



BUILD VIBRANT LOCAL ECONOMIES

INTEGRATED GUIDELINES FOR SUSTAINABLE NEIGHBOURHOOD DESIGN

Urban Morphology & Complex Systems Institute

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SERGE SALAT

URBAN MORPHOLOGY
&
COMPLEX SYSTEMS INSTITUTE

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&
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Author: Serge Salat, Civil Administrator, Architect and Urban Planner; President of the Urban Morphology and Complex Systems Institute.

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BUILD VIBRANT LOCAL ECONOMIES

INTRODUCTION

Economic development is a crucial objective for any neighbourhood project. Building capacity and linkages with businesses at an early stage is key to local growth and can increase revenue. A clear link exists between poverty reduction and business growth¹. Sustainability offers many possibilities to increase neighbourhood revenues and support local economies. Successful approaches develop innovative products. They view 'wastes' as potentially saleable by-products. Local recruitment and using nearby suppliers can boost inclusive economic improvement. Sustainability actions offer opportunities to

- develop new local products benefiting to the environment and society
- find markets for by-products or waste

Two business models at neighbourhood level are

- Smaller producers finding ways to enter the regional market, often with premium goods which bypass conventional distribution systems, featuring organic and 'fair trade' products.
- Social enterprises, not-for-profit organizations, and co-operatives creating innovative solutions that provide a social, environmental or economic value to the community. Examples include 'digital dividend' programmes bringing telecommunications and internet access to poor populations. They also feature solar power projects introducing electricity to off-grid communities.

These solutions benefit vulnerable groups and avoid excluding them from economic activity.

Mixed use (the co-location of dwellings, jobs, social amenities such as education and health, commercial and recreational space) contributes to the vitality of communities. Situating a set of uses in a neighbourhood encourages walking to stores and facilities through connected street patterns and paths. It provides a critical mass of customers to businesses. It creates chances for people to work locally. It offers many residents the opportunity to participate in activities and encounter. In addition, planning for mixed use reduces travel distances, contributes to the shared use of buildings and parking spaces and supports the affordability of local communities.

A sustainable economy addresses resource consumption and the broader context in which lifestyles occur – acknowledging people's aspirations for happiness, recognizing the ecological and material limits to meet demands. Furthermore, the principles of circular economy should be incorporated into an integrated planning approach and into all phases of a building's cycle. In an ideal circular construction chain, the buildings are designed in such a way that materials will have the longest possible lifespan through reuse or repurposing. The benefits of circular economy in the construction chain include the need for new construction, improving urban land use, reducing construction and operating costs, and increasing resource efficiency, while strengthening the local economy.

This chapter contains four sections.

[DEVELOP A STRATEGIC ECONOMIC PLAN](#)
[BUILD COMMUNITY CAPACITY](#)
[ENCOURAGE MIXED-USE DEVELOPMENT](#)
[ENCOURAGE SUSTAINABLE LIFESTYLES](#)

¹ SustainAbility/International Finance Corporation/Ethos Institute 2002.

DEVELOP A STRATEGIC ECONOMIC PLAN

Long-term in scope, economic development plans provide a path that communities can follow to overcome diverse and often difficult situations. They allow accomplishing measurable economic growth. Residents take control, set clear goals, and design

policies and programmes to achieve them. Economic plans are reviewed on an annual basis. Most are recreated entirely every three to five years – often sooner given the rate of transformation in the current economy – to ensure that they meet changing needs.

CREATE AN ECONOMIC PLAN IN FIVE STEPS²

Assess the context and needs

- Rapid population growth or decline.
- Booming economy or stagnation.
- Job creation or retention issues.
- Economic stability or unpredictable markets.
- Public and private partnerships and investment.
- Human resource development, education and training.
- Housing growth.
- Commercial and industry stock.
- Existing local resources.
- Social, recreational, arts and cultural development.

Assemble an alliance

- Local elected officials.
- Local economic development organization representatives.
- Leaders within the business community.
- Resident members.
- Non-profit agencies.
- Local churches or places of worship.
- Local or regional workforce development office member.
- Local associations (environmental, reintegration).

Develop

Create a working plan with key milestones. At minimum, the plan should include a vision, mission, goals, strategies and actions. Keep things as simple and straightforward as possible. The success hinges on activities, investments and programmes. Milestones should contain tasks, deadlines and costs for completion and implementation. When creating the plan:

- Use economic and demographic data from research, analysis and forecasting
- Rely on the place natural assets to establish realistic goals
- Recognize strengths, opportunities, weaknesses and potential threats
- Gain an understanding of future market trends
- Integrate public input and dialogue. Success requires buy-in, support and feedback from the inhabitants.

Implement

Prioritize by short-, medium- and long-term goals, and consider costs.

- **Short-term**, quick-win programmes might include
 - Creating a list of all commercial, office and industrial businesses
 - Establishing an annual report card to monitor and track economic growth
- **Long-term**, strategic programmes might include
 - Improving local education to meet the employment needs of a targeted industry
 - Cultivating social, cultural, arts and recreational infrastructure – such as bike trails, nature conservation areas and other amenities
 - Developing technology-based apps and hi-tech tools.

² Adapted from: Dan Botich. How to Develop a Strategic Economic Development Plan.

<http://www.sehinc.com/authors/dan-botich>

Update

Continuously evaluate the plan to ensure consistency with the vision, mission and goals. Use progress-

monitoring tools and modify regularly – always weighing evolving economic trends and emerging technologies.

CREATE ECONOMIC DEVELOPMENT WITH ENVIRONMENTAL PRODUCTS AND CIRCULAR ECONOMY STRATEGIES

Sustainable environmental products and services are part of a new business model based on circular economy. The current economy is linear. Things are made with virgin raw materials, employed and then thrown away. In contrast, circular economy keeps goods and materials at their highest value for as long as possible, through recirculation and remanufacturing. It delivers products as shared services. Shifting towards such a model has multiple benefits: expense savings from diminished resource use, emissions decrease, and inclusive jobs.

Three principles characterize circular economy³

- **Value preservation** – maintaining the highest possible value from input materials in manufacturing processes and final products. This involves repurposing, refurbishing, repairing and reusing components.

- **Resource optimization** – limited, efficient and lessened intake of primary resources combined with improved waste collection, recycling, energy recovery from material incineration and use of renewable sources.
- **System effectiveness** – minimizing leakage during the production/consumption cycle and addressing externalities such as land, air, water and noise pollution.

Circular economy encompasses the whole life cycle of the product. It includes markets for green infrastructure and pollution reduction, such as water supply, waste management, soil remediation, air and water contamination control. Small enterprises may adopt these activities – from the extraction of raw materials to disposal. Communities in emerging cities have advantages. They can skip the technology stages.

BUILD COMMUNITY CAPACITY

Community capacity addresses social and economic issues in places experiencing significant challenges.

Today the world is facing a wave of industrial change with the restructuring of enterprises closing plants and other large job sites. Many cities and neighbourhoods look for innovative types of economic pursuits: alternative specialities, greater diversification, new forms of entrepreneurship. The global slowdown will hit the most vulnerable areas harder. Joblessness and company closures are increasing most rapidly in regions where unemployment and weak demand were already problematic. The poverty, exclusion and lack of work are exacerbated in periods of economic downturn.

Priorities are to rebuild capacity in disadvantaged communities and maintain activity in difficult economic times. Employment, initiative and enterprise

performance are key domains to which community capacity building can contribute, and this goes hand in hand with more intangible factors, encompassing increasing social capital and social cohesion. Worthy jobs, heightened levels of entrepreneurship, business sustainability are all potential indicators of enhanced resilience. Capacity building aims to enable all inhabitants, and first the poorest and most disadvantaged, to develop skills and competences.

It takes actors and assets to establish businesses in a neighbourhood. The development capacity depends on the private, public and voluntary sectors, and on the residents. Measures to promote entrepreneurship are a prerequisite for sustainable regeneration. The most effective strategies give a role to many inhabitants. Households have an interest in their community, for

³ Ellen MacArthur Foundation 2015.

working or running a business, for volunteering for a charity, for engaging in education, for playing in a sports team. The time allocated to each action differs from person to person but the various 'economic' pursuits in neighbourhoods are all interconnected.

Key action policy-makers can undertake are

- Boost enterprise, social capital and capacity in disadvantaged areas.
- Maximize the interrelationships between the social economy, community capacity and other sectors. Horizontal interventions and strategies must complement 'vertical' approaches'.
- Ensure that support—for example, information, mentoring and finance—is focused on diverse residents, services and agencies.
- Establish a 'civic infrastructure' – with room for social interaction and networks. Community spaces with no obvious economic benefits should

be part of capacity building. Areas where people and groups can meet are strategic elements for creating 'new' places of business in Barcelona and Stockholm for instance.

- Ensure that residents make most decisions. Social capital and community capacity are less likely to be created from outside. Ultimately, it is the community who has the understanding, ability and motivation to shape its future.
- Encourage local initiatives, such as skills exchange networks, local currencies, reintegration and training associations.

These measures build strength, resilience and the conditions for generating social and economic activity. They allow employers to set up in an area and create better and socially just businesses, with local knowledge and networks. The role of social innovation in solving multiple and complex problems should not be underestimated.

CASE STUDY: PALMAS BANK—BRAZIL



Palmas Bank, Brazil.

In Brazil, Palmas Bank, has been opened in Conjunto Palmeiras, a settlement in north-east Brazil with a population of approximately 30,000. Faced with major difficulties, including the lack of basic services such as water, electricity, transport and health, the Association of Residents of Conjunto Palmeiras, proposed a community bank to support local development.

Palmas Bank has three main characteristics

- management responsibilities fall to the community.
- an integrated process of local improvement promotes credit, production, marketing and training.
- the bank issues a local currency (Palmas currency), which complements the official one (real). Local producers, traders and consumers use it.

This establishes a unified market within the community. The Bank developed an alternative microcredit line for producers and consumers. Tools such as a credit card and social currency encourage local consumption. New commercialization modes (fairs, shops/solidarity stores) foster job creation and income generation.

The Palmas Bank strives to tackle community needs by engaging in programmes to provide training to vulnerable young people and women. It raises awareness of indigenous goods and services benefits. It builds a network of producers and traders. It promotes co-operatives.

Palmas Bank takes a holistic view and seeks to address the multifaceted combination of factors to establish sustainable employment and local development.

ENCOURAGE MIXED-USE DEVELOPMENT

BENEFITS OF MIXED USE DEVELOPMENT

The automobile rise has segregated urban activities.

Places where most people work, shop, learn, and play are remote from one another, and none is within walking distance of home, leaving the car as the only convenient way to get around. Functional zoning has further worsened the problem by designating large areas for single uses only. This has increased time spent in commuting, congestion and pollution. Moreover, transportation represents a significant part of poor household expenses, often between 30% and 40%.

Quite the opposite, mixed-use development contributes to inclusiveness and to the community vitality. Mixed-use development, of residential, commercial and community space, is pivotal to achieving integrated and successful communities with reduced car dependence. It brings all daily needs – shopping, entertainment, education, healthcare, open space and recreational facilities – at walking distance from neighbourhood inhabitants. Residents interact with diverse activities in a dynamic community. A flow of different users throughout the day and evening creates vibrant and safe places. Building mixed-use developments at high densities can also reduce the need to develop greenfield sites.

The benefits of mixed development⁴

- Cohesion and interaction between diverse groups.
- Socially mixed communities.
- Convenient access to facilities.
- Travel-to-work congestion minimization.
- Urban vitality and street life.
- Visual stimulation within close proximity.
- A feeling of safety, with ‘eyes on streets’.
- Energy efficiency .
- Optimized use of space and buildings.
- Consumer choice of lifestyle, location and building type.
- Viability of urban facilities and support for small business.

Mixed-use development has dimensions beyond land. It mixes incomes, generations, and housing types. Communities with a mix of land uses demonstrate higher civic trust. Residents who live within walking distance of parks and businesses are more likely to experience chance encounters with their neighbours, which increases social bonds and fosters civic trust⁵. Placing residential, commercial, healthcare, green and recreational spaces next to each other (in the same integrated block like in Kampung Admiralty in Singapore for instance) can facilitate such encounters.

⁴ Adapted from Llevelyn Davies 2000.

⁵ Leyden 2003 ; Lund 2002 ; Boessen 2017.



Kampung Admiralty HDB housing in Singapore. Section showing the 3D layering of housing, mix use (food court, retail), health, children and elder care amenities, and gardens in the sky with a terraced community farm. Architect: WOHA.



The entire ground floor of Kampung Admiralty is a shaded public plaza fostering a sense of community. Photos: ©Françoise Labbé.

Mixed-use developments provide an increased sense of community resulting from the layering and interaction of different activities and occupation

patterns. Mixed use encourages socialization at multiple scales – in a neighbourhood, along a street or

within a block or a building⁶. Mixed-use places are safer than single-use areas. Research on high-crime neighbourhoods in Los Angeles found that introducing more housing in commercial zones increases stewardship, offers more 'eyes on the street' and reduces criminality⁷. Besides having residential, lifework and commercial units, providing community facilities is important to creating and maintaining sustainable communities.

Providing lifework units and commercial space offers the opportunity to work locally and a stress-reducing alternative to commuting with the associated time and environmental impact savings.

Mixed-use guarantees access to amenities close to where people live. It reduces travel distances. It distributes and level traffic flows, supports the shared use of buildings and parking spaces. Integrating homes, workplaces, shops and services facilitates shorter journeys.

High-density mixed-use supports affordability. It diminishes the costs of transactions, of economic activities, and of services and housing. Proximity decreases the waste of time and resources, thereby lowering general costs. Policies favouring social diversity promote an equitable allocation of urban public resources and provide adequate housing for different income groups through planning regulations.

BENCHMARKS OF MIXED USE DEVELOPMENT

How fine grain should be mixed use? Key benchmarks at city scale in Inner Paris (*intra muros*)

Paris with 2,148 million inhabitants on 85.5 km² (without the woods) comprises 83,720 premises on the ground floor in 2017, of which 62,507 are commercial services and 21,213 are other facilities on the ground floor (wholesale stores, offices in shops, vacant spots).



⁶ Henkin and Zapf 2006.

⁷ Anderson et al. 2013.

Key benchmarks are as follows⁸

- Number of ground floor commercial premises per ha: 7.4
- Commercial premise area per ha: 740 m²
- Average size of commercial premise: 100 m²

- Number of cafes and restaurants per 1000 inhabitants: 6.4
- 1 commercial premise per 34 inhabitants
- 1 food store per 280 inhabitants
- 1 bakery per 1,811 inhabitants

- Number of ground floor commercial premises per 100 m of street: 4.3 on average (6 in the central districts)

- Number of ground floor commercial premises per 1000 inhabitants: 29 on average (more than 50 in the central districts)

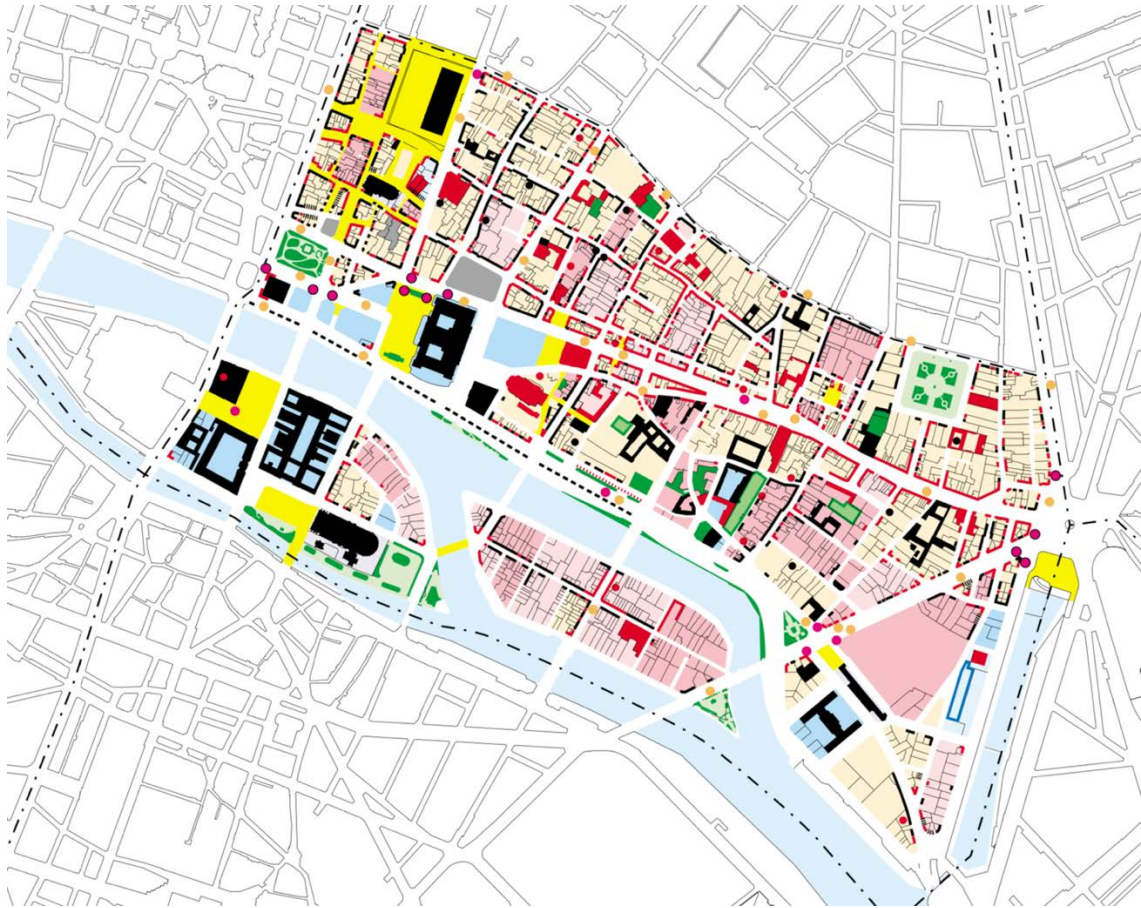
The districts in the centre of Paris (from the 1st to the 11th) are those where the density of shops and commercial services is the most elevated. It amounts to around 6 shops per 100 metres of street and more than 50 shops per 1000 residents. The 6th district (8.1 shops per 100 metres of street) and the 1st (139 shops per 1,000 inhabitants) offer the highest retail density.

Key benchmarks at neighbourhood scale – Paris Le Marais



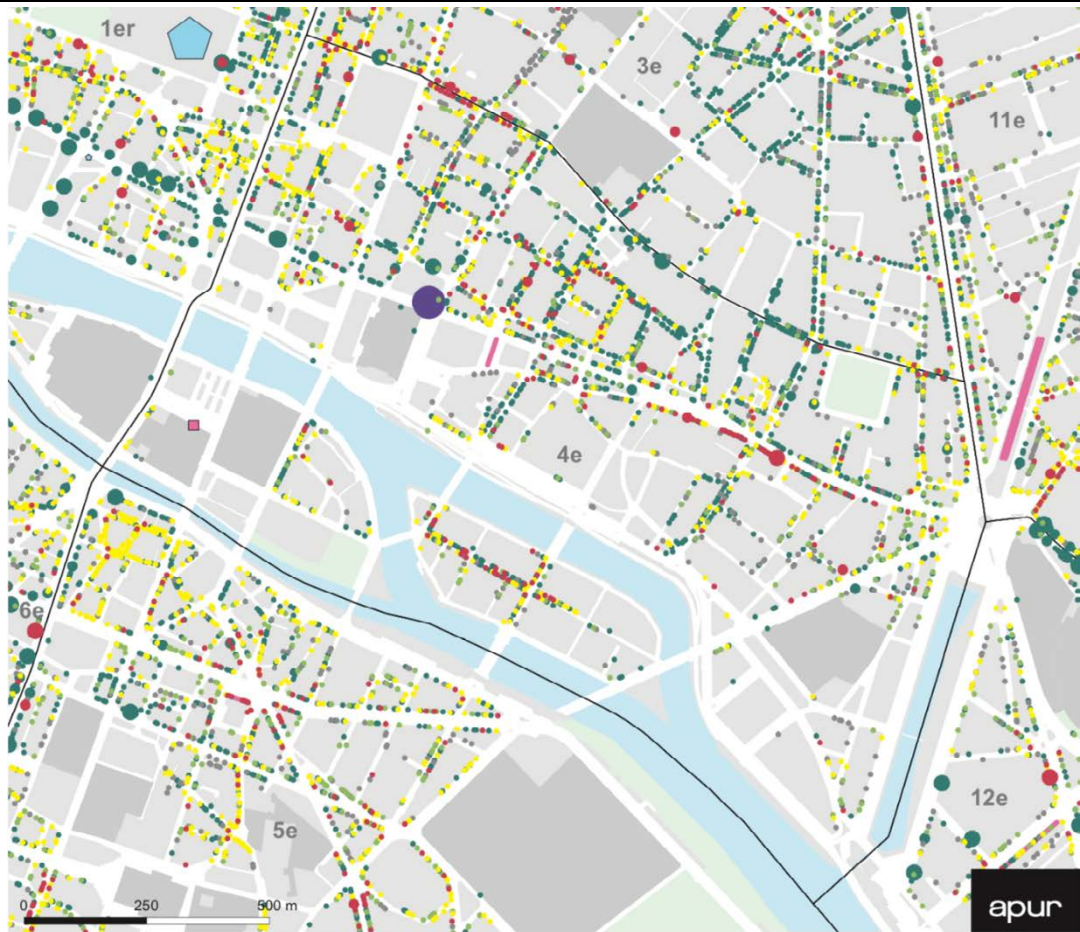
*Left: Rue des Rosiers, seen from the west side, the oldest (13th century). Photo: Wordridden.
Right: A bakery and pastry shop at no 27, rue des Rosiers already present in 1865. Photo: Jean Melis.*

⁸ Source : APUR 2014 and 2017.

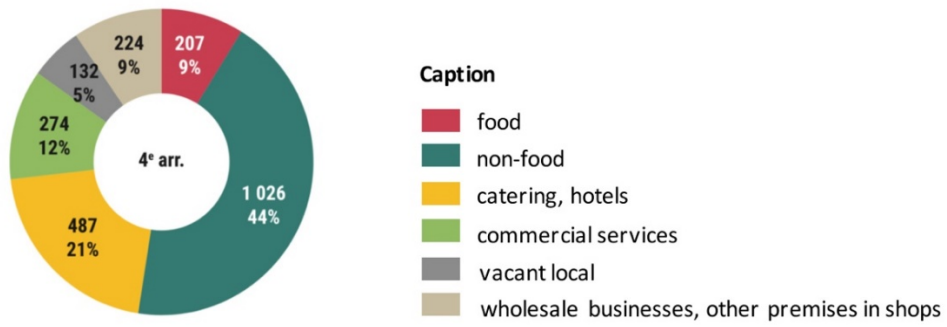


Activities distribution map. Paris fourth district. Source: APUR 2001.

Mobility		Commercial activities	
<ul style="list-style-type: none"> ● Bus stops ● ● Subway stations, transfer stations ● ● Regional Express Train stations, transfer stations ● Train stations 		<ul style="list-style-type: none"> ▬▬▬▬ covered markets, fairgrounds ▬▬▬▬ continuous, discontinuous, local level shops along streets (food, cafes, bars, restaurants, bank branches, supermarkets) ▬▬▬▬ continuous, discontinuous, global level commercial activity along streets (commercial activities other than local including cabarets, nightclubs, galleries, wholesalers, insurance agencies, real estate, non-commercial activities) ▬▬▬▬ linear mixed activities (local and global) department stores, large specialized brands, shopping malls ▬▬▬▬ pedestrian areas ▬▬▬▬ 	
Services to inhabitants		Dominant functions	
<ul style="list-style-type: none"> ■ ● equipment, local level integrated equipment ■ global level equipment (including museums, cinemas, theatres, concert halls) ■ public gardens ■ sports grounds ■ cemeteries 		<ul style="list-style-type: none"> ■ Housing ■ very strong ■ strong ■ Employment ■ very strong ■ strong ■ Mixed-use 	



Commercial structure Paris 4th district. Source: APUR 2017.



Caption

- food
- non-food
- catering, hotels
- commercial services
- vacant local
- wholesale businesses, other premises in shops



Left: Jo Goldenberg's restaurant in the rue des Rosiers, in le Marais, Paris, France. Photo: David Monniaux.
Right: A bakery in the Pletzl.

4th district key figures

- Area: 160.1 ha
- Street length 31.15 km
- **Street length per km²: 19.5**
- Population: 28,088 inhabitants
- **Residential density: 17,555 h/km²**
- Number of dwellings: 22,550
- **Density of dwellings: 140 dwellings/ha**
- Jobs: 41,215 jobs
- **Job density: 25,760 jobs/km²**
- Population + jobs: 69,303
- **Population + job density: 43,314 people + jobs/km²**



A bakery, with a mosaic frontage, at no 24 rue des Écouffes on the corner with rue des Rosiers.

Key figures commercial premises

- Number of premises on the ground floor: 2350
- Number of commercial premises: 1994
- **Number of ground floor premises per ha: 14.7**
- **Number of commercial premises per ha: 12.46**
- **Number of commercial premises per 100 m of street: 6.4**
- **Number of commercial premises per 1,000 inhabitants: 74**
- Number of food retail places per 1000 inhabitants: 7.4
- Number of non-food retail places per 1000 inhabitants: 36.6
- Number of restaurants and hotels per 1000 inhabitants: 17.39

Positive outcomes of high job resident ratio at city and district scale in Paris

Paris scale

Paris has a high job/resident ratio. Most active population living there also work in Paris and most work in their district.

- Job/resident ratio: 0.83
- Ratio of number of jobs/active population⁹ in Paris: 1.68
- Percentage of active working population living in Paris that work in Paris: 68.3%
- Automobile equipment: 66% of households don't own a car

The high job resident/ratio and the high availability of local jobs (1.68 jobs per active working resident) ensures that more than two thirds of the active population living in Paris work in the city. Along with the excellent walkability provided by a highly connected and extensive street network (most districts have 19 km of streets/km²), proximity of jobs makes people move away from cars (two thirds of households don't own a car). People go to work using public transport (64.6%), walking and cycling (15%). Only 11.2% use a car¹⁰.

Paris 4th district scale

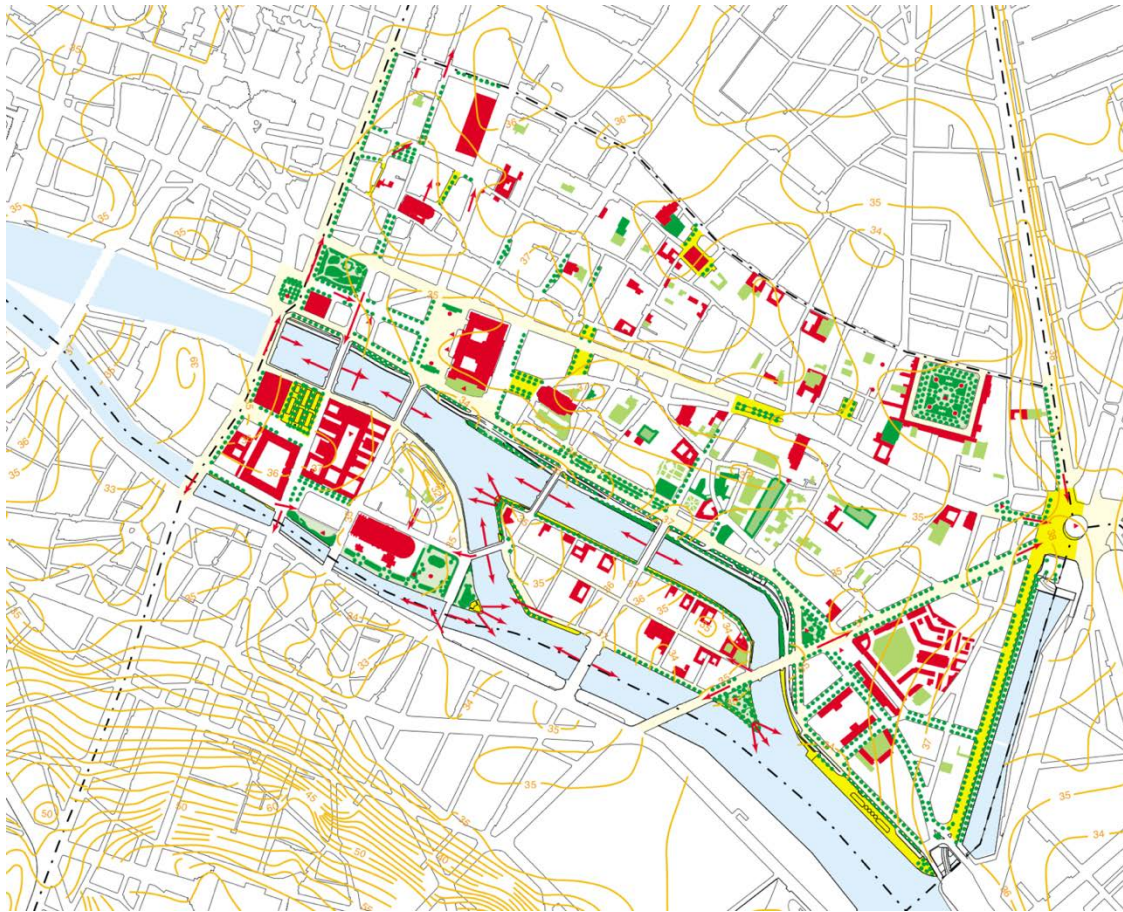
Paris 4th district has a high job/resident ratio. Most active population living there also work in this 160-ha district.

- Job/resident ratio: 1.47
- Ratio of number of jobs/active population¹¹ in the district: 2.77
- Percentage of active working population living in the 4th district that work in the district: 72.8%.
- Public transportation: seven subway lines
- Automobile equipment: 75% of households don't own a car

⁹ Active population having a job.

¹⁰ Data source: INSEE. <https://www.insee.fr/fr/statistiques/2011101?geo=COM-75056>

¹¹ Active population having a job.



Paris 4th district urban landscape. Source: APUR 2001.

The high job resident/ratio and the high availability of local jobs (almost three jobs per active working resident) ensures that about three quarters of the active population living in the district work in the district. Along with the excellent walkability provided by a highly connected and extensive public realm, this makes people move away from cars (three quarters of households don't own a car). People go to work using public transport (63%), walking and cycling (18.4%). Only 6.5% use a car¹².

HOW TO INCENTIVIZE MIXED-USE DEVELOPMENT

Economic densification and concentration of jobs in mixed use communities are crucial to agglomeration economies, productivity, and inclusiveness. UN Habitat recommends planning for at least 0.5 to 0.7 jobs per resident in any neighbourhood¹³. As shown by case studies in Paris, in districts offering many diverse jobs, residents don't make long commutes to reach employment. This has positive consequences on their quality of life due to short travel times and lower transport costs. For many activities, information

technology has also made working from home possible for more and more people.

Cross-cutting Strategies¹⁴

- **Zone for a diverse mix of land uses to enhance residents' access to neighbourhood assets.** Maximize proximity to jobs, schools, parks, retail, and community centres. Such proximity encourages walking, biking, and public transport.

¹² Data source: INSEE. <https://www.insee.fr/fr/statistiques/2011101?geo=COM-75104>

¹³ UN Habitat 2015.

¹⁴ Centre for Active design 2018.

- **Incentivize growth to fill gaps in neighbourhoods burdened with abandoned lots or high vacancy rates.** Explore incentives to stimulate new, mixed-use development in targeted areas.
- **Encourage diverse dwelling options.** A blend of market, affordable, and subsidized housing can stabilize neighbourhoods, support demographic and economic integration, and reduce zones of concentrated poverty.

Local authorities should link incentives to areas lacking certain amenities. Tools for attracting desired mixes and density include

- floor-area ratio bonuses.
- affordable housing bonuses.
- tax abatements for privileged uses, such as grocery stores or day-care centres.
- impact-based development fees.

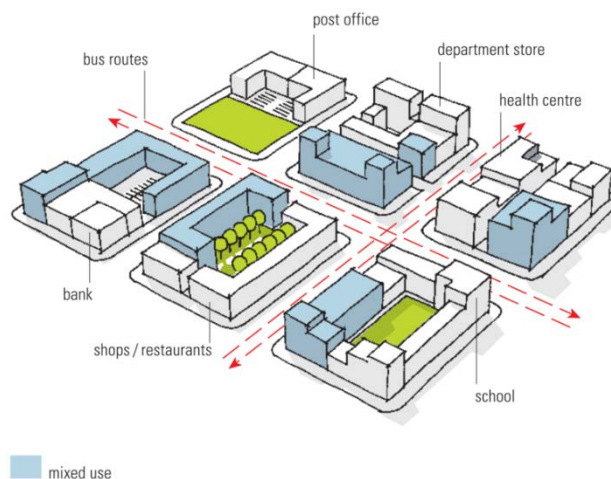
Governments should remove administrative barriers. Outdated zoning ordinances and building codes can discourage mixed use even if planning guidelines recommend it. Localities should update regulatory frameworks to attract the right mix of development. Local governments should make sure that zoning ordinances allow for mixed use and rezone certain developments to have more mixed-use areas.

HOW TO DIVERSIFY LAND USES

In any neighbourhood, economic use should occupy at least 40% of floor space. Single function blocks should cover less than 10%¹⁵.

Planners should design the mix of activities at a very fine spatial scale (200 m² plots) and within the same buildings whenever possible.

Mixed-use needs to be in the right place, with the good connections. It should allow all users to access and use the services. Flexibility must be integrated so that structures can adapt to changing economic conditions. These principles apply to different scales ranging from mixed-use buildings to neighbourhood centres.



Mixed-use diagram. Source: North Shore City 2005.

When planning for mixed use, a site analysis should examine if the services required by potential business and home occupants are available in the area. Such services include

- shops, banks, grocery stores.
- public transport.
- schools and healthcare facilities.
- open space/recreation areas.
- off-street and on-street parking.

¹⁵ UN Habitat 2015.

Concentrate and mix the uses to create a sense of place

Combining the principal activities of life and work supports a greater variety of secondary facilities (whether commercial, entertainment, recreation or community-based).

Diversity should be encouraged in

- built forms.
- land use.
- density.
- tenure.
- market segments.

Housing options should include diverse types and tenure to attract different kinds of households. The same is true for businesses and green spaces, schools and healthcare. Within each category, there needs to be a blend of sizes and activities. Most communities need a housing component to be safe and secure 24 hours a day. Other uses are layered on this dwellings base. Places with concentration of shopping, local services, commerce or recreation must also function as residential communities.

Communities should not be uniform

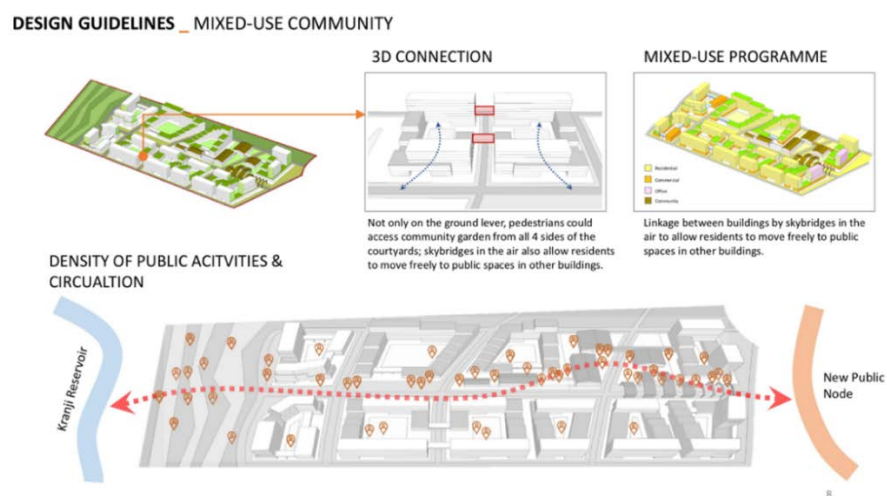
'Character areas' reinforce the local identity. It is possible to strengthen places where occupation is established on an activity (such as a market or university campus), or to design new areas of personality. Different spatial and economic conditions require adapted approaches. Some core neighbourhoods should concentrate fine grain and public transport connectivity in their centre. Some places are high diversification-potential transition zones between centre and edge.

The movement framework should be a key consideration

When planning new areas, uses that require the most footfall (such as retail) should be in the best-connected locations. Multi-use centres should be effortlessly accessible through a well-designed public realm. They should be¹⁶

- at intersections of movement lines or on a route to another destination.
- served by public transport.
- oriented towards the street or public space and visible from it.
- easy to reach and pleasant to use.
- next to community facilities.

An example is the mixed-use development strategy in Sungei Kadut project in Singapore presented below.



Mixed-use community guidelines for redevelopment in Sungei Kadut, Singapore.

¹⁶ English Partnerships and Housing Corporation 2007.

Concentrate the highest diversity of activity in the nodes of public transport

The size and intensity of development may vary according to the location within the public transport network.¹⁷ A high diversity of uses reinforces the neighbourhood identity. It captures passenger flows for supporting commercial growth¹⁸ and allows complete integration of bus stops and stations. Housing should be a key component of the mix. By injecting as many homes as possible, the activity can be stretched beyond office and shopping hours. To create a concentration, convenience stores, businesses and amenities, bus stops and a primary school are a minimum. Public services support residents and jobs. These central elements of the neighbourhood structure foster a strong sense of community and identity. Nurseries, elderly care, healthcare, libraries, community centres, police and fire stations, and government offices are best positioned at the central and highly visible points. Adding public squares can emphasize their civic status.

Build a multipurpose centre quickly

Empty premises should be avoided in the early stages. The number of opportunities available and accessible for occupants of a new development will increase their perception of the life quality offered by the place. An initial high-quality urban environment will enhance the value of properties. It can make the area a destination attracting visitors from outside such as King's Cross in London. These visitors will make mixed uses more and more profitable. To trigger a positive value appreciation cycle, the following must be considered.

- Establish community meeting places at the heart of the project, preferably at an early stage.
- Dwelling density must be appropriate to make mixed uses viable. Shops and services, for instance, require a sufficient population within five to ten-minute walk (400 to 800 metres).

- Residential zones can accommodate a large area of shops and local services. Every effort must be made to conserve as many of these uses as possible in the community. This can be facilitated by ensuring a high quality of services, of the built environment, and of public spaces.

While an initial financial assessment may suggest eliminating low- or non-revenue-generating uses to heighten profitability, some of these uses, such as convenience stores and cafes, enhance liveability, thus increasing the price of the properties. Capturing part of the value created across all neighbourhood properties can subsidize the cost of including small, low-rent commercial units, especially during the early years.

Link interrelated uses

Some uses rest on others. For example, a medical office can make a pharmacy viable or a primary school can attract a kindergarten. Developments may encourage a specialized group of independent but related activities, benefiting from close proximity or common facilities. Such uses can be stimulated by providing shared conveniences and the ability to interact.

The transition zones between centre and edge are a fertile land for mixing to occur

These areas bridge the commercial core and the residential developments. The most dynamic mix may occur there with shops, workspaces, storage and homes. Lower land values allow some of these uses to flourish and offer the greatest opportunity for encouraging densification and integration. Schools can be placed in the transition zone between densely populated residential areas and local centres. They will be as close as possible to the majority of children. They can be introduced without cutting off pedestrian access to the centre.

¹⁷ Salat and Ollivier 2017.

¹⁸ An example is thriving nodes along the Yamanote line in Tokyo (Salat and Ollivier 2017).

Curtail Monofunctional development at the urban edge and absorb it in the mix of uses

Monofunctional commercial developments (industrial, business, retail, leisure, office or science parks) are low-density clusters that, over the last years, have formed isolated zones at the urban edge of many cities. They are one of the most difficult challenges for urban designers seeking to create integrated mixed developments. When 'big boxes' or 'sheds' are already there, they should be transformed with a public facade and high-quality landscaping, with plans for future modernization and densification, particularly of their often-excessive parking areas. These commercial functions should be reintroduced into urban centres to become part of the urban mix. This has implications in terms of form, density and parking, especially regarding the adaptation of 'big box stores' (multiplexes, supermarkets or retail warehouses)¹⁹.

A preferred strategy is to absorb the 'big boxes' in mixed-use perimeter blocks. The presence of larger

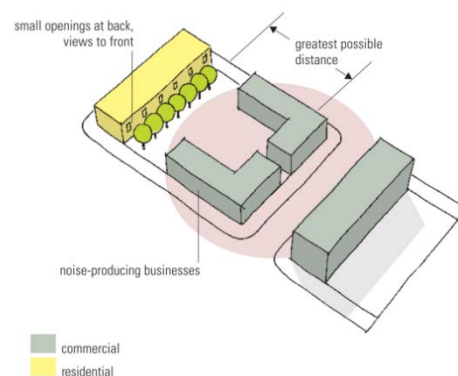
HOW TO DESIGN MIXED USE BLOCKS

Compatible uses should maximize synergy and minimize conflict. Most activities can coexist harmoniously. In many places, a blend of sights and sounds confers a unique character. When considering the broadest possible combination to add vitality, an economic feasibility study should verify viability. An assessment should check the uses' ability to work together with their neighbours. This will allow positioning each to avoid conflicts. Compatibility is essential to the success of a mixed-use scheme. The majority of business and commercial activity today is complementary with residential development. Such uses include shops, offices, cafes, restaurants, educational and institutional facilities, and services such as libraries, community centres and creches.

development blocks in these locations can provide enough ground to cover the box edge with a skin of smaller buildings, concealing its mass and creating an active facade and public space.

Department stores and other large 'big box' self-contained units should be designed internally with a micro-urbanism approach with linkages connecting to adjacent streets. These buildings types can be modified to become compatible with fine-grained urban environments. They can be layered horizontally and vertically with green spaces, such as sky gardens. Other uses addition may involve

- wrapping the perimeter of facades with smaller units.
- building other uses on the airspace above the box.
- externalize more active uses (such as cafes and shops) and increase their 'transparency' vis-à-vis the street.

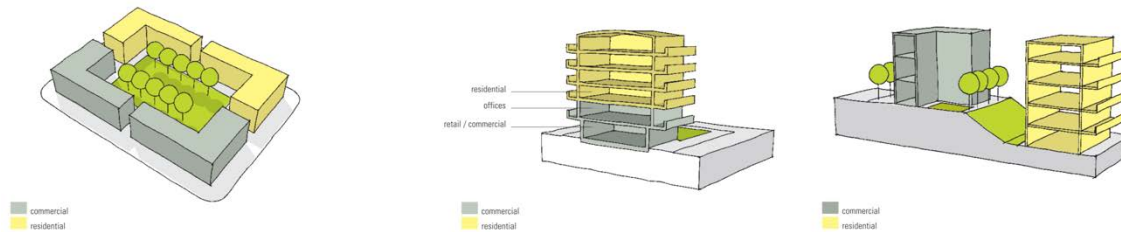


Physical distance may be employed as a buffer to protect residents from noise or disturbance. Source: North Shore City 2005.

¹⁹ The provision of such facilities must be adapted to the needs of the locality and must not impose socio-economic costs on the community in terms of traffic

generation, visual blight and undermining established centres.

Mixed-use can be arranged horizontally, vertically, or as a combination of the two within the same blocks or buildings.



Diagrams showing various layouts of mixed use. Left: horizontal mixed use. Middle: vertical mixed use. Right: combined. Source: North Shore City 2005.

▪ **Horizontal mixed use**

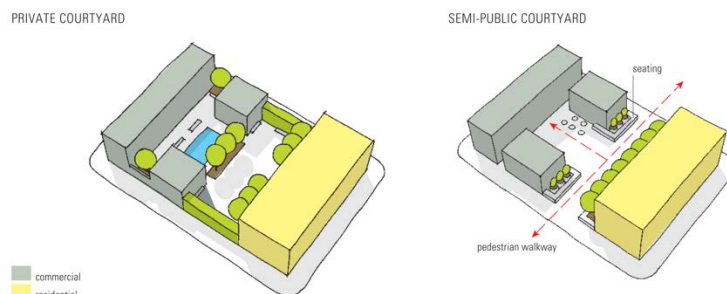
Where site size permits, a mixed-use development may be designed with exterior open spaces separating different uses. This is called horizontal mixed use. Techniques for achieving interoperability of use feature

- locating business uses facing the street and residences closer to the rear.
- using distance or buffers between disparate uses to protect inhabitants from unnecessary disturbance and to ensure privacy.
- including courtyards to provide a quiet outdoor area within the development.
- internal arrangement of buildings to ensure that neighbouring areas are compatible.

▪ **Vertical mixed use**

A mixed-use development may be organized vertically within a site. Techniques for ensuring compatibility of uses in such a development include

- locating one or more floors of offices directly above the ground floor to act as a buffer for upper residential floors.
- choosing structural solutions that eliminate noise transmission between tenancies, such as acoustically treating walls, floors and structure.



In mixed-use blocks, courtyards can provide either quiet/private areas or public/commercial spaces within a development. Source: North Shore City 2005.

HOW TO DESIGN BUILDINGS FOR MIXED USE

Modifying and reusing existing buildings is a sustainable and cost-effective development option. Existing buildings are part of the uniqueness of the area in which they are. Their conservation and reuse preserve the built memory of the community and greatly strengthen its sense of identity and place. Well-designed conversions can revitalize places by encouraging businesses and residents to return. The choice of new uses for adapted buildings is essential to the project success. They must respect the

neighbourhood history and its intended future character. These types of reuse schemes have become easier to manage and implement. They provide an opportunity to mix retail, commercial, and residential spaces, as many older buildings are constructed with high-quality materials and have generous floor-to-ceiling heights. Additionally, these buildings often have a modular structural frame and floor plans, both of which are readily adapted for commercial and residential use.



A restored granary building at the heart of King's Cross is now home to the world-famous arts college – Central Saint Martins. Photo: ©Françoise Labbé.

Buildings should be designed to evolve in space and over time: space in terms of integrating a mix of uses in close proximity; and time in letting them be adapted, personalized and transformed according to new needs²⁰. In neighbourhoods' cores, buildings should be mixed use in plan and section and be able to accommodate flexible occupancy conditions. This development is both sensitive to market and increases commercial value by creating a more diverse and stimulating place. Buildings designed for many usages will have a longer lifespan as they offer opportunities for progressive renewal. If flexible planning permissions are secured for these properties, the lifework designation can be sold as a positive attribute, and not as a constraint.

Lifework units that allow commercial or residential uses on the ground floor can manage mixed uses at a later stage. This avoids the risk that economic spaces on the ground floor remain empty. One solution is to develop town houses ground floors with planning permission for residential and professional use. The ground floor should be designed so that residential or commercial uses can be arranged in the same way. It will be able to shift to commercial use over time when the neighbourhood becomes established and footfall increases. Design considerations include²¹

- Design for ceiling heights higher than the minimum required to allow for future change of use.

²⁰ Llevelyn Davies 2000.

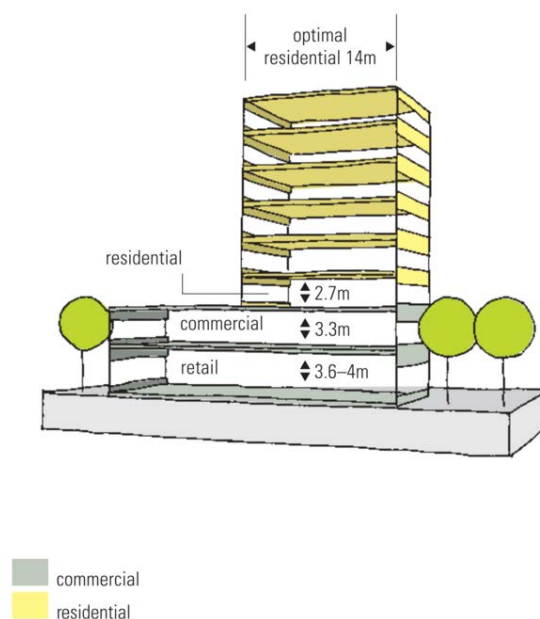
²¹ English Partnerships and Housing Corporation 2007.

- Floor to ceiling height above three metres at ground level.
- Generous unit sizes, with flexible floor plates.
- Building systems that allow later insertion of larger window and door openings.
- Threshold relationships that allow visual openness or privacy based on dominant usage.
- Provide separate entrances to ground and upper floors.
- Design building depth to between 10 and 14 metres to allow for commercial and/or residential uses while offering good vertical circulation, natural lighting and natural ventilation.
- Provide regular internal room layouts to ensure ease of construction and adaptation.

- Ensure floor areas of no less than 40m² for one-bedroom units and 55m² for two-bedroom apartments.

It is recommended to design with higher ceiling heights. Advantages of buildings with higher floor-to-ceiling height for all floors include

- Increased flexibility and adaptability.
- enhanced natural lighting due to higher window heads.
- good natural ventilation for the rooms that are furthest from the windows.
- generous, appealing interior spaces.
- improved sound insulation between floors.



Generous ceiling heights in commercial and residential spaces allow for flexible uses. Source: North Shore City 2005.

Designing for higher ceiling heights allows for maximum flexibility. This adaptability broadens the project's economic viability. Main recommendations are²²

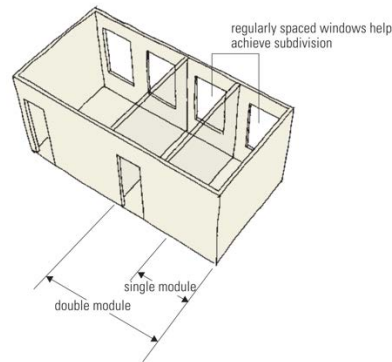
- design the ground floor of a mixed-use development to have a minimum floor-to-ceiling height of 3.5–4.0 metres to permit many uses.

²² Residential spaces are frequently planned with a floor-to-ceiling height of 2.4 metres or less. However, building ceiling heights to 2.7 metres can have significant advantages in flexibility of use. Commercial buildings have increased service requirements and

therefore will generally require minimum floor-to-underside-of-slab heights of 3.5 – 4.0 metres to achieve minimum ceiling heights of 2.7 metres.

- design all other floors to have minimum floor-to-ceiling heights of 2.7 metres to allow for both commercial and residential use.

It is recommended to use modular design. Medium-sized, modular rooms accommodate a varied range of activities. Such rooms may be subdivided by constructing new, non-load bearing separating walls, and may be enlarged by combining two or more rooms.



Creating standard size rooms of 13–14 m² allows interior spaces to be easily enlarged or subdivided.

Designers can ‘remix’ uses side-by-side. With the advent of clean technologies and the rise of the service sector, uses can again be ‘remixed’. Many traditional building forms lend themselves easily to conversion. Inherently flexible buildings will facilitate changes over time. Many historical precedents in cities like Paris or London are also informative. Strategies for mixing uses include

- inserting workspaces or compatible employment uses into block interiors.
- introducing lanes lined with offices, workshops or studios.
- ‘grading’ uses, for instance, from general industrial uses, through light industrial/workshops/offices to residential.
- creating hybrid building types that can serve as a buffer between different use areas.

- encouraging temporary uses such as small arts and crafts workshops or markets to bring life to an area until permanent accommodation has been constructed.

Even where ‘breathing space’ between uses is considered necessary, this can be treated positively with the insertion of a public square or park.

Designers can also stack up with vertical mixed use.

Flats or offices can often be accommodated over shops, restaurants, community or leisure uses. Innovative blocks insert vertically sky gardens and micro-urban linkages between stacked uses.

Flexible buildings offer occupants the ability to modify and personalize their homes and workplaces. They can be customized to suit preferences and usage transformations. This largely depends on the building layout (height, width and depth), access arrangements, the amount and configuration of the interior space and how thresholds are handled.

ENCOURAGE SUSTAINABLE LIFESTYLES

Our lifestyles have a profound effect on our planet, affecting how our cities and neighbourhoods are built, how our economies grow, the resources and energy they use, and how our environment is healthy. Society is beginning to understand the impact of our daily decisions. Carbon footprints and food waste reduction campaigns, urban gardening, vehicle sharing models encourage individuals to live more sustainably. Policy actions may guide people to these lifestyles²³. They are now firmly anchored in global policy. The Paris COP21 Agreement made it clear that sustainable consumption and production (SCP) will be essential in the fight against climate change.

A 'sustainable lifestyle' is facilitated by institutions, standards and infrastructure that frame individual choice. It minimizes the use of natural resources and the generation of waste, while promoting equity and prosperity for all. It recognizes the ecological and material limits to fulfil demands. Adopting sustainable lifestyles requires reshaping social norms and system design. It means rethinking the way we buy and organize our daily lives. It also has implications for how we socialize, exchange, share, educate and develop our identities so that societies are in balance with the natural environment. As citizens, at home and at work, the choices we make about food, housing, mobility, consumer goods, tourism, communication and interaction build sustainable lifestyles.

Planning and design should integrate lifestyles into core urban strategies to develop innovative ways to meet the needs of people while reducing the pressure on global resources. This may include real-time communication via ICT on impacts on the sustainability performance of the neighbourhood to improve informed individual decision-making. Community infrastructure shapes daily consumption. Inhabitants' behaviour is influenced by street networks and by the technology that provides water, energy, and waste management. Oversized roads or the lack of clean, safe, accessible and affordable public transport fosters the

use of other options such as private cars. Infrastructure has a long lifespan and locks residents into patterns. It's crucial to design it right from the start²⁴.

The way communities are built affects many aspects of society: the crime rate, commuting distances, opportunities for neighbours to bond and form vibrant societies, and the general well-being of inhabitants. Sustainable design fosters behavioural change. It creates a strong sense of belonging to a community, enhances the experience of people's everyday lives, increases safety and inclusiveness, and generates economic benefits. Sustainable infrastructure options should be comparable to existing ones in safety, quality, healthiness, accessibility and at a reasonable cost. Given its impact on behaviour and its duration, the design of neighbourhood infrastructure for housing and mobility is crucial for sustainability. Dwellings with automated motion detection switches, for instance, employ relatively less energy. Besides the characteristics of individual units, the configuration of communities influences sustainable living. For instance, zoning laws that foster the development of housing away from work and commercial premises encourage frequent travel.

- Education to sustainable lifestyles should start from the neighbourhood development process. Locating sustainability organizations on the site offers a focus for residents' participation.
- Low-carbon neighbourhoods should be inclusive. Kronsberg and Vauban, in Germany, for instance, have succeeded in providing 80% of the dwellings as affordable.
- High quality of life is achieved by the spatial organization, material and sensory richness, by ample public green space, by walkability, and by the variety of social interaction.

²³ UNEP 2016.

²⁴ Kivimaa & Mickwitz 2011; Sahakian and Steinberger 2011.

- Mixed use with shopping, schools, and social and recreational facilities, all within walking distance from housing, enhance interaction and safety. Healthcare, community centres, senior services, local libraries, all increase opportunities of social life. They build into residents a sense of belonging, that is the key to a sustainable and healthy life.

Attitudes are shaped by knowledge and value orientation. Communities need to appreciate what norms they promote and how they influence citizens' decisions. Households must understand the impacts of their choices, the potential alternatives available and recognize that answers – although difficult at the individual level – can contribute to the wider sustainability. Civil society organizations play a key role in raising awareness with platforms for association, and in ensuring acceptance and the continued generation of new solutions.

Facilitators are a set of instruments, such as regulation, legal platforms, administrative processes, market mechanisms or institutional arrangements that offer incentives or constraints for sustainable choices. Associations or schools validate standards and shape ways of thinking and acting. Thus, if they adopt sustainable principles, policies and practices, they can inform and encourage positive lifestyles. Price is also a good facilitator – affordable options are more attractive. Measures should target patterns that need change. What works for one group may affect another in a counterproductive way. For instance, increasing prices to reduce wasteful water intake could

disproportionately affect those who cannot afford it. The price difference may not be large enough to deter overconsumption behaviour.

Examples of neighbourhood level facilitators for sustainable lifestyles

- **Citizen panels on innovation**

A broad-based platform of citizens, consumers and organizations, public institutions, schools, etc. Such panels would co-create a shared vision of lifestyles in the neighbourhood, be engaged in problem diagnosis, deliberative policy formation, proposing solutions, and facilitation of buy-in from residents and stakeholders.

- **Ombudsman**

A body that would support sustainability considerations in public decisions and infrastructure, and foster initiatives by the citizen panel. Such an institution could work with banks and local organizations and communities to intervene against financial or lending schemes likely to cause personal, social and ecological distress.

- **Business hub**

A hub that could promote new models such as shared services, social enterprises, co-ops, repair and second-hand shops; address advertising and marketing, such as limiting ads targeted at children and schools; commercial or ad-free zones; using fact- and science-based claims; etc.

Nurturing ecological and social sustainability in eco – neighbourhoods

In Bo01, Malmö, initiatives included (1) a lecture programme; (2) the teaching of subjects concerning a sustainable society; (3) a programme for school children; and (4) a project that addressed the question, 'How should we live?'

In Hammarby Sjöstad, the on-site GlashusEtt facility carried on a series of activities.

In Kronsberg, the Kronsberg Environmental Liaison Agency (KUKA) promoted the community ecological development through public relations, guided tours, information, skill building, and training in ecological construction for contractors, and education for residents.

In Vauban, Forum Vauban organized the residents' involvement in the design. The Baugruppen self-building process engaged dwellers in the design and construction of their homes.

Children on bikes in Denmark



Denmark is a pioneer in promoting the bicycle as a means of transport by providing good cycling infrastructure.

Children should learn to cycle at an early age. This is the basis of a healthy, sustainable cycling culture. Denmark has a strong focus on cycle training and traffic safety on the part of parents, schools, day care institutions, and the authorities. The cycling campaigns of the Danish Cycling Federation promote everyday cycling in school and at work. The goal is to get more children to cycle to school routinely. The campaign started in 2002. Each year, approximately 120,000 to 150,000 children participate. The campaigns involve both infrastructure and design improvements and encouragement to behavioural change. The measures are often initiated in cooperation among schools, day care facilities, local authorities, and organizations with funding from various foundations. A good example is Trafik i børnehøjde (traffic for children), a holistic teaching concept that involves schoolchildren in improving traffic safety around their school. The state has set up a pooled fund to support local authority initiatives to make school routes safe.

What local governments do²⁵

- Ensure that all children can safely and securely walk or cycle to school and after-school activities, for example by means of dedicated cycling infrastructure along major roads, speed limits or no stopping in school zones.
- Draw up a municipal cycling policy and action plan.
- Ensure interdepartmental cooperation among the administrations in charge of health, children and young people, culture, and technology and the environment.
- Initiate fun activities for children, such as bicycle libraries where children can try out different types of bicycle.

What schools do²⁶

- Draw up a bicycle and traffic policy and establish an ongoing communication with teachers, parents, and children.

²⁵ Source: Danish Cyclists' Federation.

²⁶ Source: Danish Cyclists' Federation.

- Cooperate closely with parents to send the message that it's important that children can cycle, and organize bicycle busses conditions permitting.
- Integrate cycling in the school curriculum in the form of cycle tests, bicycle games and educational campaigns
- Implement initiatives that capture the children's interest in cycling.
- Ensure good bicycle parking facilities, preferably covered, and close to the school entrance.



Photo: Marie Hald

An example of Danish design initiative to promote children cycling is bicycle playgrounds and traffic playgrounds. Cycle training calls for good, traffic-free areas where small, new cyclists can romp freely as they acquire the necessary cycling skills. The bicycle playground, a playground dedicated to children on bicycles, is a well thought out response to the challenge, and was developed in the wake of the bicycle games concept. The bicycle playground should be distinguished from the traffic playground. The focus of the bicycle playground is on mastering cycling skills whereas the focus of the traffic playground is on learning the road rules. The bicycle playground is an inspiring route network with hills and obstacles and good free areas for fun and play. The idea has been implemented in a number of Danish cities as part of a larger project developed by Danish Cyclists' Federation and funded by the Nordea foundation. Traffic playgrounds are another key, traditional Danish concept. Like the bicycle playground, the traffic playgrounds provide a traffic-safe area where children can develop skills through play. The focus of the traffic playground is traffic structure and road rules. The playground imitates real traffic with roads, intersections, signage, markings and traffic lights, and creates a concrete framework for traffic training where children can visualize themselves as a driver, a cyclist or a pedestrian²⁷.

²⁷ Source: Danish Cyclists' Federation.

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