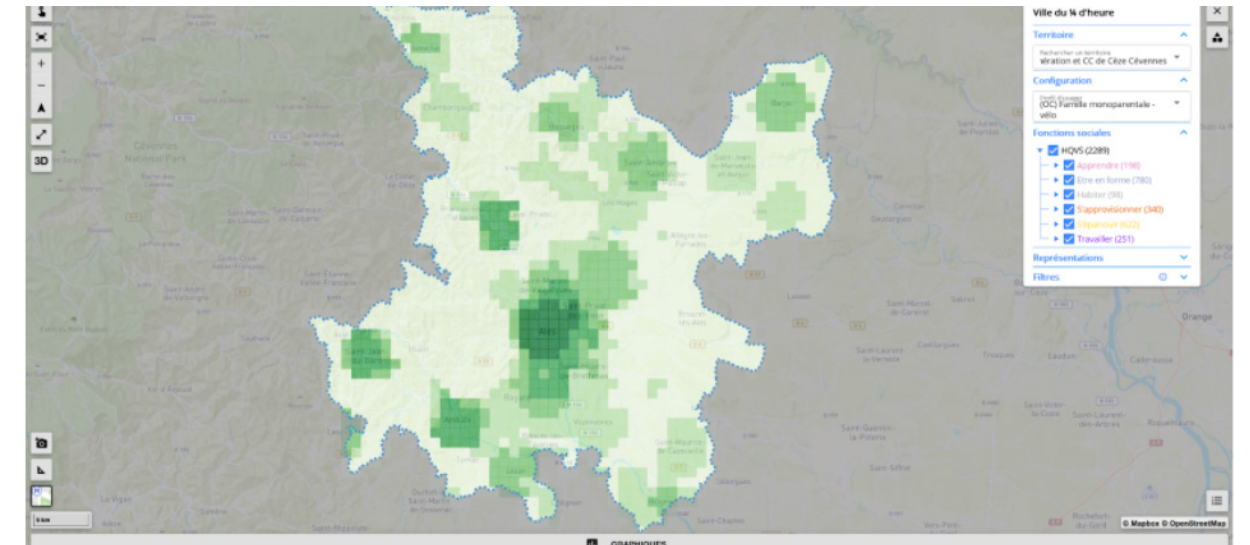


**Figure 60** HQSL score for a given persona - Chaire ETI

This *data-visualization* tool allows the exploration of the results both cartographically and in an attribute/graphical way (Fig. 61 a, b and c)
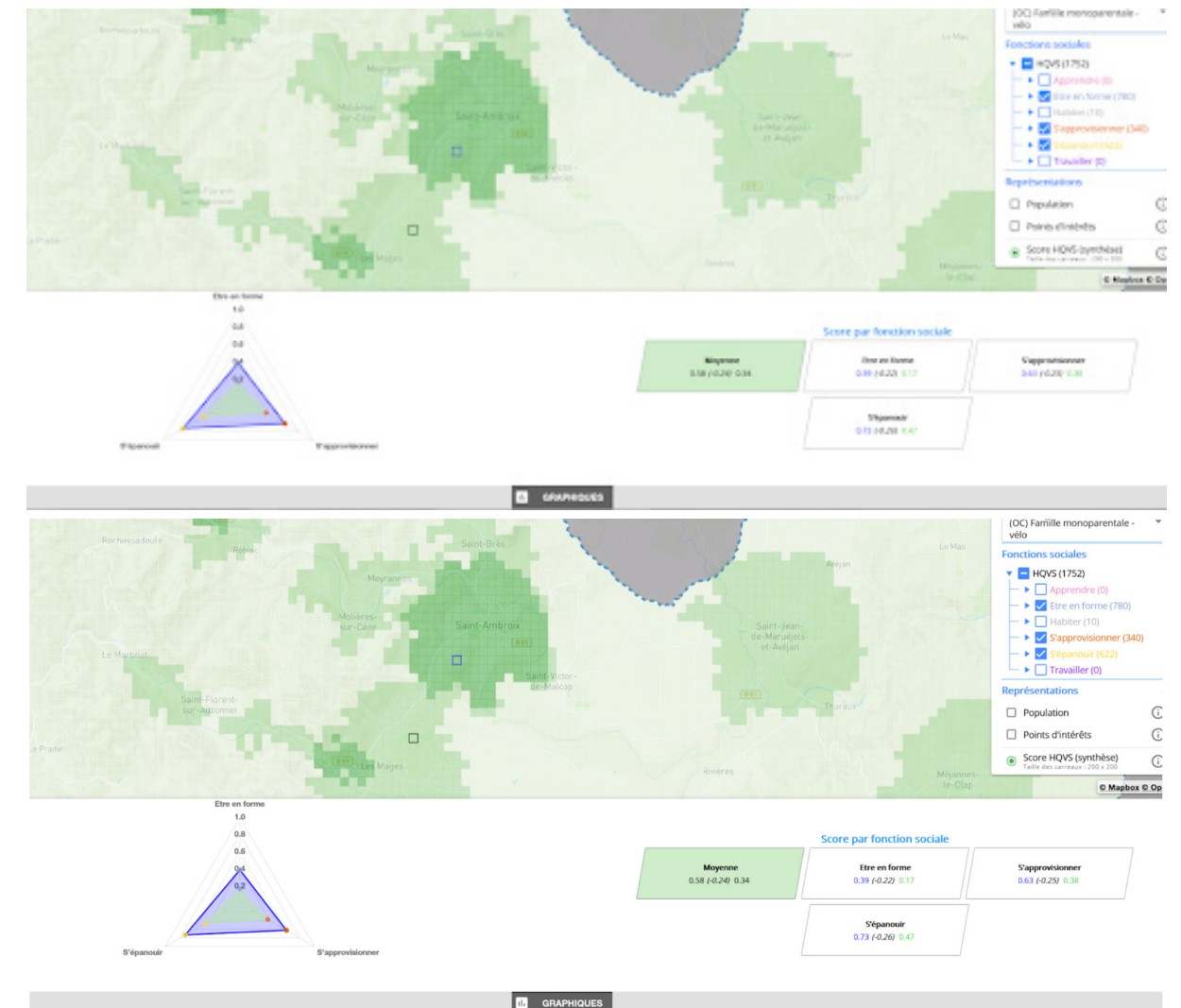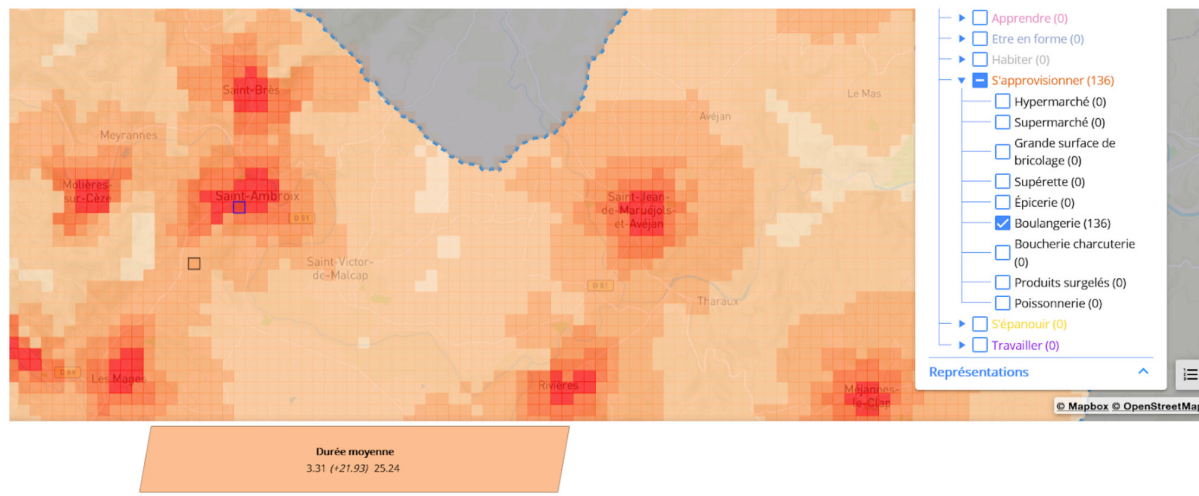
**Figure 61** Graphical and attribute exploration of the HQSL score (a), in comparison with another square (b), and the average access time (c) - Chaire ETI

The platform also offers other possibilities:

- The cartographic visualization of the specific amenities corresponding to the persona (Fig. 62 a and b)
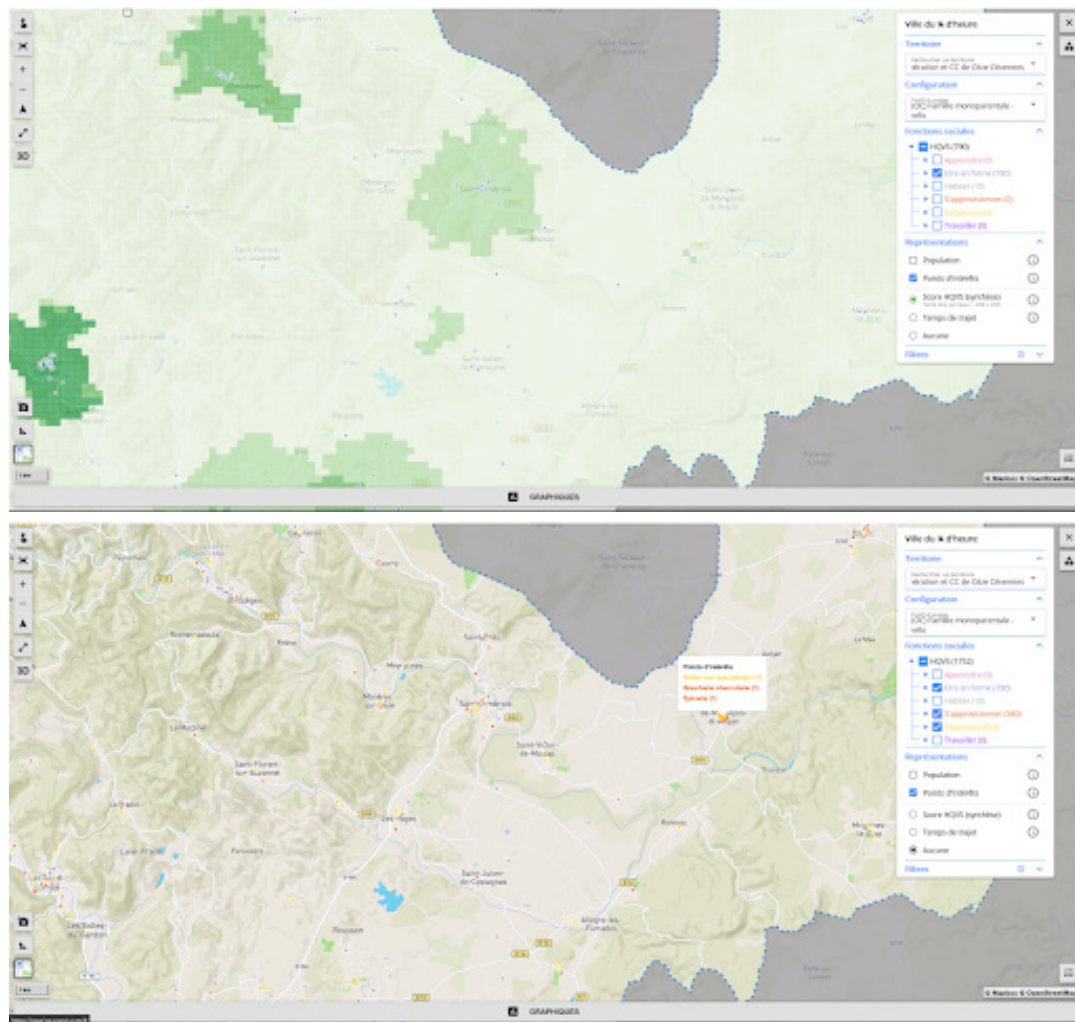


**Figure 62** Specific facilities visualised with HQSL score (a) and attribute information overview (c) - Chaire ETI

- The addition of further data on the population, for example, or of a contextual nature (Fig. 63 a, b and c)
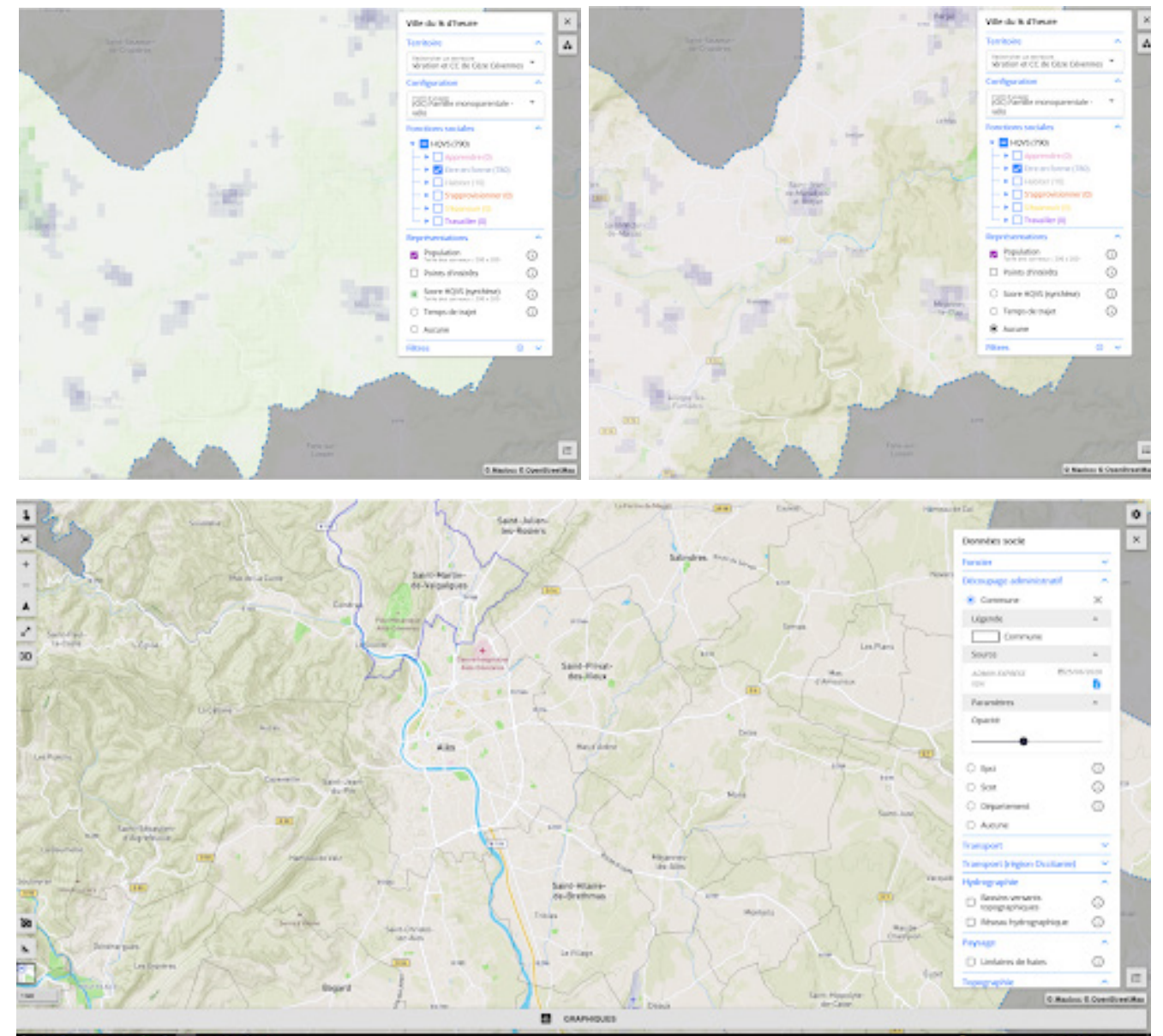


**Figure 63** Adding gridded population data (a), visualising population data alone (b), adding communal contours (c) - Chaire ETI

• Application of thematic filters: focus on specific social functions or specific amenities of these social functions. (fig. 64 a and b)

The dynamic operation of the platform allows the calculation of HQSL scores according to the selected facility.
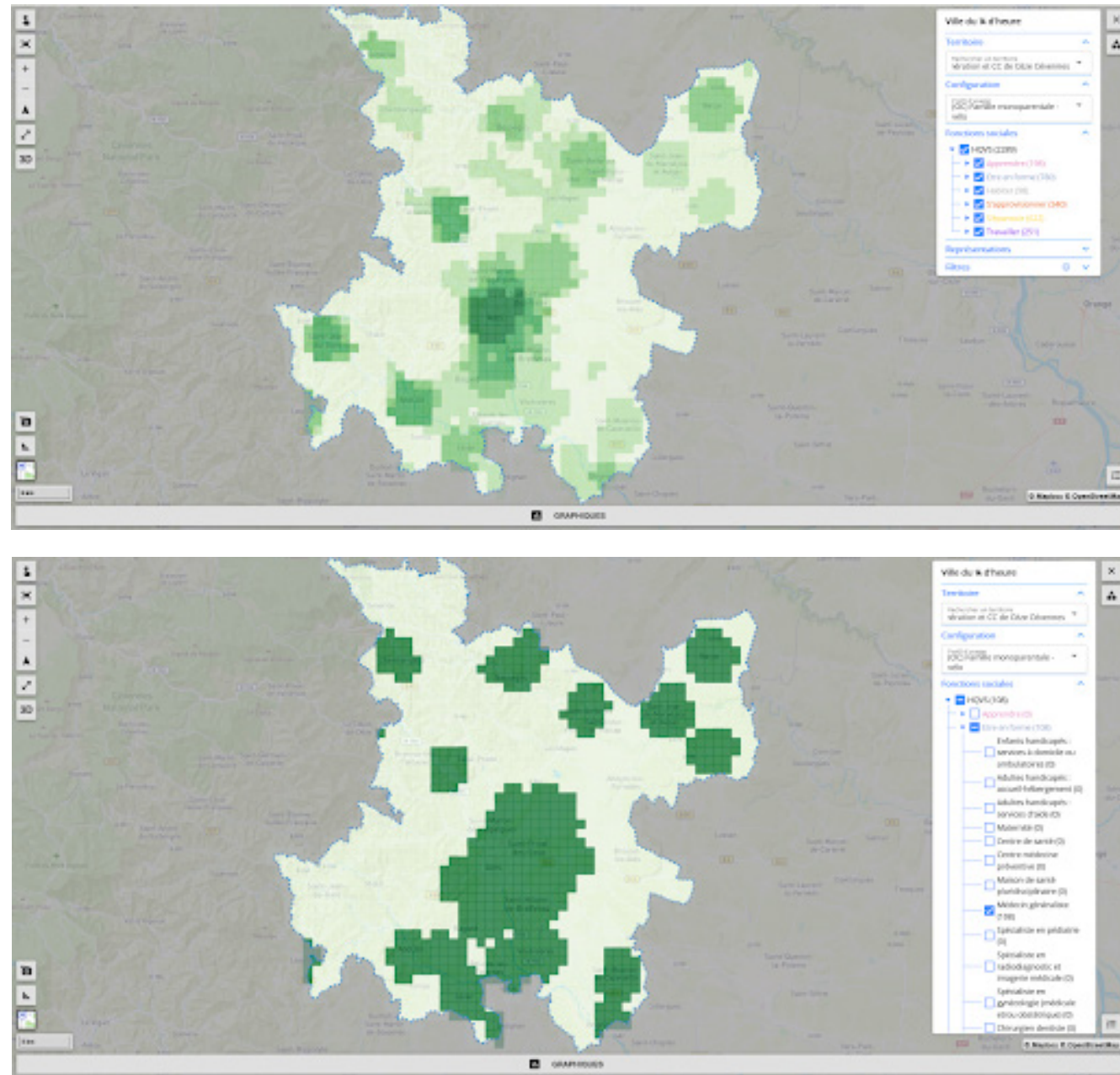




**Figure 64** Overall HQSL score for a selected personae (a) and as a function of the distance-time to access general practitioners only (b) - Chaire ETI

• Statistical filters: display of a fringe of the territory that is more or less populated, with a more or less good HQSL score (fig. 65 a b and c)
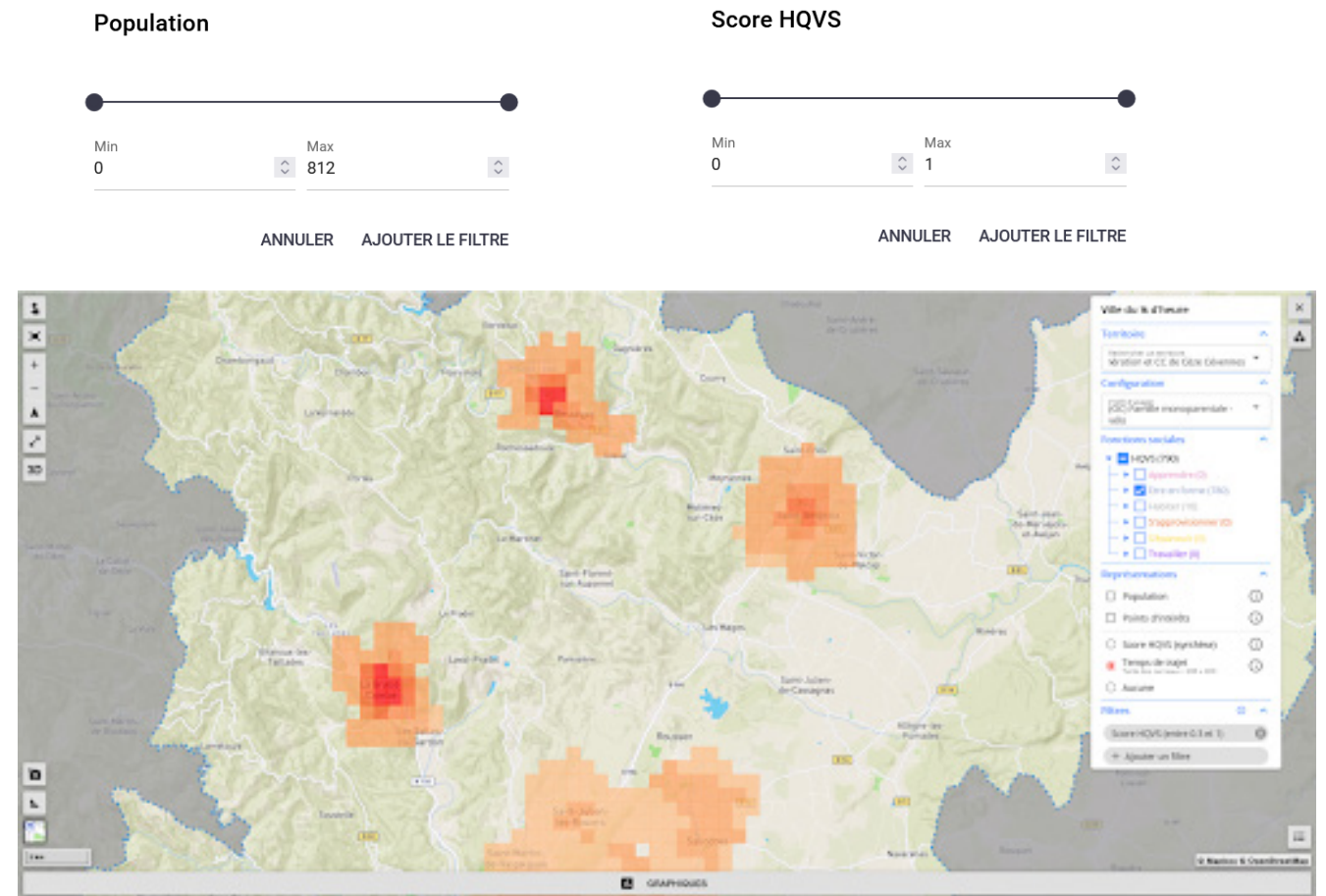




**Figure 65** a, b and c. Application of filters based on population (a) or HQSL score (b) and map filtering (c) - Chaire ETI

# 3.
## STUDY CASE EXAMPLE

We have applied the HQSL methodology in France to study a large agglomeration community characterized by a network of small size cities without a main centrality. This area would be considered a "30-minute territory" but the interesting part of the study is to analyse a low population density zone.

Proximity studies tend to concentrate on large, dense, and urbanized areas. With this project we have an opportunity to research the dimensions of High Quality of Societal life at a territorial scale in which density ranges from 40 inhabitants /km2 to 2,500 inhabitants/km² depending on the commune.

In this wide agglomeration community, the use of and dependency to individual cars is very high. Therefore for the specific purpose of this project a seventh urban function was added to the HQSL initial ontology: mobility.

Our methodology was first implemented to evaluate the accessibility levels to various **services and amenities**. Three categories of services were identified defining the concept of a "portfolio of services".

- **Local services**: essential to everyday life for most people
- **Intermediate services**: used less regularly by most people
- **Centrality services**: strategic amenities and infrastructure to be shared within the territory

**Regrouping facilities in portofolios**
Considering three levels of proximity

**Analysing HQSL scores of each portofolios**
thanks to the platform
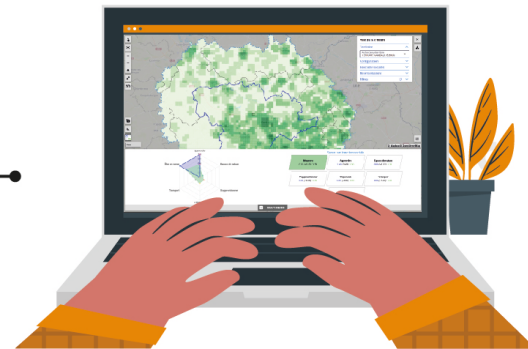
**Figure 66** Methodology of the portfolio of services approach - Chaire ETI

These three levels shown in Fig. 66, classified according to their level of proximity, are a prism of analysis that is superimposed on the ontology of the seven social functions.

The logic of portfolio of services can be illustrated by studying the proximity amenities (fig. 55).
The social function "living" usually includes mobility related equipment data, with the creation of the seventh social function "mobility", the services categorization was adapted. We were able to enrich the default data set of our digital platform (Banque Permanente des Equipements provided by the French statistical Bureau) with complementary geographical data sets shared by the local urban planning team.
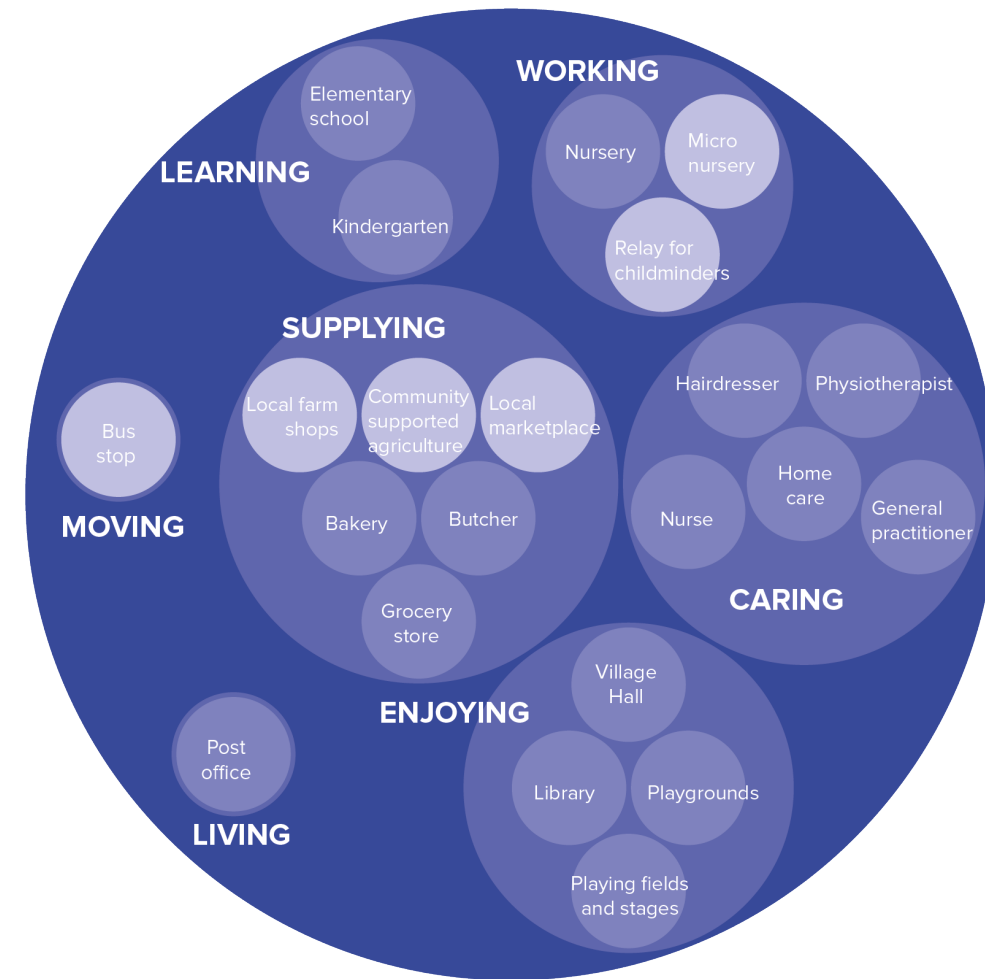


**Figure 67** Services categorization of the "proximity" portfolio of services. A distinction is made between data sourced from the Banque Permanent des Equipements and data originated from other sources - Chaire ETI

A simple mapping of amenities within all levels (Fig. 68) highlights the spatial concentrations within the different urban centres of the agglomeration community. However, relationships between social functions nor real accessibility ranges are not visible.

**Mapping of facilities from the three levels of portofolios of services**
*Facilities from the BPE 2020 (Insee)* ● *and from other producers (agglomeration community and OpenStreetMap)* ●
Basemap : ©Map Tiler | ©OpenStreetMap Contributors



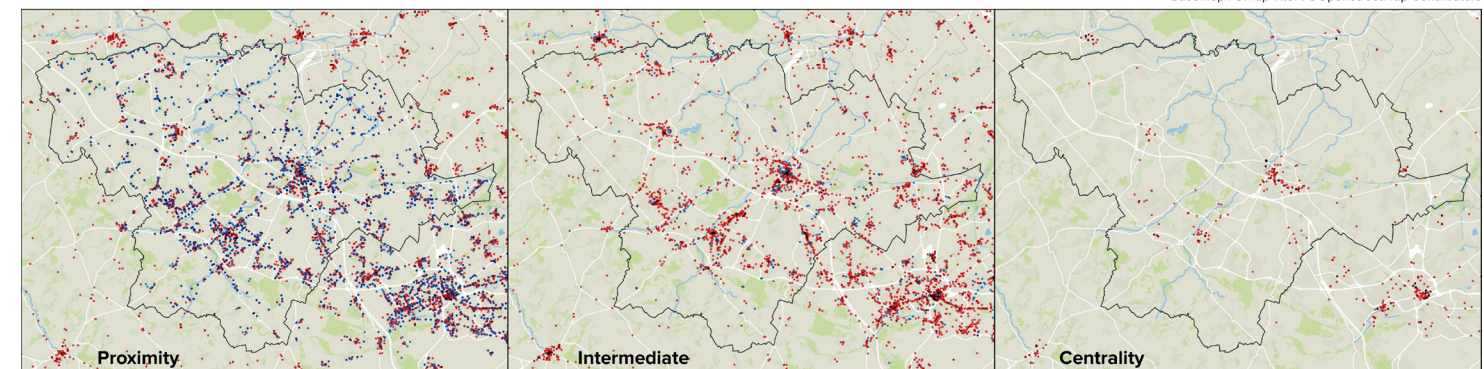Proximity    Intermediate    Centrality

**Figure 68** Mapping of the three proximity levels of the portfolio of services - Chaire ETI

For this particular project, the patterns of behaviours related to proximity were not considered at user level but at the sub-level of the portfolio of services. In order to calculate and compare the HQSL score it was decided that each of the 3 service levels would be considered as a "profile".

The allocation of distance-time thresholds to reach the equipment for each profile were set as follows:

- A local equipment should be reached within 15 minutes walking distance.
- An intermediate equipment should be reached within 15 minutes by car.
- A centrality equipment should be reached within 30 minutes by car.

We have already mentioned the situation of individual car dominance in this project. The objective here is to carry out a diagnosis of the logic of portfolio of services with three sub-levels, as reflected in the current main transportation mode. This explains the measurement of HQSL scores with thresholds of distance-time by car for the intermediate and centrality levels.

Here are the results of this first mapping exercise:
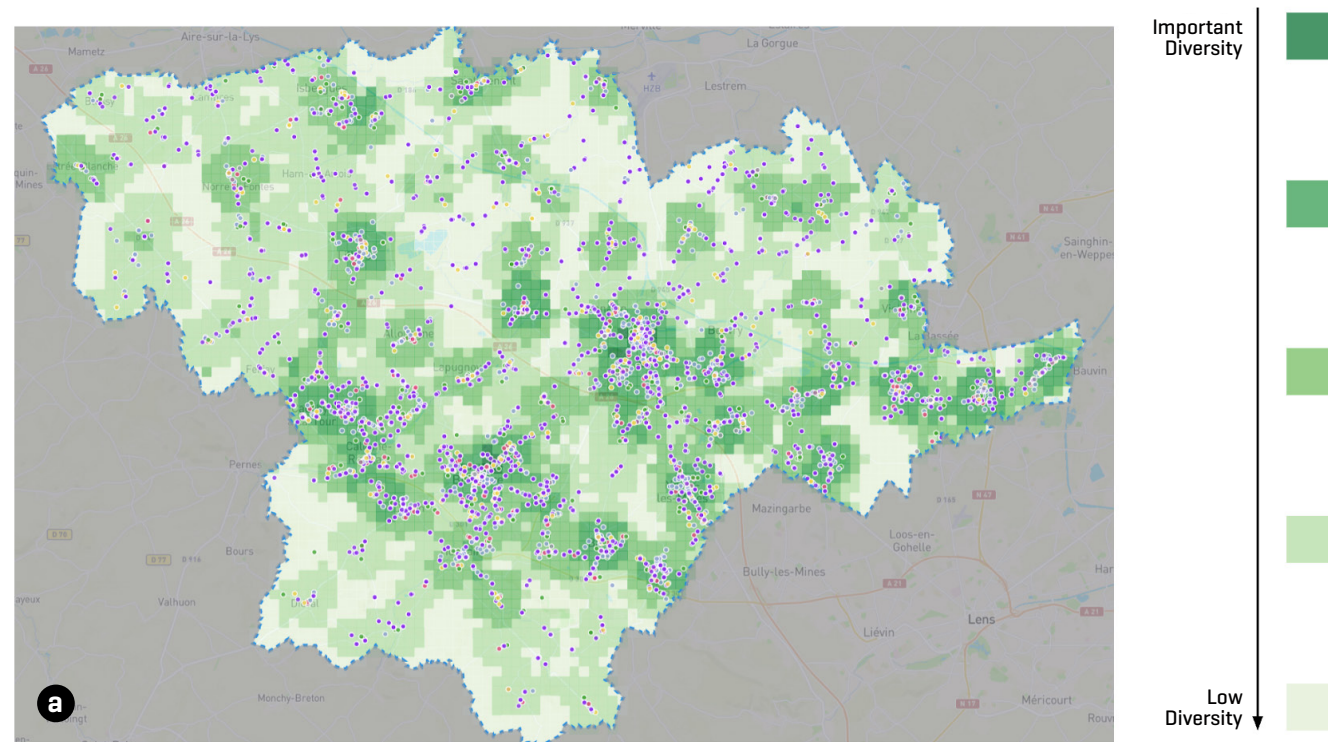
**Figure 69** Portfolio of services Analysis I HQSL (High Quality of Societal Life) scores for the proximity level - classic representation (a) and displaying only populated areas (b) - the intermediate level (c) and the upper level (d) - Chaire ETI

High level findings: in general, the territory is well covered by various amenities with different levels of accessibility. We observe (a) a low walking accessibility score (within 15 minutes) to local (basic) services in inhabited areas (b). The lowest results for the services diversity score are indeed to be find in areas without settlement.
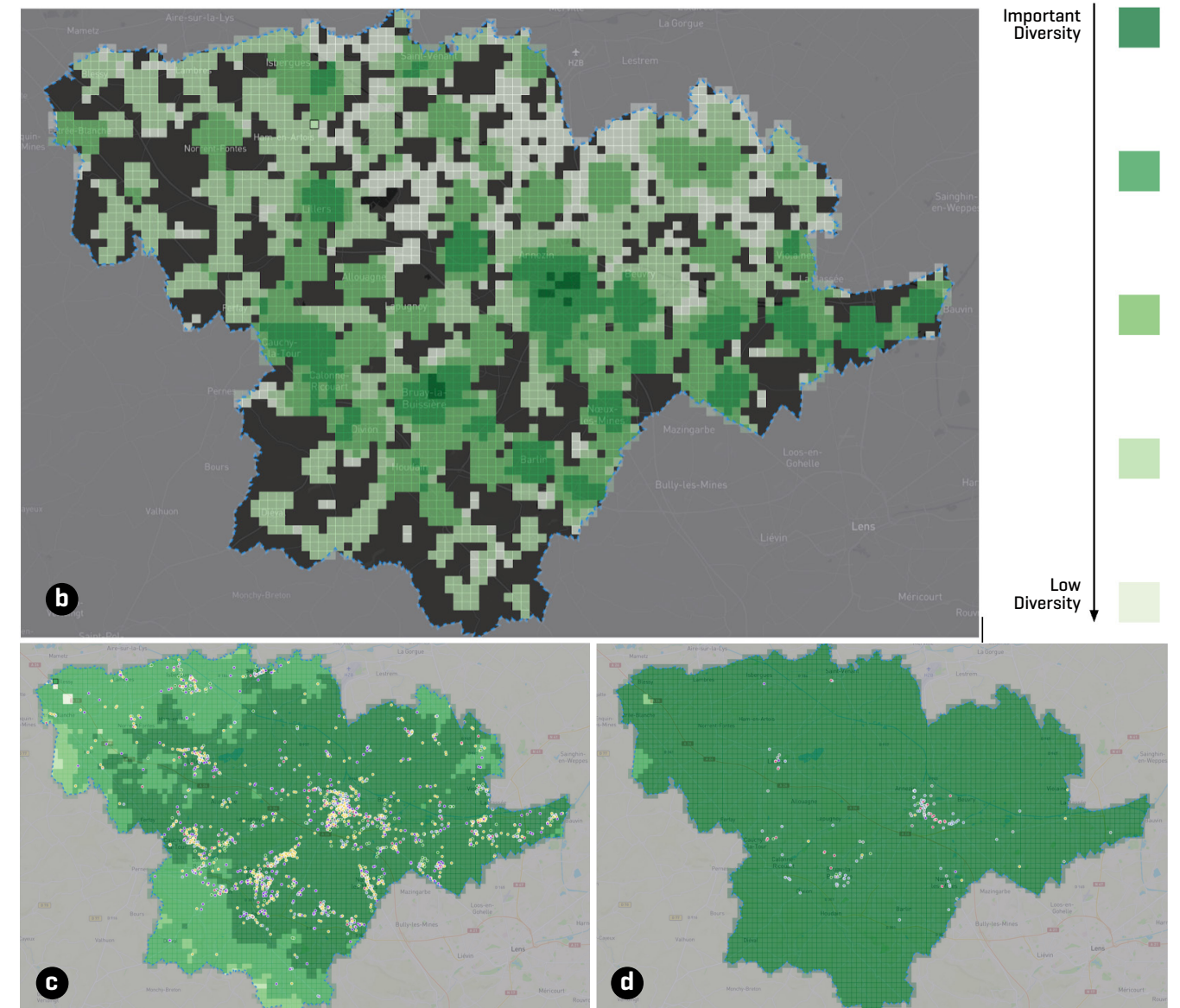
Figures (c) and (d) show the car reach potential to all intermediate and centrality services in 15 and 30 minutes respectively. The roads network and infrastructure are enabling this well-functioning accessibility coverage thanks to a highway (A26). The city of Bethune does however concentrate some centrality functions (administrative, cultural, transportation).

As a result to the project insights generated with the HQVS methodology, the local authorities, together with their urban planning teams and Chaire ETI have started to make decisions to improve access for each level of the portfolio of services:

- Local services: redefining the amenities to complement the current offer.
- Intermediate services: encourage access via active mobility (walking, cycling), shared and public transportation.
- Centrality services : maintain the offer and explore hybrid access modalities

To achieve this, the idea is not to create and build new amenities to fill the gaps, but rather, based on this work, to leverage three complementary means of action:

- **Services mutualisation (chronotopia)** : the idea here is to optimise what already exists by leveraging assets value with new functions. This can be done by developing multi-use centres (housing, retail, workplaces, schools, restaurants, ...), encouraging local and short circuit commerce (Figure 68) or by extending the operating hours of an equipment (opening schools on week-end for other use cases etc ...).

  For example, Figure 68 (data source: CABBALR) shows the role played by local organic farms as only food provider in certain parts of the territory.
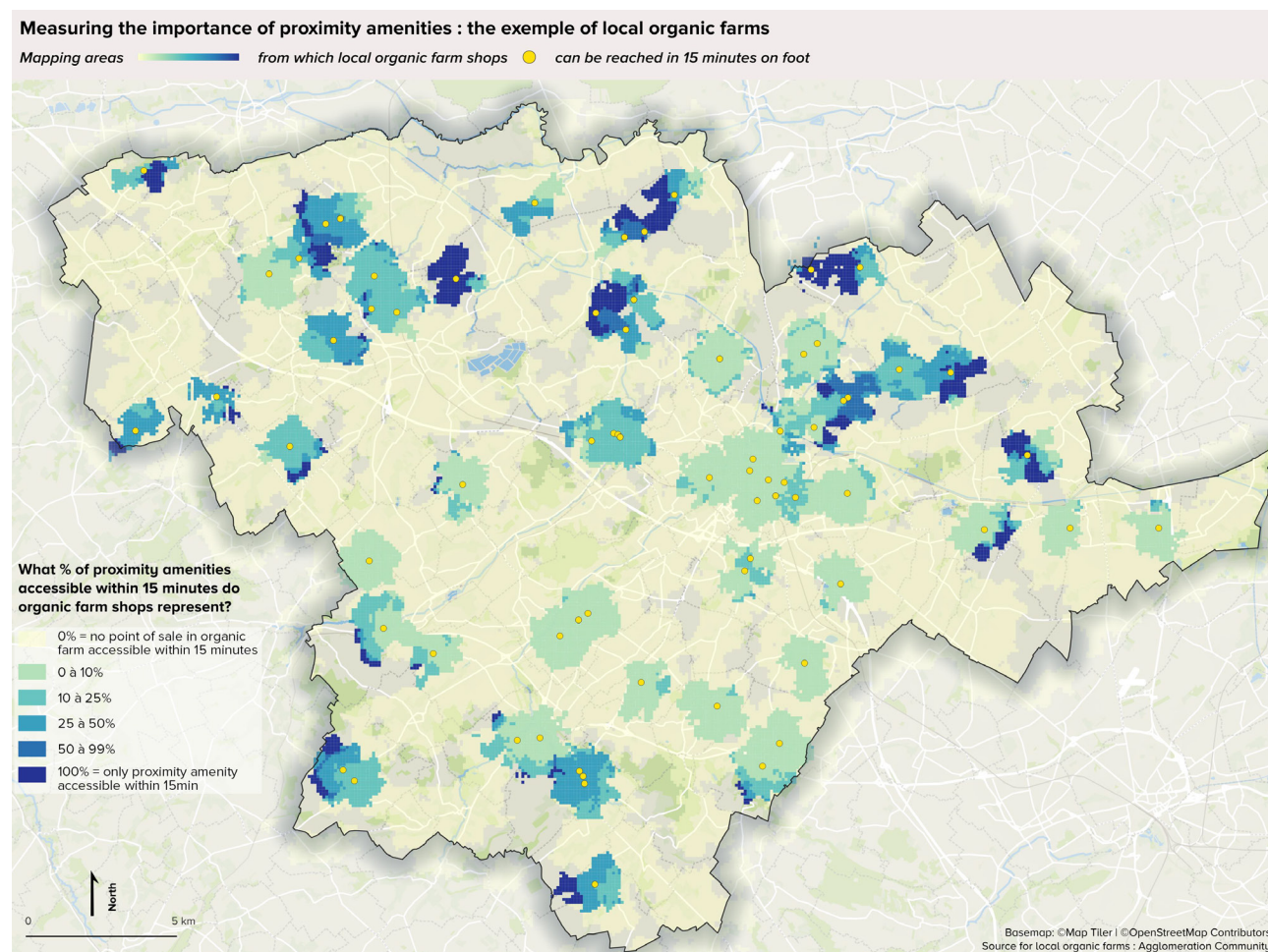


**Figure 70** Local organic farms distribution amongst other activities - Chaire ETI

- **Hybridization** (ubiquitous use) : the idea is to combine in person and online access to certain activities (classes, work, administrative request, medical check, e-commerce ...) to allow people
- to choose their mobility patterns but also to connect remote inhabitants or those with mobility difficulty.

- **Shift to alternative mobilities**. The idea is to promote active (health benefits), decarbonated and collective transportation solutions whenever possible.
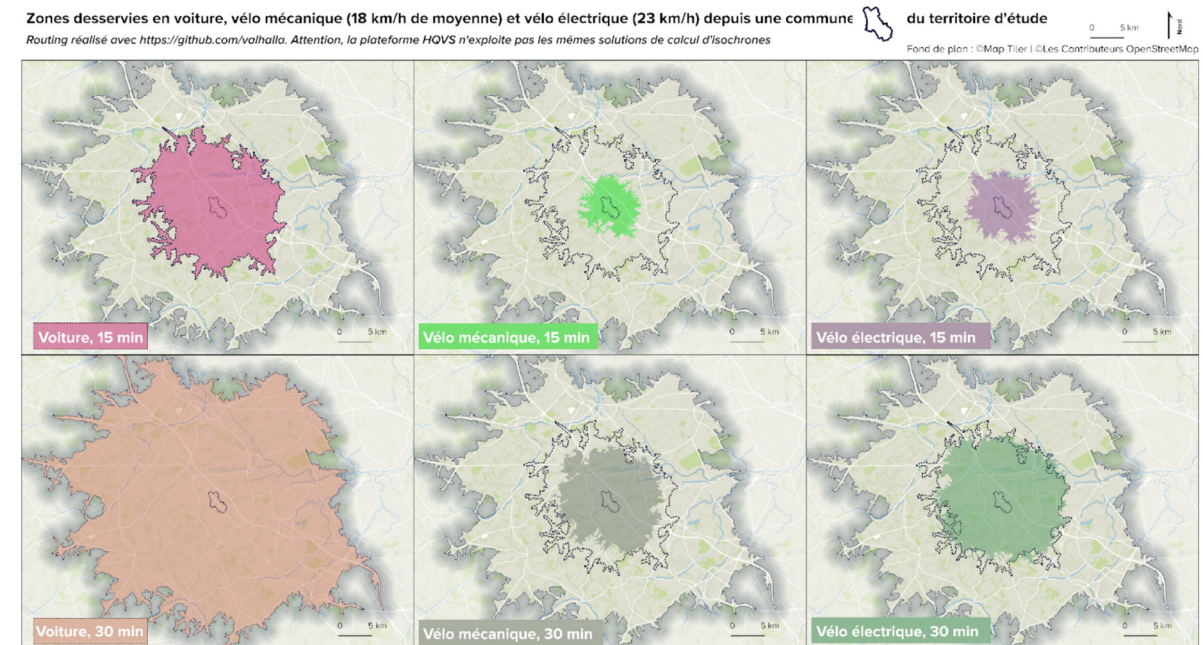


**Figure 71** Comparison of areas served by car, mechanical and electric bicycles from a municipality in the west of the agglomeration community - Chaire ETI

As this project illustrates, the HQSL geo-visualization platform offers a complete reading of the issues related to the proximity and accessibility to services in a territory. It can be enriched by additional geographical data (which are integrated into the HQSL platform and analysis) or by other spatial or geo-statistical analysis tools.

# PART 3:
# COMMUNITY MEMBERS AND
# CITY LEADERS TO EMBRACE CHANGE

**As mentioned earlier, an urban or territorial quality of life diagnosis needs qualitative and sensitive inputs from users, residents, and key stakeholders to be fully representative of the "perceived" reality.**

In parallel to the HQVS digital platform development, a toolbox of content and material aiming at engaging people was developed in collaboration with the City Lab of Ecole de Design Nantes Atlantique. It is called **"Proximities Fresk workshop".** This approach which enables to cope with people perceptions is crucial, and opens a new research agenda, in order to better apprehend quality of social life.
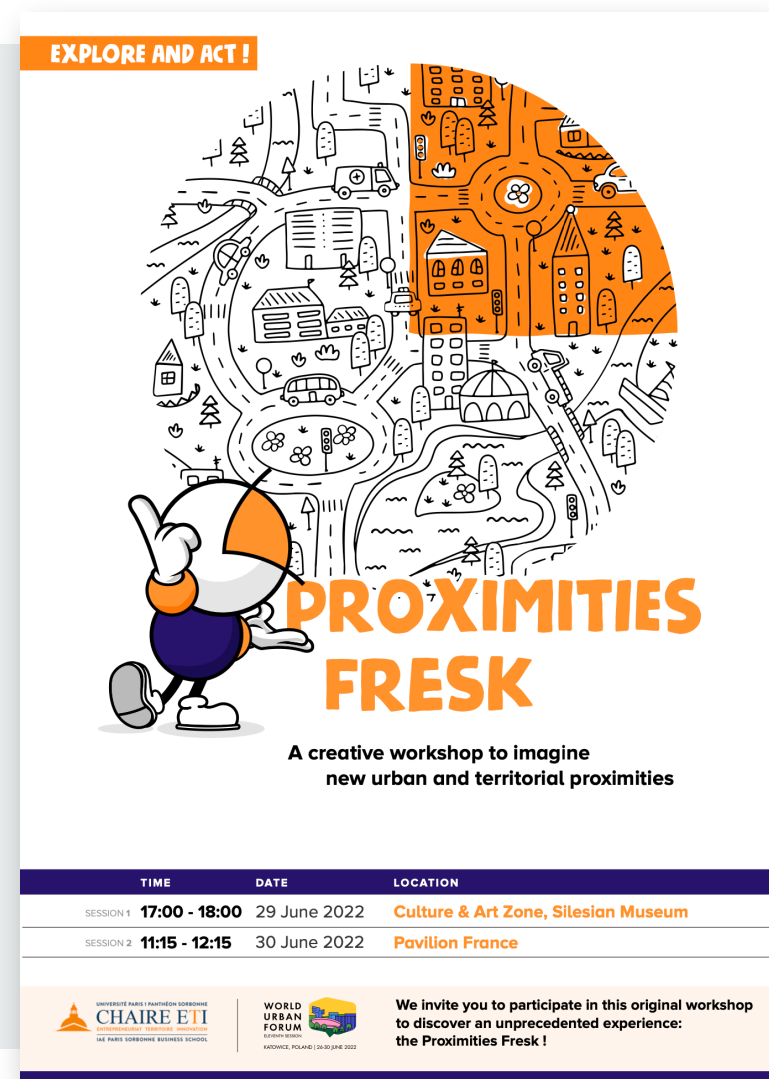


Figure 72 Proximities Workshop poster from the World Urban Forum (WUF11) in Katowice, Poland (June 2022)

This format is inspired by the other "Fresks" designed by passionate scientists (from the Shift Project and other laboratories) to disseminate complex findings about the environmental crisis we are facing (Fresk of - Climate, - Biodiversity, - Mobility, - City etc ..)..
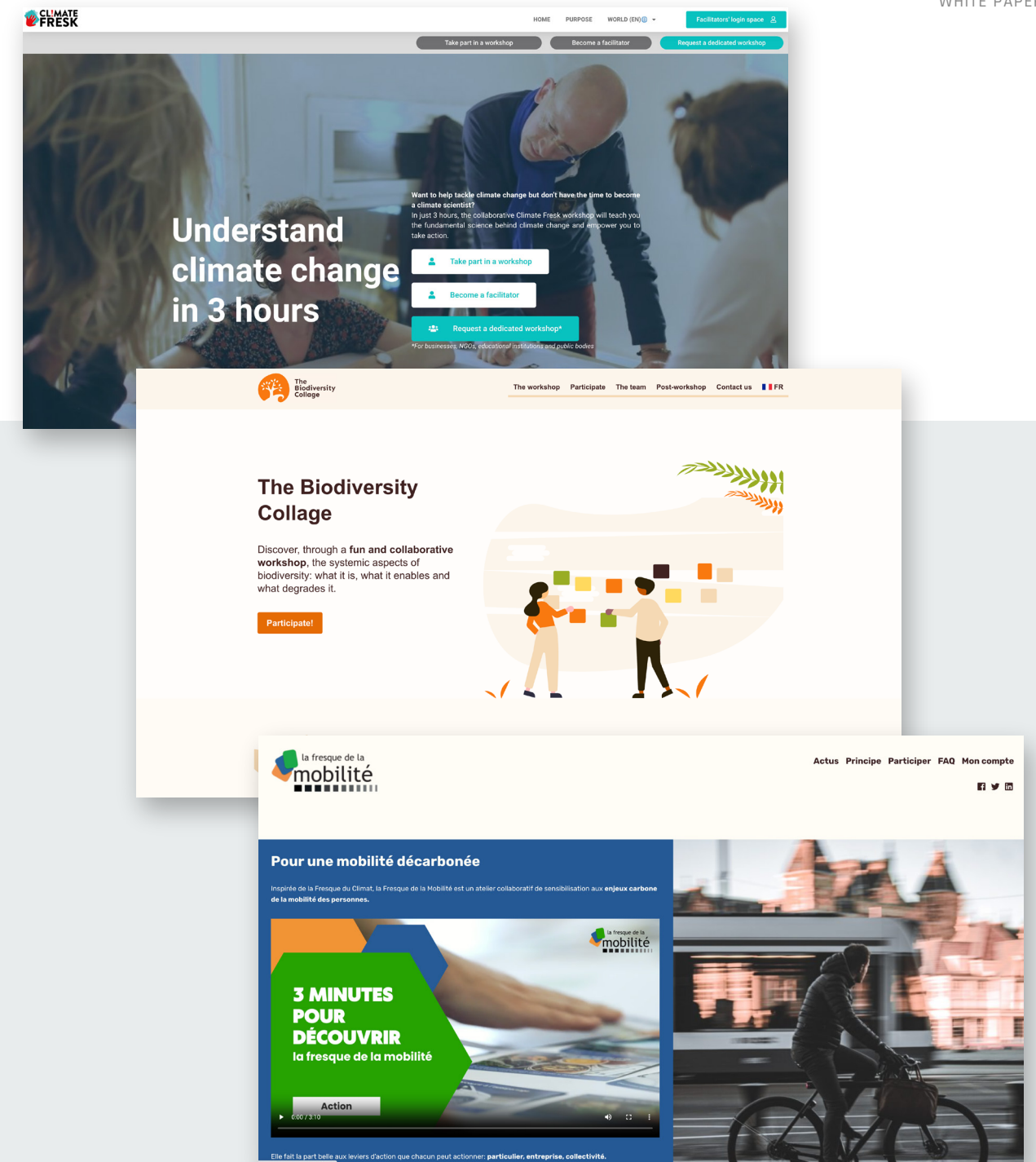


Figure 73 Visuals from Climate Fresk, Biodiversity Fresk, Mobility Fresk ....

It is **an engagement tool** to help people **self-reflect on their daily routines** and the spatial and temporal dimensions of their lifestyles at a city, territory, or neighbourhood scale. Participants are invited either **to use fictitious personae** or **to share and map their personal weekly activities** on a canvas structured around the six social functions (organised by distance to their home, transportation mode and frequency).

It is also an **empowerment tool** to trigger their **desire and motivation to transform** some of their living habits (usually built over time and not fully conscientized) or practices if they are decision makers or stakeholders of the city community (urban planners, elected responsible, private actors).

Objectives of the Proximities workshop:

- Understand the conceptual framework of urban and territorial proximities with our model of six social functions and High Quality of Societal Life score
- Self-reflect on the importance of living in proximities by connecting – daily routines and the three HQSL dimensions : well-being, socialization, environmental impact
- Identify the pain points and challenges of lifestyle changes for various profiles and stakeholders
- Imagine new life "scenarii" for themselves or their fictitious personae by applying concrete means of actions (community building, digitalization, alternative mobility strategy)
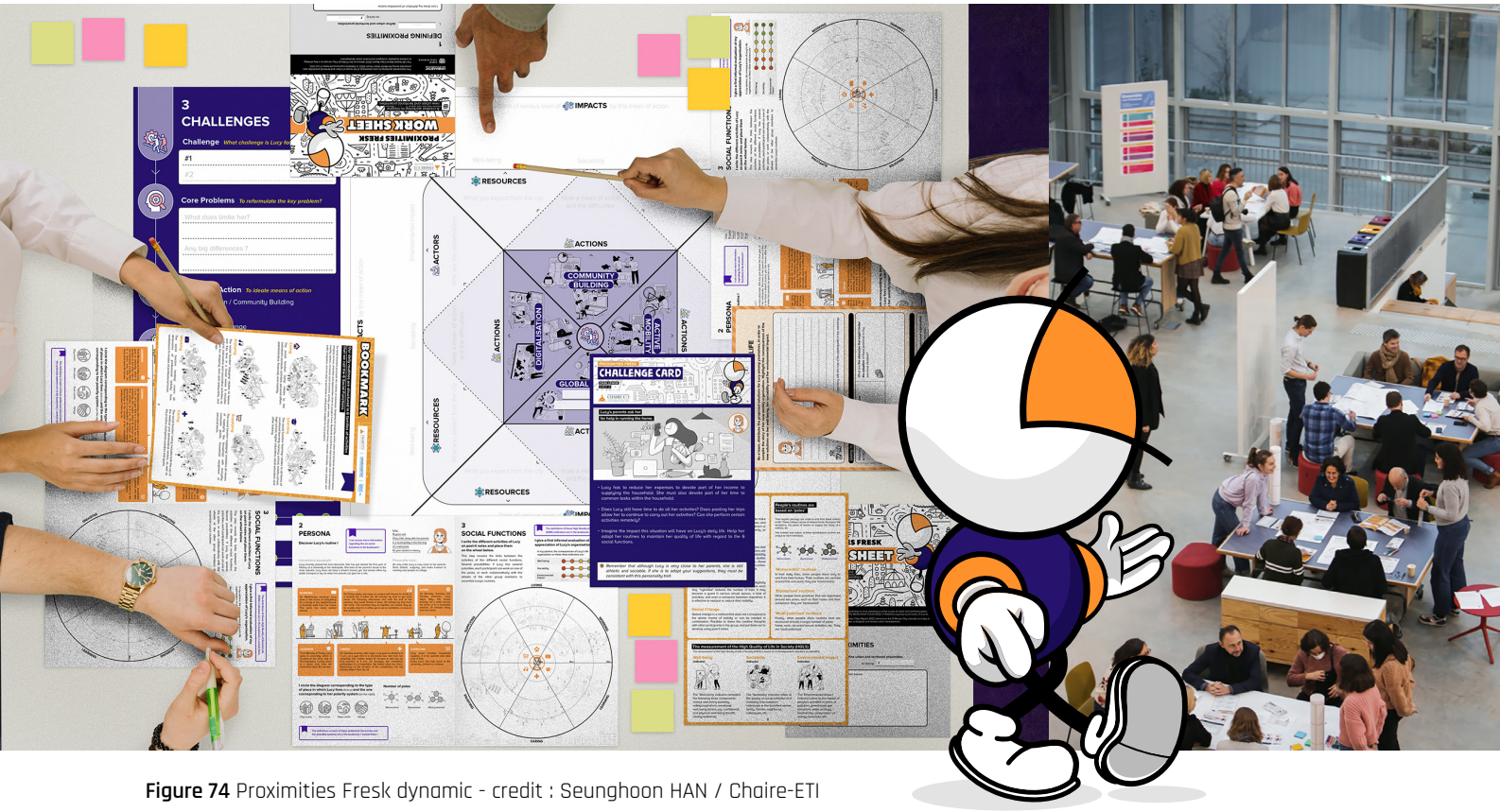
Figure 74 Proximities Fresk dynamic - credit : Seunghoon HAN / Chaire-ETI

This workshop is the first open-source tool of a series of global material that Chaire ETI researchers are designing to support the growing worldwide community of project leaders, academics, city residents and leaders who want to implement the pillars of "urban proximities". Over the past 2 years we have led workshops in multiple countries, languages and projects contexts (to collect users input or to align stakeholders). Reach out to us if you want more information.

**INTRODUCTION OF THE WORKSHOP PROXIMITIES FRESK**

| 1 | 6 | 1 | 3 | 1 |
|---|---|---|---|---|
| Persona | Social Functions | Challenge | Evaluation Criteria | Persona's New Story |
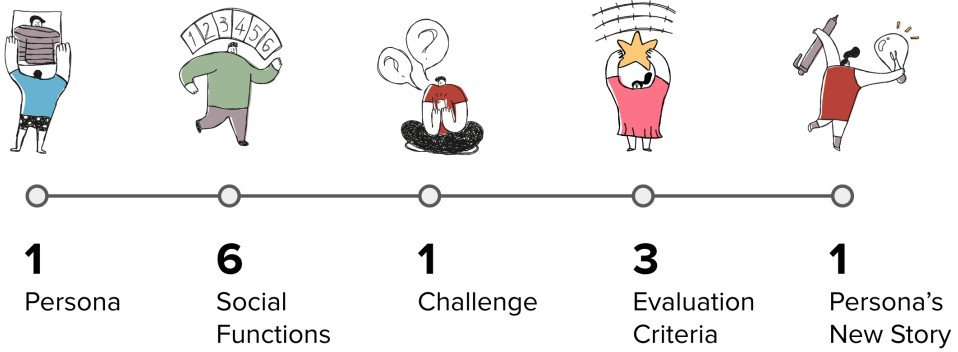
## Workshop supports

a fun and collaborative workshop to discover the dimensions of proximities

CHAIRE ETI
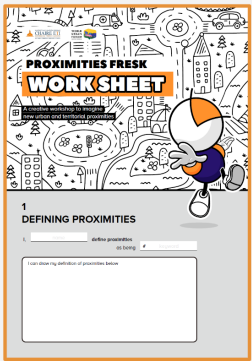UNIVERSITÉ PARIS I PANTHÉON SORBONNE
IAE PARIS SORBONNE BUSINESS SCHOOL

Group of 4 people

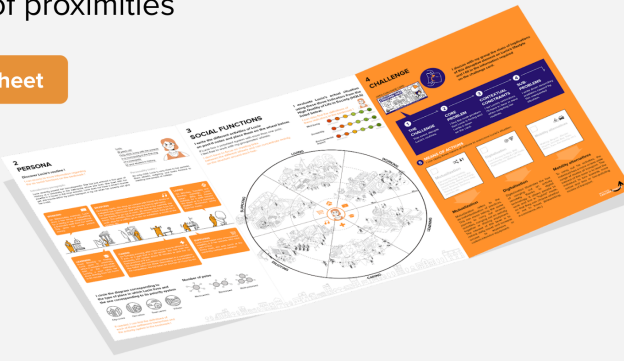2 hour

4 ressources

- Work Sheet
- Bookmark (definitions)
- Challenge card
- Certificate of completion
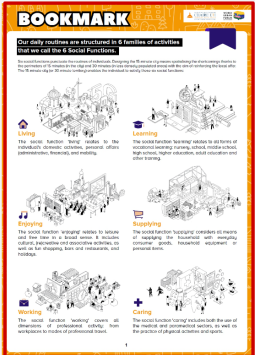
Work Sheet

Challenge card

Bookmark (definitions)

Certificate of completion

# CONCLUSION

## Towards a new frame of reference
## for urban and territorial quality of life measures

This third white paper on the 15-minute city and 30-minute territory models provides a review of the main theories, principles and indicators used today around the globe to measure quality of life at country, city or neighborhood scales, with a view to rank and compare them. Most approaches focus on objective quantitative data calculations, with only a few integrating subjective qualitative inputs on perceived satisfaction rates by residents or local community members. Main scoring methods have an angle, they analyze selected dimensions and factors about countries (or cities or neighborhoods) based on a targeted audience (political leaders, NGOs, scholars...) or with a specific purpose in mind (public policies, transportation strategies ...). This report shows the diversity of viewpoints and lenses behind the many evaluation and ranking models available today to feed new urban and territorial agendas.

The idea with the High Quality of Societal Life Index was not to create another metric but to propose a novel comprehensive framework to operationalize the 15-minute city model (and 30-minute territory adaptation), which in essence is based on four core principles : first ecology - for a green and sustainable city ; second proximity - to live with reduced distances to essential activities - third solidarity: to nurture caring relationships between people and final participation - to actively involve citizens in the transformation of their neighbourhood.

This urban model builds upon and expand the vision of renowned urbanists or architects such as Whyte[50], Alexander[51], Salingaros[52], Jacobs[53] and Gehl[54]. It has gained significant traction globally amongst mayors, urban experts, citizens, and researchers as a ripple effect of the pandemic, climate urgencies and socio-economic crisis. Therefore, a robust methodology to implement and evaluate the impact of this urban organization was needed.

The first scientific paper published by Chaire ETI researchers on the 15-Minute City model in January 2021[55] has since exceeded 57,000 full reads with 235 citations. This body of work has opened the way to a global research movement and future studies should continue to further explore challenges and opportunities presented by different contexts (geographic, environmental, economic, cultural, political, social ...).

As cities continue to grow, while facing new challenges and carrying paramount societal responsibilities, it is necessary to facilitate evidence-based decision-making that prioritizes the needs of communities and focus on the holistic quality of neighborhoods such as the High Quality of Societal Life Index.

50  Whyte, W.H. City: Rediscovering the Center; Doubleday: New York, NY, USA, 1990
51  Alexander, C. The Nature of Order: The Process of Creating Life; The Centre for Environmental Structure: Berkeley, CA, USA, 2002
52  Salingaros, N.A. Compact city replaces sprawl. In Crossover: Architecture, Urbanism, Technology; 010 Publishers: Rotterdam, The Netherlands, 2006; pp. 100–115
53  Jacobs, J. The Death and Life of Great American Cities; Random House: New York, NY, USA, 1961
54  Gehl, J. Cities for People; Island Press: Washington, DC, USA, 2013
55  Moreno, C.; Allam, Z.; Chabaud, D.; Gall, C.; Pratlong, F. Introducing the "15-Minute City": Sustainability, Resilience and Place Identity in Future Post-Pandemic Cities. Smart Cities 2021, 4, 93-111

# ANNEXES

## Annexe 1: Better life index key indicators (OECD)

| Bien-être actuel | | |
|---|---|---|
| **Dimension** | **Indicateur phare** | **Unité** |
| Revenu et patrimoine | Revenu des ménages | Revenu disponible ajusté net/hab |
| | Patrimoine des ménages | Patrimoine net médian |
| | Rapport s80/s20 de revenu disponible | Part de revenu détenue par les 20% les plus riches / part dé par les 20% les plus pauvres |
| Logement | Accessibilité financière du logement | Revenu disponible restant après les dépenses de logement |
| | Taux de surpopulation | Part des ménages vivant dans un logement surpeuplé |
| Travail et qualit de l'emploi | Taux d'emploi | |
| | Ecart salarial homme/femme | |
| | Longues heures de travail rémunéré | |
| Santé | Espérance de vie | |
| | Ecrat d'espérance de vie selon le niveau d'études | |
| Connaissances et compétence | Compétences des élève sen sciences | Scores moyens au PISA |
| | Elèves aux compétences faibles | |
| Qualité de l'environnement | Accès aux espaces verts | Par de la population urbaine vivant à 10 min de marche ou d'un espace vert |
| | Exposition à la pollution atmosphérisque | Part de la population > seuil OMS |
| Bien-être subjectif | Satisfaction à l'égard de la vie | Valeur moyenne sur une échelle graduée de 0 à 10 |
| | Bilan émotionnel négatif | Part de la population déclarant avoir éprouvé d'avantage sentiments négatifs que positif |
| Sécurité | Homicides | Pour 100 000 personnes |
| | Ecart hommes-femmes en termes de sentiment sécurité | Écart à aprtir des déclaration du sentiment de sécurité lorsque marchent seul dans la nuit |
| Equilibre vie pro / privée | Temps de loisir | |
| | Ecart h/f en termes d'heures travaillées | |
| Liens sociaux | Interactions sociales | |
| | Manque de soutien social | |
| Engagement civique | Participation électroale | |
| | Sentiment de ne pas avoir son mot à dire sur l'action des pouvoirs publics | |

| Ressources pour le bien-être futur | | |
|---|---|---|
| **Dimension** | **Indicateur phare** | **Unité** |
| Capital économique | Actifs fixes produits | Usd par habitants aux ppa de 2010 |
| | Valeur financière nette des administrations publiques | % du pib |
| | Endettement des ménages | % du revenu disponible net |
| Capital naturel | Emission de GES | Usd par habitants aux ppa de 2010 |
| | Empreinte matière | Consommation de matières premières extraites pour satisfaction demande finale de l'économie, en tonnes par habitant |
| | Liste rouge mondiale des espèces menacées | 0 = éteintes à l'échelon mondial, 1 = préoccupation mineur |
| Capital humain | Niveau d'études des jeunes adultes | % des personnes agées de 25 ) 24 ans ayant achevé au moins deuxième cycle d'enseignement secondaire |
| | Taux de sous-utilisation de la main d'œuvre | % de travailleurs au chômage découragés ou sous employés la population active |
| | Mortalité prématurée | Années potentielles de vie perdue en raison de maladies d'accidents mortels pour 100 000 habitants |
| Capital social | Confiance envers autrui | Note moyenne sur échelle de 0 à 10 |
| | Confiance envers le gouvernement | % de la population donnant une réponse positive |
| | Parté h/f | % de femmes siégeant au parlement national |

## Annexe 2 : Measurement tool indicators from the OECD's sustainable development goals in regions and cities

| sdg | target | indicator description |
|---|---|---|
| 1 | 1.1 | Average disposable incon per day of the first quinfile (equivailsed household. in USD PPP. constant prices of |
| | 1.2 | 2010) |
| | 1.3 | Percentage of population with a disposable income below the 60% of national median disposable income |
| | 1.4 | Decrease in poverty rates (national powerty line) due to transfers and taxes (5) |
| | 1.b | Rooms per person |
| | | Percentage of population satisfied with efforts to deal with poverty |
| 2 | 2.1 | Percentage of people with access to at least one food shop within 15 minutes of walking |
| | 2.3 | Productivity (Gross Value Added per worker) in agriculture, forestry and fishing (ISIC rev4) (in constant 2010 |
| | 2.4 | USD PPP) |
| | 2.4 | Change in cropland (from 1992 to 2015, percentage points) |
| | | Cropland as a percentage of total area in 2015 |
| 3 | 3.2 | Mortality rates for the 0 to 4 years old population (deaths per 10 000 people) |
| | 3.2 | Infant mortality rate (number of deaths of children one year old or younger per 1 000 live births) |
| | 3.4 | Satisfaction with life as a whole (from 0 to 10) |
| | 3.4 | Life expectancy at birth (years) |
| | 3.6 | Transport-related mortality rates (deaths per 10 000 people) |

| sdg target | | indicator description |
|---|---|---|
| 3 | 3.8 | Percentage of people satisfied with the availability or quality of healthcare |
| | 3.8 | Percentage of people with access to at least one hospital within 20 minutes of driving |
| | 3.c | Active physicians rate (active physicians per 1 000 people) |
| | 3.c | Hospital beds rate (hospital beds per 10 000 people) |
| 4 | 4.1 | Percentage of population from 15 to 19 years old enrolled in public or private institutions |
| | 4.2 | Percentage of people with access to at least one school within 15 minutes of public transport |
| | 4.2 | Percentage of people with access to at least one school within 20 minutes of walking |
| | 4.2 | Percentage of early leavers from education and training for the 18 to 24 years old population |
| | 4.3 | Percentage of population from 25 to 64 years old with at least tertiary education |
| | 4.3 | Percentage of population from 25 to 64 years old participating in education and training |
| | 4.5 | Gender gap in the rate of early leavers (male-female, percentage points) |
| | 4.5 | Gender gap in the rate of young population (from 18 to 24 years old) not in education, employment or training (NEET) (female-male, percentage points) |
| 5 | 5.1 | Percentage of population that believe women are treated with respect and dignity in their eountry |
| | 5.4 | Gender gap in employment rate (male-female, percentage points) |
| | 5.4 | Gender gap in part-time employment incidence (female-male, percentage points) |
| | 5.5 | Female reasearch and development personnel as a percentage of total research and development employment |
| 6 | 6.3 | Percentage of population satisfied with quality of water |
| | 6.6 | Change in water bodies (from 1992 to 2015, percentage points) |
| | 6.6 | Water bodies as percentage of total area in 2015 |
| 7 | 7.2 | Percentage of total electricity production that comes from renewable sources |
| | 7.2 | Percentage of total electricity production that comes from coal |
| | 7.2 | Percentage of total electricity production that comes from fossil fuels (natural gas and oil, excluding coal) |
| | 7.2 | Percentage of total electricity production that comes from nuclear power |
| 8 | 8.1 | Annual growth rate of real GDP per capita (%, from to 2008 to 2016-17) |
| | 8.2 | Employment in knowledge-intensive services as a percentage of total employment |
| | 8.2 | Annual growth rate of real GVA per worker (%, from 2008 to 2016-17) |
| | 8.3 | Percentage of labour force with at least secondary education |
| | 8.3 | Firm creation rate (%) |
| | 8.3 | Employment rate associated to newly created firms (%) |
| | 8.3 | 3-year survival rate of firms (%) |
| | 8.3 | Net firm creation rate (%) (firm birth rate minus firm death rate) |
| | 8.5 | Unemployment rate (%) |
| | 8.5 | Gender gap in unemployment rate (female-male, percentage points) |
| | 8.5 | Long term unemployment incidence (%) |
| | 8.5 | Part-time employment incidence (%) |
| | 8.5 | Employment rate (%) |
| | 8.6 | Percentage of young population (from 18 to 24 years old) not in education, employment or training (NEET) |
| | 8.8 | Employment rate of the foreign-born (%) |
| | 8.8 | Unemployment rate of the foreign-born (%) |
| | 8.8 | Over-qualification rates for the foreign-born (%) |
| | 8.8 | Gender gap in employment rate for the foreign-born (male-female, percentage points) |
| | 8.8 | Percentage of foreign-born among the total population |

| sdg target | | indicator description |
|---|---|---|
| 8 | 8.b | Youth unemployment rate (%) |
| 9 | 9.1 | Performance of public transport network, ratio between accessibility and proximity to people |
| | 9.1 | Performance of car transport network, ratio between accessibility and proximity to people |
| | 9.1 | Percentage of population satisfied with roads and highways |
| | 9.2 | Productivity (Gross Value Added per worker) in Manufacture (ISIC rev4) (in constant 2010 USD PPP) |
| | 9.2 | Gross Value Added (GVA) in Manufacture (ISIC rev4) as a percentage of GDP |
| | 9.2 | Manufacturing employment as a percentage of total employment |
| | 9.2 | Employment in high-technology manufacturing as a  percentage of total manufacturing employment |
| | 9.5 | Patent applications (PCT) per 1 000 000 people |
| | 9.5 | Percentage of labour force with at least tertiary education |
| | 9.5 | Research and Development expenditure as a proportion of GDP (%) |
| | 9.5 | Research and Development personnel as a share of total employment |
| 10 | 10.1 | Gini index of disposable income (after taxes and transfers) (from 0 to 1) |
| | 10.1 | Ratio between average disposable income of top and bottom quintiles |
| | 10.1 | Median disposable income per equivalised household (in USD PPP, constant prices of 2010) |
| | 10.1 | Growth in disposable income per capita (%, from 2008 to 2016-17) |
| | 10.1 | Average disposable income per equivalised household (in USD PPP, constant prices of 2010) |
| | 10.2 | Percentage of population with a disposable income below the 60% of regional median disposable income |
| | 10.3 | Percentage of population population that believes their place of residence is a good place to live for racial and ethnic minorities |
| | 10.4 | Decrease in Gini index due to transfers and taxes (%) |
| | 10.4 | Decrease in poverty rates (regional poverty line) due to transfers and taxes (%) |
| 11 | 11.1 | Percentage of house holds expenses dedicated to housing costs |
| | 11.1 | Percentage of polulation satisfied with affordability of housing |
| | 11.2 | Percentage of population satisfied with the quality of public transportation systems |
| | 11.2 | Performance of public transport network, ratio between accessibility and proximity to hospitals |
| | 11.2 | Performance of car transport network, ratio between accessibility and proximity to hospitals |
| | 11.3 | Difference between built-up area growth rate and population growth rate (percentage points) |
| | 11.6 | Exposure to PM2.5µg/m3, pupulation weightes (microgrmas per cubic metre) |
| | 11.6 | Percentage of population satisfied with quality of air |
| | 11.6 | Percentage of people exposed to more than 10µg/m3 (micrograms per cubic metre) of PM2.5 |
| | 11.7 | µg/m3 population with access to at least 1 hectare of green urban areas (parks) and forests within 15 minutes of walking |
| | 11.7 | Percentage of population with access to at least one recreational opportunity (theatres, museums, cinemas, stadiums or cultural attractions) within 15 minutes |
| 12 | 12.5 | Municipal waste rate (kilos per capita) |
| | 12.8 | Number of motor road vehicles per 100 people |
| 13 | 13.1 | Percentage of population satisfied with efforts to preserve the environment |
| | 13.1 | CO2 emissions per electricity production (in tons of CO2 equivalent per gigawatt hours) |
| | 13.2 | Change in cooling degree-days needed to maintain an average building indoor temperature of 22 degree Celcisus, from 1970-1984 to 2004-2018 |
| | 13.2 | Cooling degree-days needed to maintain an average building indoor temperature of 22 degree Celsius, 2004-2018 |
| | 13.2 | Change in heating degree-days needed to maintain an average building indoor temperature of 15.5 degree Celsius, from 1970-1984 to 2004-2018 |

| sdg target | | indicator description |
|---|---|---|
| 13 | 13.2 | Heating degree-days needed to maintain an average building indoor temperature of 15.5 degree Celsius, from 1970-1984 to 2004-2018 |
| 14 | 14.5 | Protected coastal area as a percentage of total coastal area |
| | 14.5 | Coastal area as a percentage of total area |
| 15 | 15.1 | Change in tree cover (from 1992 to 2015, percentage points) |
| | 15.1 | Tree cover as a percentage of total area in 2015 |
| | 15.3 | Increase in artificial areas (from 1992 to 2015, percentage points) |
| | 15.3 | Artificial areas as a percentage of total area in 2015 |
| | 15.5 | Terrestrial protected areas as a percentage of total area |
| 16 | 16.1 | Homicided per 100 000 persons |
| | 16.1 | Percentage of population that have been assualted or mugged in the previous 12 months |
| | 16.1 | Percentage of population that feel safe walking alone at night around the area they live |
| | 16.3 | Percentage of population that have confidence in judicial system and courts |
| | 16.5 | Percentage of population that believe corruption in spread throughout the government in the country |
| | 16.6 | Percentage of population that have confidence in the national government |
| | 16.6 | Percentage of population that have confidence in the local police force |
| | 16.b | Percentage of population that believes their place of residence is a good place to live for migrants |
| | 16.b | Percentage of population that believes their place of residence is a good place to live for gay or lesbian people |
| 17 | 17.6 | Share of PCT co-patent applications that are done with foreign regions (in % of co-patent applications) |
| | 17.8 | Percentage of households with broadband internet access |
| | 17.8 | Percentage of houses and buildings connected to optical fibre |

# Annexe 3 : Indicators of the regional well-being tool (OECD)

| OECD Regional well-being indicators | | | |
|---|---|---|---|
| Labour force with at least secondary | % | Air pollution (level of PM2.5) | µg/m³ |
| Employment rate | % | Voter turnout | % |
| Unemployment rate | % | Broadband access | households |
| Household disposable income | USD PPP | Number of rooms per person | per person |
| Homicide rate | 000 people | Perceived social network support | % |
| Mortality rate | 000 people | Self assessment of life satisfactio | index 0 to 10 |
| Life expectancy | number of years | | |

# Annexe 4 : *smart-cities* indicators (OECD)

| Suggested indicators for smart city tools | |
|---|---|
| **Dimensions** | **Indicator** |
| Connectivity | % households equipped with internet, wireless broadband coverage; % of households who use digital apps or platforms to connect to local community |
| Mobility | % of smart traffic lights; % of public transport equipped with real-time information; number of users of sharing economy transportation per 100 000 population; % of public parking spaces equipped with e-payment systems |
| Jobs and firms | % of job seekers who have access to e-career centres; expenditure in R&D |
| Housing and built environment | Open-source cadastral data; digital land-use and building permits |
| Health and safety | % of medical appointements conducted remotely; % of population registered with public alert systems for air and water quality; % of population with online access to their unified health file; % population equipped with real-time alert systems |
| Education and skills | % of children who have access to e-learning platforms; number of computers, laptops, tablets, or other digital learning devices available per 1 000 primary school students |
| E-government | % of city services available online; number of municipal smart stations installed per 100 000 population; % of payments to the city that are paid electronically |
| Energy, water and waste | % of households equipped with smart energy meters; % of buildings with smart electricity meters; % of smart street lights; % of households equipped with smart water meters; % drinking water under water quality monitoring by real-time water quality monitoring station; % of buildings equipped with smart waste systems |

| Examples of indicators on stakeholder engagement | |
|---|---|
| **Dimensions** | **Indicator** |
| Inclusiveness and equity | Informed and transparent identification and selection of stakeholders to be involved in the engagement process<br>Broad outreach to inform individuals and organisations<br>Stakeholders' motivations and expectations have been clearly identified (e.g. survey)<br>Equitable share of representation among categories of stakeholders |
| Clarity of goals, transparency and accountability | Clear understanding of the framework of the engagement process in terms of line authority, proposed timeline, targeted objectives, expected outcomes, etc.<br>Development of a master schedule<br>Consistent and appropriate communication between promoters of the engagement process and the stakeholders involved<br>Dissemination of concise summaries of stakeholder meetings |
| Capacity and information | Establishment of a website to educate stakeholders about how they can contribute<br>Bumber of training sessions<br>Summary reports are prepared using non-technical language<br>Existence of mediation mechanisms |
| Efficiency and effectiveness | Regular monitoring throughout the engagement proces<br>Definition of performance measures to gauge the extent of stakeholder engagement<br>Successful use of the inputs from the engagement process to achieve the desired outcomes agreed by stakeholders<br>Fulfilment of the agreed-upon purpose of the engagement process |
| Institutionalisation, Structuring and integration | Requirements for stakeholder engeagement are in place within the organisation<br>Charters and the rules of the game are clearly established |

| Adaptiveness | Outcomes of engagement processes cover short- and long-term issues<br>Regular reassessment and establishment of new methods to address gaps where the engagement process is |
|---|---|

| Suggested indicators for smart city performance | | |
|---|---|---|
| Smart city objectives | Dimensions | Indicator |
| Well-being | Jobs | Employment rate (%)<br>People satisfied with their job (%) |
| | Income | People with enough money to cover their needs (%) |
| | Housing | Overcrowding conditions (rooms per inhabitant)<br>People satisfied with affordability of housing (%) |
| | Access to services | Performance of public transport network (ratio between accessibility and proximity to amenities or people)<br>People satisfied with public transport (%)<br>Average commuting time to place of work (minutes) |
| | Education | People from 25 to 64 years old with at least tertiary education (%) |
| | Political participation | Voter turnout (voters in the last national election as a % of the number of persons with voting rights) |
| | Health | Life expectancy at birth (years)<br>People declaring good or very good health (%) |
| | Environmental quality | Exposure to PM2.5 in $\mu g/m^3$, population weighted (micrograms per cubic metre) |
| | Personal safety | Percentage of population that feel safe walking alone at night around the area they live<br>Transport-related mortality rates (deaths per 100 000 people)<br>Percentage of population that have been assualted or mugged in the previous 12 months |
| | Community | People satisfied with their city (%)<br>People with someone to rely on in case of need (%) |
| | Life satisfaction | Satisfaction with life as a whole (from 0 to 10) |
| Inclusion<br><br>Sustainability<br>Resilience | Economic | Gini index of disposable income (after taxes and transfers) (from 0 to 1)<br>Ratio between average disposable income of top and bottom quintiles |
| | Gender and LGBT+ | Gender gap in employment rate (male-female, percentage points)<br>Female research and development personnel as a percentage of total research and development employment<br>People that believes their place of residence is a good place to live for gay or lesbian people (%) |
| | Migrant and ethnic | Migrant gap in employment rate (native-foreign, percentage points)<br>People that believes their place of residence is a good place to live for migrant (%)<br>People that believes their place of residence is a good place to live for racial and ethnic minorities (%) |
| | Inter-generational | Children poverty rate (%)<br>Elderly poverty rate (%)<br>Youth enemployment rate (%)<br>Young population (from 18 to 24 years old) not in education, employment or training (NEET) (%) |

| Smart city objectives | Dimensions | Indicator |
|---|---|---|
| Sustainability | Energy | Energy consumption per capita (k goe per person)<br>Electricity production from renewable sources (%) |
| | Climate | $CO_2$ emissions per electricity production (in tons of $CO_2$ equivalent per gigawatt hours)<br>People satisfied with efforts to preserve the environment (%) |
| | Biodiversity | Change in tree cover (percentage points) |
| | Material footprint | Municipal waste rate (kilos per capita)<br>Municipal waste that is recycled (%)<br>Number of motor road vehicles per 100 people<br>Change in land consumption per capita (squared metre per capita) |
| Resilience | Health and social | Active physicians rate (active physicians per 1 000 people)<br>People with jobs that can be performed remotely (%) |
| | Institutions | Polution without access to health care (%)<br>People with confidence in the national government (%)<br>People with confidence in judicial system and courts (%)<br>People with confidence in the local police force (%)<br>People that believe corruption is spread throughout the government in the country (%) |

Source: (OECD, 2020)

## Annexe 5 : cCriteria for ranking French towns and villages ("Association des villes et villages où il fait bon vivre")

| Qualité de vie | |
|---|---|
| Sous-catégorie | Critère(s) associé(s) |
| Activité économique | Création d'entreprises |
| Sois/zones artificialisés | Distance des stations balnéaires |
| Chômage | Taux de chômage |
| Démographie | Espérance de vie |
| Diplôme le plus élevé | Taux de diplômés |
| Hébergements touristiques | Campings<br>Village vacances<br>Résidences de tourisme<br>Hôtels<br>Hôtels classés 5 étoiles<br>Hôtels classés 4 étoiles |
| PDLC* : Cultures permanentes | Vignobles<br>Vergers et petits fruits<br>Oliveraies |
| PDLC* : Eaux continentales | Cours et voies d'eau<br>Plans d'eau Lagunes littorales |

## Qualité de vie

| Sous-catégorie | Critère(s) associé(s) |
| --- | --- |
| PDLC* : Eaux maritimes | Lagunes littorales<br>Estuaires<br>Mers et océans |
| PDLC* : Espaces ouverts, snas ou avec peu de végétation | Plages, dunes et sable<br>Roches nues<br>Végétation clairsemée<br>Zones incendiées<br>Glaciers et neiges éternelles |
| PDLC* : Espaces vers artificialisés, non agricoles | Espaces verts urbains<br>Equipements sportifs et de loisirs |
| PDLC* : Forêts | Forêts de feuillus<br>Forêts de conifères<br>Forêts mélangèes<br>Pelouses et pâturages naturels |
| PDLC* : Milieux à végétation arbustive et/ou herbacée | Langes et broussailles<br>Végétation sclérophylle<br>Forêt et végétation arbustive en mutation |
| PDLC* : Mines, décharges et chantiers | Extraction de matériaux<br>Décharges<br>Chantiers |
| PDLC* : Prairies | Prairies et autres surfaces toujours en herbe à usage agricole |
| PDLC* : Terres arables | Terres arables hors périmètres d'irrigation \Périmètres irrigués en permanence<br>Rizières |
| PDLC* : Zones agricoles hétérogènes | Cultures annuelles associées à des cultures permanentes<br>Systèmes culturaux et parcellaires complexes<br>Surfaces essentiellement agricoles, interrompues par des espaces naturels importants<br>Territoires agroforestiers |
| PDLC* : Zones humides côtières | Marais maritimes<br>Marais salants<br>Zones intertidales |
| PDLC* : Zones humides intérieures | Marais intérieurs<br>Tourbières |
| PDLC* : Zones industrielle ou commerciales et réseaux de communication | Zones industrielles publiques<br>Réseaux routier et ferroviaire et espaces associés<br>Zones portuaires<br>Aéroports |
| PDLC* : Zones urbanisées | Tissu urbain continu |
| Pollution | Pollution des sites seveso |
| Propriètaire / Locataire | Ratio de propriétaires / locataires |
| Taux de natalité | Taux de Natalité |
| Villes d'eaux et santé | Stations thermales |
| Villes littorales | Ports et plages (baignade aménagée) |

PDLC* : Paysages de la commune

## Sécurité

| Sous-catégorie | Critère(s) associé(s) |
| --- | --- |
| Atteinte à la personne | Homicides pour voler et à l'occasion de vols<br>Homicides pour d'autres motifs<br>Tentatives d'homicides pour voler et à l'occasion de vols<br>Tentatives d'homicides pour d'autres motifs<br>Coups et blessures volontaires suivis de mort<br>Autres coups et blessures volontaires criminels ou correctionnels<br>Viols sur des majeurs(e)s<br>Viols sur sed mineur(e)s |
| Atteintes aux logement ou véhicule | Violations de domicile<br>Cambriolages de locaux d'habitations principales<br>Cambriolages de résidences secondaires<br>Vols d'automobiles<br>Vols de véhicules motorisés à 2 roues<br>Vols d'accessoires sur véhicules à moteur immatriculés<br>Destructions et dègradations de véhicules privés |
| Ensemble des atteintes aux biens et à l'environnement | Incendies volontaires de biens publics<br>Incendies volontaires de biens privés<br>Autres destructions et dégradations de biens publics<br>Autres destructions et dégradations de biens privés<br>Atteintes à l'environnement |
| Infrastructures renforcant la sécurité 1 | Gendarmerie |
| Infrastructures renforcant la sécurité 2 | Police |
| Vols et tentatives de vols personnels | Vols à main armée contre des établissements financiers<br>Vols à main armée contre des établissements industriels ou commerciaux<br>Vols à main armée contre des entreprises de transports de fonds<br>Vols à main armée contre des particuliers à leurs domicile<br>Autres vols à main armée<br>Vols avec armes blanches contre des particuliers à leur domicile<br>Vols violents sans arme contre des particuliers à leur domicile<br>Vols violents sans arme contre des femmes sur voie publique ou autre lieu public<br>Vols violents sans arme contre d'autres victimes<br>Vols à la tire<br>Vols à l'étalage |

## Transports

| Sous-catégorie | Critère(s) associé(s) |
| --- | --- |
| Transports par conduites | Taxi - VTC |
| Transports aériens | Aéroport |
| Autres transports terrestres | Gare |

| Commerces et services | |
|---|---|
| Sous-catégorie | Critère(s) associé(s) |
| Boulangerie | Boulangerie |
| Prêt-à-porter | Magasin de chaussures<br>Magasin de vêtements |
| Grandes surfaces d'alimentation générale | Supermarché |
| Très grande surface d'alimentation générale | Hypermarché |
| Petites surfaces d'alimentation générale | Supérette |
| Commerces alimentaires de proximité | Epicerie<br>Boucherie charcuterie |
| Marchands de poissons et magasins de produits surgelés | Produits surgelés<br>Poissonnerie |
| Services non alimentaires de proximité | Coiffure<br>Fleuriste |
| Presse | Librairie papeterie journaux |
| Artisans | Electricien<br>Entreprise générale du bâtiment<br>Maçon<br>Menuisier, charpentier, serrurier<br>Platrier / peintre<br>Plombier, couvreur, chauffagiste |
| Activités de services | Agence immobilière<br>Agence de travail temporaire<br>Contrôle technique automobile<br>Vétérinaire<br>Ecole de conduite<br>Horlogerie / Bijouterie<br>Blanchisserie-Teinturerie |
| Courrier | Bureau de poste et agence postale<br>Relais postal |
| Grands magasins et autres magasins non alimentaires non spécialisés | Grande surface de bricolage<br>Droguerie/Quincaillerie/Bricolage |
| Magasins non alimentaires spécialisés | Station essence<br>Banque, Caisse d'épargne |
| Magasins pour le foyer | Magasin d'équipement du foyer<br>Magasin de meubles<br>Magasin d'électoménager et de matériel audio-vidéo |
| Autres magasins non alimentaires spécialisés | Magasin d'article de sports et de loisirs<br>Magasin d'optique<br>Parfumerie<br>Soins de beauté |

| Santé | |
|---|---|
| Sous-catégorie | Critère(s) associé(s) |
| Etablissement de santé | Etablissement de santé |
| Maison et centre de santé | Maison et centre de santé |
| Hébergement pour personnes âgées | Maison de retraite |
| Maternité | Maternité |
| Médecins | Médecin généraliste |
| Pharmacie | Pharmacie |
| Urgences | Urgence |

| Éducation | |
|---|---|
| Sous-catégorie | Critère(s) associé(s) |
| Formations spécialisées de l'enseignement supérieur | Formation santé<br>Formation commerce<br>Section Technicien Supérieur, Classe Préparatoire aux Grandes Ecoles<br>Ecole d'ingénieurs |
| Autres formations de l'enseignement supérieur | Autre formation post bac non universitaire |
| Enseignement supérieur universitaire | Institut universitaire<br>Unité de Formation et de Recherche<br>Enseignement général supérieur privé |
| Premier degré éducation nationale | Ecole maternelle<br>Ecole élémentaire |
| Second degré éducation nationale | Collège |
| Second degré éducation nationale (autres) | Lycée d'enseignement général et/ou technologique<br>Lycée d'enseignement professionnel<br>Lycée technique ou/et professionnel agricole |

| Sports et loisirs | |
|---|---|
| Sous-catégorie | Critère(s) associé(s) |
| Cinémas | Cinéma |
| Sports d'équipes sur terrain | Terrains de grands jeux |
| Tennis | Tennis |
| Équitation | Contre èquestre |
| Sports de combat | Salle de combat |
| Sports collectifs sur terrain spécialisé | Salle spécialisée<br>Plateaux et terrains de jeux extérieurs |

| Sous-catégorie | Critère(s) associé(s) |
| --- | --- |
| Disciplines sportives extérieures u en bassin | Terrain de golf<br>Bassin de natation<br>Athlétisme |
| Autres disciplines sportives en salle | Salles de remise en forme<br>Salles multisports (gymnase) |
| Autre disciplines sportives | Roller-Stake-Vélo bicross ou freestyle<br>Sports de glace<br>Sports noutiques<br>Bowling |
| Port de plaisance | Port de plaisance |
| Ski et domaine skiable | Ski et domaine skiable |
| Musées | Présence de Musées |
| Musique | Conservatoire |
| Restaurants | Restaurant |
| Théatres | Théatre |

| Solidarité | |
| --- | --- |
| Sous-catégorie | Critère(s) associé(s) |
| Insertion pro | Réseau pour l'emploi |
| Logements sociaux | Hébergement social |
| Aide sociale à l'enfance | Action pour l'enface |

# Annexe 6 : Metroscope indicators (FNAU, AdCF, ANCT)

| Indicateur | Unité | Source |
| --- | --- | --- |
| Population municipale en 2015 | Nombre | INSEE 2015 |
| Nombre d'emplois pour 1000 actifs | Nombre | INSEE 2016 |
| Taux de participation aux élections : votants/inscrits (premiers tours des élections présidentielles et législatives) | en % | Ministère de l'intérieur, Observatoire des votes en France, 2017 |
| Nombre de licenciés sportifs | en nombre | Ministère de la jeunesse et des sports, 2015 |
| Taux de licenciés sportifs dans la population | en % | Ministère de la jeunesse et des sports, 2016 |
| Part des familles avec enfants dans les ménages | en % | INSEE 2015 |

| Indicateur | Unité | Source |
| --- | --- | --- |
| Taux de partié dans l'exécutif des métropoles | en % | Répertoire national des èlus, 2019 |
| Nombre d'espaces naturels, forestiers et agricoles par habitant | en % par habitant | Corine land Cover, 2012 |
| Nombre de jours d'ensoleillement pour une année | en nombre de jours | Météo France |
| Pourcentage de jours durant lesquels la qualité de l'air est bonne ou très bonne | en % | Indice ATMO, 2013-2015 |
| Taux de médecins spécialistes pour 100 000 habitants | en % par habitant | INSEE 2015, BPE 2017 |
| Part des bénéficiaires en affectation longue durée dans la population | en % | CNAM, INSEE 2015 |
| Nombre de places en accueil collectif et individuel rapporté aux enfants de moins de 3 ans | en % | CAF 2014, INSEE 2015 |
| Présence de bibliothèques municipales pour 1000 habitants | en nombre pour 1000 habitants | INSEE, Ministère de la culture 2015 |
| Capacité d'accueil pour les personnes âgées | en nombre | Finess 2018 |
| Population de 80 ans ou plus en 2015 | en nombre | INSEE 2015 |
| Taux d'équipement d'accueil pour les personnes âgées: nombre de places en EHPAD rapporté aux 80 ans ou plus | en % | Finess 2018, INSEE 2015 |
| Nombre de minutes passées en moyenne chaque jour dans les embouteillages | en minutes | INRIX, 2016 |
| Nombre d'années de revenu pour s'acheter un T3 dans l'ancien | en années | Perval 2015 |
| Revenu médian disponible par unité de consommationt | en € | INSEE, FILOSOFI 2015 |

| Conditions d'admission catégories | Conditions d'admission Sou-items évalués |
| --- | --- |
| Politiques de l'energie et de l'environnement | Protection de la qualité de l'air<br>Protection de la qualité de l'eau<br>Consommation d'eau potable des résidents<br>Différenciation des ordures ménagers rsu<br>Transformation des ordures industriel et domestique<br>Purification des eaux usées<br>Economie d'énergies a l'intérieur des bâtiments prives et des installations publiques<br>Production énergétique publique provenant des sources renouvelables<br>Réduction de la pollution visuelle et de la nuisance sonore provenant de la circulation routière<br>Réduction de la pollution lumineause provenant des installations publiques<br>Consommation d'énergie électrique des familles résidentes<br>Préservation de la biodiversité<br>Exigence facultative et supplémentaire |

| Conditions d'admission catégories | Conditions d'admission Sou-items évalués |
|---|---|
| Politiques infrastructurelles | Pistes cyclable efficaces facilitant l'accès aux bâtiments publics<br>Longueur, (en km), des pistes cyclables urbaines réalisées par rapport au totale des kms de rues urbains<br>Parkings pour vélo dans les zones d'échange<br>Planification de mobilités alternatives aux voitures privées<br>Suppression des barrières architecturales<br>Facilité de la vie familiale et femmes enceintes<br>Facilité d'accessibilité aux services médicaux<br>Aides à la distribution des marchandises dans les centres urbains<br>Pourcentage de résidents qui se déplacent quotidiennement pour se rendre au travail dans une autre<br>Autre exigence facultative et supplèmentaire |
| Politiques pour la qualite urbaine | Plan d'adaptation aux difficultés urbaines<br>Interventions pour la récupération et la valorisation du centre-ville : mobiliers urbains, signalisation, touristiques, antennes, conservation du paysage urbain<br>Récupération et réalisation de zones vertes de socialbilité avec des plantes et des arbres fruitiers<br>Politique facilitant la vie sociale urbaine ("horaire maison-travail, crèches, etc.)<br>Requalification et réutilisation de zones marginales<br>Usage des NTIC dans le développement de services interactifs aux citoyens et touristes<br>Bureau de service pour l'architecture durable (bioarchitecture etc.)<br>Ville câblée : fibre et réseau sans fil<br>Télésurveillance et réduction des pollutions urbaines (bruits, systèmes électriques)<br>Développement<br>Promotion d'un urbanisme durable privé (maisons passives)<br>Promotion d'infrastructures sociales (banques du temps) projets de freecycling<br>Promotion d'un urbanisme durable public (masions passives)<br>Récupération/réalisation de zones vertes productives, avec des plantes productives et/fruitères dans périmètre urbain<br>Création d'espaces pour la commercialisation de produits locaux<br>Protection/valorisation des boutiques identitaires - création de centres commerciaux naturels mètres cubes de ciment des infrastructures, parraport aux zones vertes urbaines |
| Politiques agricoles, touristiques et artisanales | Développement de l'agroècologie<br>Préservation des produits et des ouvrages artisanaux identitaires, (certifications, musées de la culture matérielle, etc.)<br>Valorisation des techniques de travail et des métiers traditionnels<br>Valorisation des zones rurales, (plus grande accessibilité aux services des résidents)<br>Usage de produits du territoire, si possible biologiques, dans la restauration, si possible biologiques, dans la et dans l'alimentation privée<br>Valorisation et conservation des manifestations culturelles locales<br>Capacité extra-hôtelière (lits/résidents par an)<br>Interdiction de l'utilisation des OGM en agriculture<br>Nouvelles prévisions pour les plans d'aménagement des terrains anciennement agricoles |
| Politiques pour l'hospitalite et la formation | Bon accueil, formation des employés, signalisation, infrastructures, et horaires adaptes) sensibilisation des opérateurs et des commerçants, (transparence dans les offres et dans les prix pratique exposition visible des tarifs)<br>Disponibilité d'itinéraires « slow » (imprimés, web, etc.)<br>Adoption de techniques participatives efficaces pour activer les procédures de communication de ba dans les décisions administratives plus importantes<br>Formation permanente de formateurs et/ou d'administrateurs sur les thématiques de cittaslow<br>Education à la santé (lutte contre l'obésité, diabète, etc.)<br>Renseignement systématique et permanent aux citoyens sur le sens d'être cittaslow<br>Présence d'associations actives qu'ils opèrent en accord avec l'administration sur les sujets de cittas<br>Adhésion aux campagnes de cittaslow<br>Insertion dans le papier en-tête et dans le web de la marque cittaslow |

| Conditions d'admission catégories | Conditions d'admission Sou-items évalués |
|---|---|
| Cohesion sociale | Mesure des discriminations<br>Mesure de l'existence de quartiers ghetto<br>Mesure de l'intégration des handicapés<br>Mesure de l'intégration des enfants<br>Mesure des conditions de vie des jeunes<br>Mesure de la pauvreté<br>Existence d'un réseau associatif<br>Mesure de l'intégration multiculturelle<br>Mesure de la participation politique<br>Pourcentages de logements sociaux<br>Existence d'endroits réservés aux activités des jeunes et centres pour la jeunesse |
| Partenariat | Soutien aux campagnes et aux activités de slowfood<br>Collaboration avec slowfood et d'autres organisations faisant la promotion de la nourriture naturelle et traditionnelle<br>Soutien de projets de jumelage et de coopération au développement avec des pays en voie de développement concernant également la diffusion des philosophies de cittaslow de slowfood |

## Annexe 7 : Liveability Index (AARP) indicators

| LOGEMENT | | |
|---|---|---|
| Item | Sous-item | Mesure |
| Métriques | | |
| Accessibilité des logements | Logement avec entrée de plein pieds | % d'unité de logement |
| Choix delogement disponibilité de logement multifamiliaux | Disponibilité de logements multifamiliaux | % d'unité de logement |
| Logement abordable | Frais de logement<br>Fardeau du coût du logement<br>Disponibilité de logements subventiones | Coût mensuel<br>Par du logement dans le revenu mensuel<br>Nb d'unité delogements subventionnés par habitants |
| Politiques / Stratégies | | |
| Lois nationales et locales sur la conception des logements | | |
| Fonds fiduciaires nationaux et locaux par logement | | |
| Information et protection des habitants mobile home | | |
| Prévention et atténuation des saisies de par l'état | | |
| Plans nationaux et locaux pour la qualité seniors | | |

## QUARTIER

| Item | Sous-item | Mesure |
|---|---|---|
| Métriques | | |
| Proximité des lieux d'intérêt | Accès aux épiceries et marchés fermiers | Nb d'épiceries et marchés dans un rayon |
| | Accès aux parcs | Nb de parcs dans un rayon d'1/2 mile |
| | Accès au bibliothèque | Nb de bibliothèques dans un rayon d'1/2 mile |
| | Accès aux emplois par transport en commun | Nb d'emplois dans un trajet de 45 mile |
| | Accès aux emplois par voiture | Nb d'emplois dans un trajet de 45 mile |
| Mixité fonctionnelle | Diversité des lieux d'intérêt | Diversité des emplois dans un rayon |
| Compacité | Densité d'activité | Nb combiné d'emplois et de personnes |
| Sécurité | Taux decriminalité | Nb crime combinés violents et contre les 10 000 habitants |
| Qualité | Taux de vacances | % de logements vacants |
| Politiques / Stratégies | | |
| Programmes nationaux et locaux de sous développement axé sur le transport en Program | | |
| Plans nationaux et locaux pour la qualité seniors | | |

## TRANSPORTS

| Item | Sous-item | Mesure |
|---|---|---|
| Métriques | | |
| Practicité | Fréquen du service de transport | Nb bus et trans par heure |
| Accessibilité | Accès des staions et véhicules pour les PM | Nb de staions et véhicules accessible |
| Options de transports | Balades piétonnes Congestion | Nb d'heure moyen passé dans la circulation |
| Coûts | Frais de transport des ménages | Estimation annuelle |
| Sécurité des rues | Limitation de vitesse Accidents | Limite de vitesse rues et auto route Nb accidents mortel pour 100 000 habitants |
| Politiques / Stratégies | | |
| Politique nationales et locales de sécurité dans rues | | |
| Coordination du transport et des service personne | | |
| Politique de soutien aux conducteurs l'Etat | | |
| Plans nationaux et locaux pour la qualité de seniors | | |

## ENVIRONNEMENT

| Item | Sous-item | Mesure |
|---|---|---|
| Métriques | | |
| Qualité de l'eau | Qualité de l'eau potable | % de personnes exposées à des pb de sacours de l'année |
| Qualité de l'air | Qualité de l'air régionale | Nb de jours de mauvais qualité de l'année |
| | Pollution à proximité de la chaussée Pollution industrielle locale | % de population vivant à moins de 200 m route à fort trafic Indice de toxicité des produits chimique suspension dans l'air 0 à 311 000 |
| Politiques / Stratégies | | |
| Politique interdisant la déconnexion aux publics | | |
| Plans locaux d'atténuation des risques multiples | | |
| Tableau de bord de l'efficacité énergétique | | |
| Plans nationaux et locaux pour la qualité de seniors | | |

## SANTE

| Item | Sous-item | Mesure |
|---|---|---|
| Métriques | | |
| Santé de la population | Prévalence du tabagisme Prévalence de l'obésité Accès à des lieux d'exercice | Taux de tabagisme estimé Taux d'obéstié estimé % de personnes vivant à moins d'1/2 mile et 1 mile desinstallations de loisir, 3 mile zones rurales |
| Accès aux soins | Zone de pénurie de professionnels de snaté | Indice de 0 à 25 |
| Qualité des soins | Taux d'hospitalisation évitable | Nb d'admission à l'hôpital pour des malade auraient pu être traitée en soins ambulance |
| | Satisfaction des patients | % de patiens qui donnent une note de hôpitaux de la région |
| Politiques / Stratégies | | |
| Lois nationales et locales d'interdiction dans les lieux publics | | |
| Plans nationaux et locaux pour la qualité seniors | | |

## ENGAGEMENT CIVIC ET SOCIAL

| Item | Sous-item | Mesure |
|---|---|---|
| Métriques | | |
| Accès internet | Coût et vitesse du haut débit | % de résidents ayant accès au service haut faible coût |

| Item | Sous-item | Mesure |
|---|---|---|
| **Métriques** | | |
| Engagement civique | Possibilité d'engagement civique | Nb d'organisation ciques, sociales, religion politiques et commerciales pour 10 000 |
| Taux de participation aux élections | | |
| Engagement social | Vote | % de personnes ayant voté |
| | Indice d'engagement social | Mesure de la fréquence des interactions amis et voisins |
| | Institutions culturelles, artisitques et de divertissement | Nb d'entreprises et d'établissements artisan 10 000 habitants |
| **Politiques / Stratégies** | | |
| Absence de politiques étatiques empêchant d'exploiter des réseaux publics à bandes | | |
| Lois faciliant le vote anticipé, absent ou postal | | |
| Commission locales des droits de l'himme | | |
| Lois locales anti-discrimination des personnes LGBT | | |
| Plans nationaux et locaux pour la qualité de seniors | | |

### INCLUSION

| Item | Sous-item | Mesure |
|---|---|---|
| **Métriques** | | |
| Egalité des chances | inégalité des revenus | Coefficient de Gini |
| Opportunité économique | Emplois par travailleur | Nb d'emplois par personne dans l'effectif de la zone métropolitaine |
| Opportunité éducative | Taux d'obtention du diplôme d'études secondaires | Taux d'étudiants diplômés |
| Communautés multigénérationnelles | Diversité d'âge | Diversité des groupes d'âge de la population par rapport à la population nationale |
| **Politiques / Stratégies** | | |
| Solvabilité du gouvernement local | | Nations des obligations générales AA administrations locales |
| Augmentation du salaire minimum de l'état | | Salaire minimum de l'Etat > au salaire fédéral et ajusté en fonction des augment coût de la vie |
| Elagissement par loi locale du congé far médical | | |
| Plans nationaux et locaux pour la qualité de seniors | | |

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Chaire Entrepreneuriat Territory Innovation (Chaire ETI) is a research lab anchored at IAE Paris, University Paris 1 Panthéon Sorbonne, specialized in urban and territorial transformational projects. We are a group of transdisciplinary researchers from Humanities and Hard Sciences.

We believe the central urban question is no longer how to design a "Smart City" but how to repare our cities and territories by rethinking their organization through the lenses of Proximities and Quality of Societal Life.  Our work explores new ways to fight climate change, social fragmentation, and community exclusion in cities and territories. We have done extensive research on the question of short distance and quality of life. This body of knowledge is called "the 15-minute city" & "30-minute territory" models.

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