

Food growing in our towns and cities

A playbook for food and masterplanning

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Foreword

Food should return to the heart of urban development

Food has always been central to the way we live and the way our communities develop. As cities densify it is ever more critical that we use urban territory in the most beneficial and responsible way possible.

There is increasing awareness of the direct relationship between diet, the growing of food and well-being. It is also widely understood that local food growing can address multiple aspects of sustainability: environmental, social and economic. All of these have the potential to help tackle the climate crisis, strengthening long-term, local resilience.

We believe that integrating food into urban projects – whether in new or growing, densifying neighbourhoods – increases the health of both people and the planet in a variety of ways.

Who is this guide for?

Although we initially developed this toolkit for our own teams, to share knowledge and best practice, ultimately it has been created to help our clients and the wider community to understand the potential and the practicalities of urban agriculture. If you work in urban planning, food retail, agriculture, residential/mixed-use development, we believe this guide can inspire innovative thinking and practices.

We look at what we can learn from a real-world case study, a community garden developed in Ontario, California, USA. We have then applied our research and KPIs to demonstrate just how practical and cost-effective urban farm development can be.

We hope this document helps colleagues, clients and peers across urban development to ask the right questions to ask when commencing a project. At Arup we believe urban design and masterplanning process gain greatly when food and agriculture are central parts of the design.



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Context

Food is the strongest lever for human health and environmental sustainability on our planet. With that in mind, we need to explore how we can expand and embed food growing throughout our human and social environment.



How urban food growing leads to a healthier planet

15-20% of world's food supply is produced from urban farming. [1]

30% increase happened in urban farming over the past decade globally. [2]

85% of cities' fresh vegetable needs are provided by urban farming in some countries. [3]

1,000-15,000 jobs have been created through urban farming in various urban centres around the world. [4]

2°C reduction in urban heat islands can be achieved through urban farming [5]

Key drivers for urban food growing

1. **Sustainability:** The local growing of food promotes sustainability in multiple ways, including the reduction of food transport, recycling and upcycling, permeable land coverage and respect for local climatic conditions.
2. **Social Cohesion:** Urban agriculture can provide educational opportunities and a sense of the collective. This ultimately fosters more sustainable and resilient communities while promoting social equity and improving the quality of life.
3. **Health and Wellbeing:** Local food growing strengthens the connection between food and city dwellers. Food growing environments allow people to make healthy food choices and encourages time outdoors engaging in physical activity and with nature. Locally produced food is fresher and healthier than store bought.
4. **Placemaking:** Urban agriculture can deliver well-rounded and attractive places. Urban farming can serve as focal points for placemaking efforts, providing a gathering place for neighbours to work together and build community.
5. **Public / private sector:** For many of our public sector clients, urban regeneration is a key focus as they look to revitalise inner city neighbourhoods and town centres. Developers are increasingly interested in delivering schemes with long-term appeal; urban agriculture is gaining traction as a tool to deliver more healthy and attractive places.

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ARUP

About our toolkit

Toolkit content and use

To help both our own practitioners and clients adopt the practice more widely, we have developed a standardised approach to the development of urban farming within the wider masterplanning process. Here are the high-level steps:

1. Identify opportunities

The contents of the Playbook offer a range of resources, including case studies, best practice examples, KPIs and design guidelines.

Some of the key themes we address include community engagement, environmental sustainability and economic viability.

Before exploring the Playbook content, identify the type of urban food growing you would like to explore for your project.



2. Explore KPI List

We identified a set of performance indicators in order to effectively analyse and evaluate each typology, and their relative strengths, and their respective case studies. We provided a KPI Framework including **25 KPIs** to provide a more streamlined process for masterplanners to choose the relevant typology based on their specific needs.



3. Select typology

We provided **6 typologies** allow masterplanners to design their projects across scales.

1. Private Food Growing
2. Mobile Garden
3. Edible Landscape
4. Rooftop Garden
5. Community Garden
6. Market Garden

4. Understand precedents

Our insights are based on **30 case studies** across a range of scales and geographies for each typology to provide designers with best practice examples. We analysed them by incorporating KPIs.



5. Develop design

Finally, the Playbook allows masterplanners to incorporate productive food growing into the design of their project.

KPI Framework

The KPI parameters were chosen for their crucial link to the success of urban agriculture initiatives, as well as being closely tied to the overall goals of sustainability, resilience, and equity.

1 Food and Dietary Needs

KPI	UNIT
Food Growing Area Ratio	Percentage %
Total Open Space:	Area (m ²)
Total Food Growing Area:	Area (m ²)

2 Spatial Context

KPI	UNIT
Adjacencies	(within 2km radius - 15 min. walk)
Commercial functions	Number of buildings
Community functions	Number of buildings
Maintenance	Area (m ²)
Total technical area	(typical dimensions)
Replicability & Scalability	Score based
List of characteristics	high medium low
Access	Score based
Controlled, open, or authorized.	high medium low
Assets	Score based
Does it offer bare min, or something more?	high medium low
Distance	
to residential area:	meter
to market:	meter
to educational facilities:	meter
to biodiversity & habitat	meter

3 Benefits

KPI	UNIT
Environmental	Score based
List of activities (sustainability, resilience, circular economy, NbS, etc.)	high medium low
Educational	Score based
List of activities	high medium low
Economic	Score based
List of activities	high medium low
Social	
Regeneration of place and identity	Score based high medium low
Social Cohesion & Equity	Score based high medium low
Health & Wellbeing	Score based high medium low
Security and Safety in Access	Score based high medium low

4 Management and Cost

KPI	UNIT
Strength & Robustness of Governance Structure	Score based
The characteristics of partnerships	high medium low
Management Entity	Score based
The characteristics of land ownership	public semi public private
The characteristics of food growing area management	public semi public private
Longevity	Score based
Lifespan of project - How many year/month?	high medium low
Cost	
Initial investment	Score based
- Is it done?, if so, how much?	yes no
Staff	Score based
- Was it covered by volunteers?	yes no

Locations, possibilities, typologies

Given our chosen key performance indicators, we arrive at the following six common possibilities for urban food development. These span the range of practical ways food’s value in the urban community can be realised for the community. For masterplanners, these six options are helpful entry points and a way to make urban food growing a business-as-usual consideration in their work.

DESIRED OUTCOMES

- 1. Food growing with commercial purposes → **1. Market Garden** (Orchard, Vineyard, Greenhouse)
- 2. Transforming flora to edible plants → **2. Edible Landscape** (Pocket garden, Edible boulevard)
- 3. Farming in private areas with limited access → **3. Private Food Growing** (Backyard Garden, Balcony Garden)
- 4. Farming activities at building scale → **4. Rooftop Garden** (Accessible roofs, top level of Carparking)
- 5. Modular and temporary food growing areas → **5. Mobile Garden** (Temporal land use, Prototyping, Modularity)
- 6. Local community managed food growing → **6. Community Garden** (Farming activities by volunteers)

Case Study

Community Garden: Huerta del Valle Community Garden, Ontario, CA / United States



Source: <https://californiafarmstourism.com/ontario/bowers/huerta-del-valle/>



Source: <https://foursquare.com>



PROJECT DESCRIPTION

A nonprofit grassroots organization serving a region of Southern California. They help people learn about food access, nutrition, sustainability and more, whilst actively practicing their solutions and growing their own food.



FOOD & DIETARY NEEDS

Total open space ~15.000 m²
Total food growing area ~9.000 m²
Food growing area ratio ~60%

*Based on Google Earth



SPATIAL CONTEXT

Adjacency

Commercial functions

Commercial shops, supply chain logistics warehouse, industrial area.

Community functions

Community centre, food distribution centre.

Maintenance

Technical functions

Water storage, compost piles and vermiculture boxes, storage, two greenhouses, utilities area

Distance

To residential area

30 m.

To market

800 m.

To educational facilities

650 m.

To biodiversity & habitat

50 m.

(within 2km radius - 15 min. walk)

60 - 70

20 - 30

~1000 m²

Access

Characteristics

Open to members; controlled access for the community. Vehicular access through the garden.



Replicability & Scalability

Characteristics

One of their core aims is to develop replicable local practices for economic and environmental justice.



Assets

Functions

A farm stand, an educational area, community space for events, long tables for socializing.



*Links: [6] [7] [8] [9]

Cont'd

Community Garden: Huerta del Valle Community Garden, Ontario, CA / United States



BENEFITS

Environmental

Characteristics

Four rotating compost piles providing fertile soil year-round, and there is a hoophouse with six large boxes ready to become vermiculture boxes in the spring, edible vegetative buffer.



Educational

Characteristics

'Abejas program' related to social justice, ecology and wellbeing. 'The Pitzer in Ontario program' academic immersion. Small area for future educational programs for community. New Farmer Training Program.



Economical

Characteristics

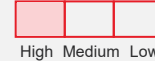
Access to a farmers' market, a farm stand; 'harvest box' subscription (subscribe to produce deliveries from the farm); online shop.



Social

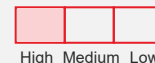
Regeneration of Place and Identity

Situated in a neglected landscape, it was built from the ground up, with the help of local residents. Brings a vibrant, sustainable model to this area of suburban sprawl.



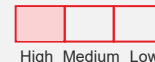
Social Cohesion and Equity

Provide access to affordable, organic produce for all to access through open markets on site, and create agricultural careers and leadership opportunities for adults and youth.



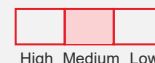
Health and Wellbeing

Run workshops on healthy eating, fresh produce and nutrition. Sense of community benefits mental wellbeing.



Security and Safety in Access

Perimeter fence, 20' (6m.) wide fire lane, and emergency exit.

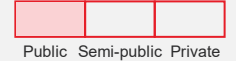


MANAGEMENT & COST

Management Types

Land Management

Land leased from City of Ontario Planning Department.



Food growing area management

Huerta del Valle Member Committee



Strength & Robustness of Governance Structure

Characteristics

NPO partnered with a College, previous relationship with Ontario Ministries



Longevity

Lifespan of the project

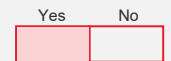
Permanent, since 2021



Cost

Initial Investment

\$67,000 grant over first 3 years



Staff

Paid and voluntary staff

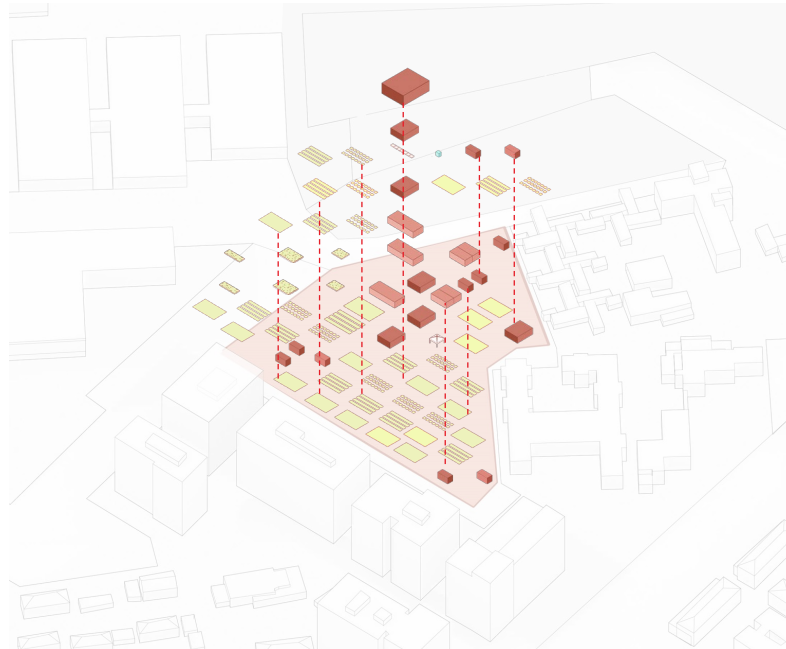
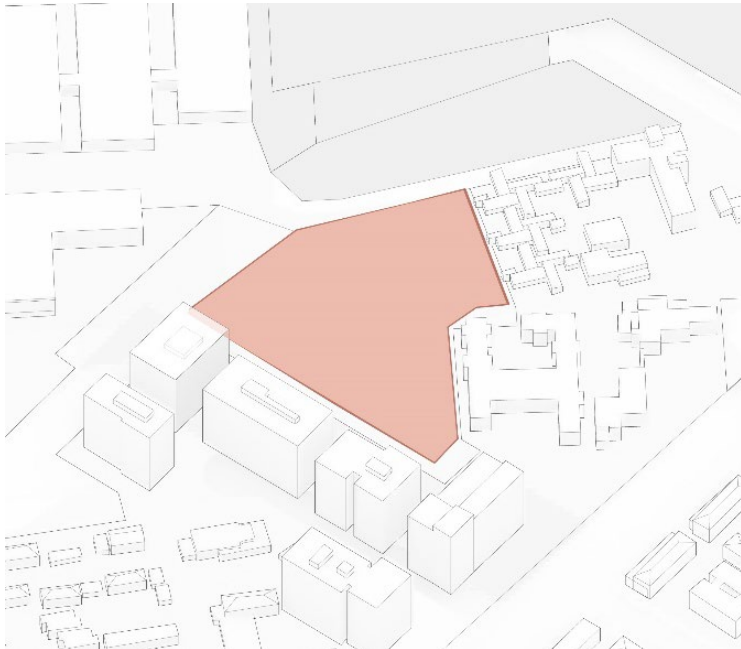


Masterplan demonstrator

Urban farming needs to be developed in a way that takes maximum advantage given local factors and constraints. We have created a flexible 'toolkit' for each typology that serves as a starting point for designers, specifying dimensions of food growth areas, maintenance requirements, and other optional elements which can add to the user experience.

From available site identified within a development...

To productive food growing complementing the masterplan



Insights

One big idea, many forms

We believe that there is a size and type of food growing that is a good fit for every neighbourhood or district development or redevelopment. Ultimately, we believe urban farming enhances collective and civic spaces and could rekindle a long-long lost connection between urban and rural communities.

The actual space for growing can scale up or down – it may occupy a full urban block or the equivalent of a single land parcel for a couple of houses. It can also occupy what might otherwise be residual land in a masterplanned development.

Local authorities are increasingly requiring evidence that developers are providing tangible benefits to existing communities that may be affected by new development. Accommodating food growing provides an amenity that can be enjoyed by both current and new residents, indeed, promoting cohesion between the two. Notably the management and costs associated with urban food growing can be very low. Our research indicates that as a little as £1,000 can kick-start a project. Indeed, there are many management models, from volunteers to paid local champions to external entities.



Get involved

If this is an idea that inspires you, please contact our team to learn more about how urban farming can benefit your project.

Contact our team:
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Read more:
[How can urban farming improve city life?](#)

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