Food-sensitive planning and urban design

A conceptual framework for achieving a sustainable and healthy food system

Heart Foundation

VEIL | victorian eco innovation lab

VicHealth

Authors: Jenny Donovan*, Kirsten Larsen* and Julie-Anne McWhinnie*

Contact:

Jenny Donovan
David Lock Associates (Aust)
+61 3 9682 8568
jennyd@dlaaust.com

Kirsten Larsen
Victorian Eco-Innovation Lab
University of Melbourne
+61 3 8344 9189
0425 794 848
klarsen@unimelb.edu.au

Heart Foundation (Victoria)
+61 3 9321 5400
activeliving.vic@
heartfoundation.org.au

Food-sensitive planning and urban design

Foreword

This document asserts that our cities need a new agenda of ideas and initiatives to create better, more sustainable places to live.

Most publications addressing how we should plan and design our cities start from the premise that there is much wrong with our cities. They point out that the way we organise space requires an increasing reliance on the motor car, consumes more land on the edges and demands more and more energy – all part of a road to ruin. Predictions about the increasing numbers of people who will live in cities add to the growing chorus insisting on the need for new directions and innovative solutions.

Food-sensitive planning and urban design does not simply assert that we have a problem in our cities, but sets out to identify new ways of tackling issues, providing a suite of ideas and innovations that cities should now embrace. It tackles a topic that has little precedent as an agenda for the planning of cities in Australia. It also sets out a host of reasons why we should add food to the core elements of the planning and design of our urban areas. This approach will not only improve the liveability of our cities, but will also deliver

a more sustainable food system. This resource goes beyond advocacy and assertion: it provides practical examples of what could and should be done to make our cities more food productive, healthier, better and more equitable places to live.

Through their collection of ideas and their call for a new agenda in the planning and design of our cities, the authors have sought to bridge a gap: a gap which exists between the current planning of our cities and the need for better and more sustainable food systems. Food should be on the urban planning and design menu. This resource outlines how consideration of food in planning and urban design can improve food systems and contribute to other aspirations of planning and urban design.

Food – how it is produced, secured, transported, processed, marketed, accessed, regulated, consumed and wasted, its contribution to the economy and jobs, and what it does to our

bodies and the planet – is now a major issue for households, communities, cities and regions. Food production is increasingly dependent on scarcer and costlier water supplies, and on finite resources, such as fossil fuels and productive agricultural land in and around our cities. Food has now become central to addressing climate change and sustainability. However, for those who do not grow it, food is usually viewed as a commodity that is always there. Food comes on shelves at supermarkets, over the counter at take-away food outlets, or is served at restaurants. There is now a massive disconnect between where and how our food is grown and the way we live our lives in cities. *Food-sensitive planning and urban design* advocates for us to get in much better touch with the most basic of human needs and to once again make food production and improved access to it part of urban living.

Our current formal system of planning originated in the overcrowded cities of the nineteenth century, where the industrial revolution produced unhealthy places. Concerns about the health of residents were a major driving force in the development of improvements in urban design and regulation of land use and development. Ironically, again, concerns about the health and sustainability of our cities are driving calls to rediscover the local food system and to create residential environments more in touch with food – where everyone can access food and places to readily obtain fresh, healthy food. A 2005 edition of the UK-based journal *Architectural Design* (vol. 75, no. 3) was devoted to the topic 'Food and the City'. Helen Castles in the editorial to that issue wrote, "if clean drinking water and public sanitation were the main obstacles to social progress in the 19th century city, a healthy diet and access to fresh food for all promises to be one of the hottest issues for the 21st century"[1]. In that same publication, guest editor Karen Frank observed, 'it is time for the architectural and urban design planning professions to support and enhance the city's multiple functions as dining room, market and farm'.

Similar calls are beginning to be heard here in Victoria. The May 2010 report of the Outer Suburban/Interface Services and Development Committee of the Victorian Parliament Inquiry into Sustainable Development of Agribusiness in Outer Suburban Melbourne noted that there was growing evidence "on the need to incorporate food production and distribution within the planning of urban communities. Typically, food has not been an area of interest for urban planning, **nor** has food been considered within metropolitan strategies."[2] In a report prepared for the Growth Areas Authority in March 2008, *A Strategic Framework for Creating Liveable New Communities*, Sue West and Marnie Badham identified that access to affordable food is now a priority in building new communities and that people need the opportunity to shop locally for fresh fruit and vegetables… and to grow, produce and sell local foods."[3]

The formal recognition that food needs to be on the agenda when we plan and design our cities is gathering momentum both in Australia and overseas. *Food-sensitive planning and urban design* is not only timely, but needs to be in the toolkit of every planner and urban designer who cares about the future of our cities and wants to be part of making better cities. Getting buy-in on having food as a core strategic element by those who run the planning system is a bigger task. This resource may well be seen in the future as a key element in getting to that goal.

Trevor Budge
Convener
Community Planning and Development Program
La Trobe University, Bendigo

Contents

How to use this resource

This resource lays out a framework of ideas for consideration by all those who collectively forge our cities and towns, so that we can begin to develop a shared understanding of what 'food-sensitive planning and urban design' (FSPUD) is, and the contribution it can make to the liveability and sustainability of our cities and towns. It has been developed with particular reference to the planning context in Victoria, yet this does not preclude its use by those in other states and territories.

Food-sensitive planning and urban design is written for a diverse audience, including planners, architects, urban designers, engineers, policy makers, community members and elected representatives. Each of these groups has valuable perspectives about the development process, but differing levels of experience with food and planning. They will also have different needs or uses for this work.

Given this diversity, the resource is laid out as a manual, with clearly demarcated sections that can be 'dipped into' to provide ideas or supporting arguments as needed. It can also be read from beginning to end, depending on the interests and time resources of the reader.

Section 1 sets the scene. It introduces the food system and some basic concepts and ideas about how planning and the food system interact. It also provides some insights into the issues that make planning for food a pressing issue, and outlines some barriers to prioritising food in contemporary planning practice.

Section 2 describes FSPUD. It outlines the concept of FSPUD and suggests a series of principles to guide its application. It also introduces the FSPUD matrix – a tool for relating the stages of the food system to the objectives of planning and urban design.

Section 3 provides tangible examples of FSPUD, by identifying a broad range of activities and diverse opportunities using the FSPUD matrix. In doing so, it suggests what communities and environments that reflect FSPUD principles would look like, and provides some accessible interventions that the reader may wish to consider.

Section 4 outlines ways FSPUD can be put into practice at the different stages in the planning process, and provides some pointers as to how interested parties can cultivate an interest in planning for food among their colleagues and peers.

Section 5 offers a series of case studies and precedents to illuminate some of the possibilities that arise from considering food in planning and urban design. This is not intended to be a comprehensive set of examples. There are hundreds of inspiring and creative examples of how people are using food to reinvent their living spaces and communities, and only a limited number could be included here. Instead, this section is intended to inspire and challenge the reader to consider what might be achievable.

Food-sensitive planning and urban design is intended to provide a catalyst for further discussion and to facilitate cross-fertilisation of ideas – leading to the development of new ideas and actions. It can also be used as a tool to advocate for change. It draws on insights from academia, governance and practice in the disciplines of planning, urban design, sustainability and health. While this resource does not intend to provide definitive answers about how food can be woven into every planning decision, it does provide directions worthy of investigation. The focus is particularly on urban areas (including regional urban areas), and their relationship with their hinterlands, because these are areas of both high tension and opportunity. Broader regional and rural land use issues are touched upon, but are not the focus, of this resource.

Section 1. Introduction

Food is a basic human need. This resource has been prepared to consider how the traditional concerns of planning and urban design can be reconciled with the imperative to make sure that everyone has access to adequate, nutritious, safe and tasty food, now and in the future.

This work builds on the healthy built environment focus that the Heart Foundation has pioneered over the past 15 years[4] and the concept 'food-sensitive urban design' coined and articulated by VEIL in 2008.[*]

FSPUD is an approach to planning and urban design that explicitly addresses the way food is produced, moved, processed and consumed, to create places that make it easy for people to meet their food needs. FSPUD also considers how meeting food needs can contribute to other objectives of planning and urban design, classified in this resource as:

• health and fairness
• sustainability and resilience
• livelihoods and opportunity
• community and amenity.

---

[*] Drawing on VEIL's work in sustainable urban systems, Kirsten Larsen outlined the need and opportunities for integrating food into sustainable urban developments and suggested some preliminary definitions and principles to shape the idea of Food Sensitive Urban Design.[5]

[†] Adapted from the definition of a 'sustainable food system' provided by APHA (2007).[6]

What do we mean by 'Food'?

For the purposes of this resource, we capitalise the word Food to refer to an aspirational subset of food that is:[†]

• required for a healthy and nutritious diet, and is adequate, safe, culturally appropriate and tasty
• produced, processed, transported, marketed and sold without adverse environmental impacts, and that contributes to healthy soils and waterways, clean air and biodiversity
• provided through means that are humane and just, with adequate attention to the needs of farmers and other workers, consumers and communities.

When the term 'food' is used without capitalisation, it means all food and food products and refers to a more general description, e.g. the current food system.

Planning and Food

The *Planning and Environment Act 1987* provides the legislative basis for planning in Victoria. It states that the purpose of the Act is "to establish a framework for planning the use, development and protection of land in Victoria in the present and long term interests of all Victorians".[7]

The *State Planning Policy Framework* seeks to "ensure that the objectives of planning in Victoria (as set out in Section 4 of the *Planning and Environment Act 1987*) are fostered through appropriate land use and development planning policies and practices which integrate relevant environmental, social and economic factors in the interests of net community benefit and sustainable development."[*]

Provision of Food is a central concern to ensure net community benefit and sustainable development, particularly in relation to the present and long-term interests of Victorians. This framework provides the basis – perhaps an imperative – for consideration of Food in planning and urban design.

The food system

The American Planning Association defines food systems as "the chain of activities beginning with the production of food and moving on to include the processing, distributing, wholesaling, retailing and consumption of food and eventually the disposal of waste". Each stage in the process has land use implications that require appropriate and adequate land. Planning frameworks and decisions therefore influence each of the four key stages in the food system, as outlined below.

1. **Producing food.** This typically occurs on land dedicated solely to the purpose of producing food. Food production in Australia often makes use of large areas of continuous land in regional areas to increase economies of scale with the intention of increasing efficiency. Land productivity (and viability for food production) is determined by many factors, including availability and quality of labour, soil, water, nutrients and energy sources, and diversity of plant species.

2. **Processing and transporting food.** This typically requires extensive infrastructure to facilitate treatment systems and transport, often requiring significant inputs of water, materials (e.g. for packaging), labour and energy. Some of this infrastructure is dedicated solely to supporting the food system (e.g. rail freight lines from high grain-producing areas). Access to suitable land and resources for production and other supply chain functions has a strong influence on where food processing occurs. The integrated nature of modern economies, and readily available and inexpensive fossil fuels, have enabled transportation infrastructure to support widespread movement of food around the world, enabling some communities to access the cheapest food from the global market.

3. **Consumer access and utilisation.** Like many countries throughout the world, Australia has experienced a trend towards urbanisation, which means many people are both physically and culturally separated from the sources of their food. Most Australians – including those in regional and farming communities – get their food from supermarkets and outlets (eating-out venues) and are eating more highly processed foods. 'Food deserts' (areas of limited or no access to food within walking distance of where people live or work) can exist even in dense urban areas or outer suburban expanses. Food access and utilisation also requires people to have spaces to store and prepare food, as well as the interest and ability to do so.

4. **Waste, re-use and post-use management.** A lot of food is wasted at every stage of the food supply chain. Post-consumption waste is typically dealt with in facilities committed solely to that function: sewage farms, land-fill, incinerators, etc. As food waste – along with many wastes along the supply chain – is organic, it can be treated and used to produce both energy and fertilisers (compost). However, these facilities are often not welcomed near urban areas and the costs of moving the product can be prohibitive – making it difficult for producers to access it.

_____

* clause 10.02[8]

Our collective ability to fulfill any of these tasks is dependent on making sure the environment within which they occur is ecologically healthy. The food system is fundamentally reliant on healthy soils and river systems, insects for pollination, and pest management, which are in turn supported by healthy native vegetation and biodiversity.

Problems in the food system today

For many people in Australia, food consumption is contributing to alarmingly high levels of disease such as cardiovascular disease and cancer.[9] Risk factors, such as obesity, high cholesterol levels and hypertension (high blood pressure), that contribute to chronic disease are increased by high intakes of total kilojoules (energy), saturated fat and salt, and low fruit and vegetable intake. Easy access to healthy food choices where people live, work and play is important to help maintain health and prevent chronic disease. Access to healthy foods is more difficult when areas have a low range of healthy and affordable foods available via food retail and food-service outlets. Food insecurity – lack of regular access to safe, nutritionally adequate, culturally acceptable food from non-emergency sources[10] – appears to be increasing: 53 out of 79 Victorian local government areas have reported that one in 20 of their residents ran out of food in the previous 12 months and could not afford to buy more.[11] The design of our cities and towns, and specifically enabling Food provision and access, is an issue that planners and urban designers can positively influence.

Disparities in income, transport, physical access to retail outlets, and varying levels of retail outlet exposure may make it difficult for some people to easily access Food and stay healthy. One Victorian study showed that increased variety of fast food outlets within a 3 km road network distance from individual respondent's homes is linked with likely purchasing of fast food.[*] A survey of 19 Melbourne local government authorities showed that people in low and middle socioeconomic areas were more likely to be exposed to fast food outlets than those in high socioeconomic areas.[†] In terms of store proximity (distance from residents' homes to the nearest store), advantaged neighbourhoods in Melbourne have been shown to have a shorter travelling distance to the nearest supermarket or fruit and vegetable store compared with disadvantaged areas.[‡]

In terms of store density, advantaged neighbourhoods were shown to have a greater number of supermarkets and fruit and vegetable stores within a 2 km buffer zone from home.[14]

Low-density urban expansion can result in communities with limited financial resources being dependent on cars or longer travel times to access Food. The increasing costs of transport, particularly for those in fringe suburbs experiencing financial hardship, can exacerbate this situation.[15] These factors can contribute to locking people into a cycle of deprivation and so compound their disadvantage.

The production, distribution and consumption of food all make a significant contribution to our environmental impact. The impacts of the food system are usually considered within regional landscapes and waterways, but these implications flow through into the food we eat. While less tangible to urban households than direct electricity and water use, their impacts are much greater. For example:
- 50% of a household's water use is contained in the food its inhabitants consume, compared to 11% directly used in the house and garden[16]
- 28% of household greenhouse gas emissions are from food – compared to 20% from direct household energy use (e.g. lighting, heating, cooling), and 10% from transport (not including emissions from food storage or preparation, or transport to access food)[17]
- over 40% of household residual rubbish sent to landfill in Melbourne is food organics.[§]

A more detailed investigation of the problems in the food system today can be found in Appendix 1.

---

* This was a multilevel cross-sectional analysis of 2547 individuals from 49 census collector districts in Melbourne, looking at total number and variety of fast food chain outlets (including Red Rooster, McDonald's, KFC, Hungry Jacks and Pizza Hut) within 3 km of the respondent's road network distance.[12]

† A total of 4913 residents in 50 small areas across 19 local government areas of Melbourne were surveyed.[13]

‡ Food store locations, food variety and price within stores were compared across 45 Melbourne neighbourhoods of varying socioeconomic disadvantage.[14]

§ Derived from audits of household residual (rubbish) bins conducted by a number of Melbourne councils between 2006 and 2008. Industrial food waste contributes 21% of the waste to landfill in Victoria (852,000 tonnes in 2006–07). Avoiding, recovering and reprocessing this material (rather than landfilling) provides a significant greenhouse gas reduction benefit, in the order of 300–500 kg of CO_2-equivalent per tonne of organics recovered.[18]

Emerging issues with the food system

Intensifying drivers of change are compounding these problems. Four key areas – climate change, vulnerability to peak oil, loss of land and resource scarcity – are outlined below.

Climate change

Australia's climate is changing due to greenhouse gases that are already in the atmosphere[19], and projected impacts up to 2030 are considered unavoidable. Global greenhouse gas emissions have been increasing at a rate higher than the worst-case scenario (no action) projected by the International Panel on Climate Change (IPCC) in 2000. This is likely to mean that the projected impacts of climate change are conservative[20]. Food production is already being significantly affected by climate change, particularly through reduced and unpredictable rainfall, increasing temperatures and heatwaves, and extreme weather events (including wind, frosts and hailstorms).[21,22,23]

Vulnerability to peak oil

The cost and availability of fossil fuels are critical to the food system, through direct use of fuel on farms, dependence on fossil fuels in the manufacture of fertilisers and agricultural chemicals, and in the distribution of food, including both movement of food through supply chains and how consumers access their food. An imminent global oil-supply crunch and continued price volatility will present significant challenges to many existing businesses and consumers,

and will require significant changes to food production and supply chains. Implications could include local suppliers becoming more competitive as fuel prices increase, and a need to re-evaluate 'just-in-time'* supply chains.[24]

Loss of land

Agriculturally productive land is coming under increasing pressure from competing uses, particularly to accommodate growing urban populations.[25] The conversion of high-quality agricultural land (typically near cities) to urban use increases the dependence on less productive land for food production and increases transport distances.

Resource scarcity

Our food system is also grappling with scarcity and/or cost of critical resources, such as water, energy and non-renewable sources of agrochemicals and fertiliser. The decline and degradation of these critical resources is being recognised globally as the major challenge to equitable provision of adequate Food to growing populations.

These trends are examined in more detail in Appendix 2.

_____

* Just-in-time supply chains are those where stock is ordered and delivered as it is required, rather than keeping additional stock on the premises.

However, it is in this context that a new role for our cities is emerging. The planning of cities and towns provides a concentration of critical resources that are needed to provide food (particularly water, nutrients and labour). Many of these resources are typically either not recognised or are considered as waste and removed as quickly as possible (e.g. stormwater, greywater, organic wastes and sewage).

Food production is heavily dependent on a range of agrochemicals[26] that are vulnerable to resource depletion, particularly nitrogen (derived using natural gas) and phosphorous fertilisers. Urban organic wastes from cities could contribute new fertiliser sources.[27,28,29]

There are rapidly emerging opportunities for cities and their surrounding regions, that can plan, design and build Food systems that take advantage of urban and interface areas.

Barriers to planning for Food

These issues are of concern to many planners, but are often difficult to address. Interviews with planning practitioners have identified the following challenges to considering food in their decisions.

Awareness of issues and responsibilities. Everyone recognises that food is essential for life, and many planners understand that this has implications for how land is allocated. However, the scale and complexity of conventional food systems can obscure the effects of planning decisions on food supply. For example, it is difficult to see how the re-zoning of a small site from a farming use to an urban use will affect a global food system that spans several international markets. Consequently, it is understandable that planners and the community in general see planning for food as a global issue rather than a local one, and so 'outside their control'. As a result food issues can fall through the cracks as planners see addressing these issues as someone else's responsibility.

Political will. Planners typically advise or advocate for a course of action that will eventually be decided by an elected representative of the wider community. Ultimately these elected representatives are responsible for the way priorities are weighed up, and have to answer to their electorate for their decisions. If that electorate does not place a high priority on the need to plan for food, there may not be the political will to follow that through in their decisions, no matter what the planners advise.

This is particularly the case where opportunity costs are felt or have an immediate impact on the local area, but benefits accrue to the broader community or are realised in the future.

Time and financial constraints. Planners are typically under considerable pressure to prepare plans or process applications. In the private sector, clients will usually not pay more to allow planners to consider food issues, seeing them as unnecessary. In the public sector, planners have little extra capacity to consider additional issues to their traditional concerns.

Conflict with other priorities. Some planners feel that planning for Food, when it is considered at all, is a subset of sustainability. This means it is given a relatively low priority when weighing planning for Food with other worthy objectives of planning (e.g. accommodating all the urban uses needed to support our wellbeing). Furthermore, there are relatively few tools available to measure the impacts of planning decisions on food considerations, but several measures for other priorities (such as measuring the available land supply for housing). Elements with strong evidence and data available tend to receive a higher priority.

Policy vacuum. There is no **explicit** recognition of planning for food within the *Planning and Environment Act*, or the *State Planning Policy Framework*, which would strengthen the case for considering impacts of decisions on Food. However, Municipal Public Health and Wellbeing Plans do present opportunities for securing food systems and therefore potential for including consideration of Food.

Sphere of influence. Many decisions about land use and food production are currently beyond the control of planning – for example the mix of specific shops in a shopping centre, or the actual use of land zoned for farming. A planning scheme cannot require land zoned for farming to be used for agriculture; it can only prevent certain other uses and developments from taking place.

Section 2. Defining Food-sensitive planning and urban design

FSPUD is an approach to planning for the future that aspires to optimal circumstances for the production, distribution, equitable access to and enjoyment of Food.

FSPUD is not only a response to necessity and urgency (as outlined in Section 1), but it also provides new and exciting opportunities, particularly when it is reconciled with the other aspirations of planning and urban design, such as:

• making sure we can enjoy attractive, liveable surroundings

• facilitating a strong and competitive economy

• facilitating major reductions in the environmental footprint of our settlements

• providing opportunities for stronger community interactions

• ensuring better shared spaces

• supporting fair access to the appropriate goods and services people need

• supportive environments for active living

• making sure these qualities can be provided indefinitely and are resilient to challenges such as peak oil and climate change.

FSPUD outlines a number of opportunities for planners and urban designers to consider Food in the decisions they make. It can be woven into decision-making processes, enabling informed consideration of: supply and access to Food; whether created environments foster enjoyment of Food; and the potential of careful design to enable people to meet their other needs while meeting their Food needs.

A high-level overview of how FSPUD might influence a city's design and its interface with the surrounding regional area is illustrated in Figure 1.

Figure 1: A conceptual model of FSPUD.

EXISTING SITUATION

Large area required to provide enough food to sustain the city

Small area set aside for protection of ecological and landscape values

Benefits of food unequally distributed in the city, urban uses win out in competition with agricultural uses

Large area used to dispose of waste, land used as a sink

FSPUD SITUATION

Smaller area required to sustain the city

Larger area set aside for protection of ecological and landscape protection. Enhanced ecological values incorporated into agricultural land

Food produced and waste reclaimed within the city, benefits distributed more evenly

Smaller area required to dispose of waste and much of it processed, reused and recycled

RESOURCES RECLAIMED AND REUSED TO PRODUCE FOOD

Putting FSPUD in context

Planning and urban design are only one element of making sure that everyone has access to adequate, nutritious, safe and tasty Food, now and in the future. FSPUD therefore needs to be part of a broader suite of strategies that change the way we produce and consume Food.

While planning is a critical part of our response to Food issues, it will not get us across the line without other measures. For example, fiscal incentives, policies, health promotion, community development and marketing campaigns are also essential components enabling people to make informed choices and nurture a culture in which Food is given a higher priority. FSPUD seeks to complement other interventions in the food system and create the optimal circumstances for them to take effect.

FSPUD principles

As mentioned in the Introduction, the overarching objective of the Victorian *Planning and Environment Act 1987* is "to establish a framework for planning the use, development and protection of land in Victoria in the present and long-term interests of all Victorians".[7] To consider the present and long-term interests of all Victorians in relation to Food, FSPUD is guided by 10 principles (see box below).

What does FSPUD mean for the food system?

An FSPUD approach asks planners to consider the impact of their decisions at each of the four stages of the food system introduced in Section 1, briefly outlined below.

Producing Food

Alongside the traditional focus on farming land outside of cities, FSPUD looks at the potential contribution of urban space and other resources that can be used to produce Food. FSPUD relates to land that is dedicated to Food production (e.g. farms or community gardens), land that produces Food as a secondary or incidental use (e.g. productive street trees that provide shade, amenity, add character and produce Food), and land that is set aside or managed differently (including integration of native vegetation) to support the health of the ecosystem within which Food is produced.

FSPUD principles

1. Support secure and equitable access to the Food necessary for a healthy and fulfilling life.

2. Make healthy and sustainable Food choices easy and convenient choices.

3. Encourage use of spaces and places to meet many diverse needs, reconciling Food production and exchange with housing, enjoyment of open spaces and recreational areas, urban cooling, skills and jobs, socialising and community celebration.[30]

4. Provide opportunities for those who wish to participate in growing, exchanging, cooking and sharing Food.

5. Identify and invest in the safe use and re-use of urban resources (soil, water, nutrients, 'waste') that can support viable and sustainable Food production.

6. Protect and/or enhance urban and surrounding ecosystems and increase biodiversity (including, but not limited to, bees, open-pollinating fruit trees, native vegetation).

7. Ensure decisions reflect the long-term value and broader community benefits of access to productive land and experienced producers.

8. Encourage investment and innovation, through secure tenure and supportive operating environments for both community and commercial Food enterprises.

9. Increase resilience, by designing to keep options open for future use of space and resources.

10. Acknowledge and support diversity and sovereignty (the right to have informed choices) over what, how and where people produce and eat Food.

Photo. The VegOut Community Garden in St Kilda, Melbourne – an example of Food production in urban areas.

Processing and transporting Food

FSPUD considers the spatial, energy and material resources needed to get Food from the point of production to the people who consume it. The design and location of infrastructure for processing and distributing Food can have significant water, energy and material requirements and can affect the nutritional value of the final product.

Consumer access and utilisation

FSPUD considers the ability of people to get to where they can buy or access Food, the facilities they have for cooking and storage, and whether they are equipped to make informed decisions about their nutritional needs and the choices available to them. It also considers Food retail, Food service (cafes and restaurants) and opportunities for people to develop their Food knowledge, such as opportunities to learn about cooking and growing Food.

Waste, recycling and post-use management

FSPUD also considers what happens to wastes along the Food supply chain, providing opportunities for waste to be avoided or provided as an input to other processes, all the way through to what to do with organic waste from Food that is not used. Planning and urban design can impact on both the physical infrastructure and social capacity to minimise waste, and re-use/recycle it where possible.

Helping to reconcile competing objectives

"Balancing the built and natural environment, community needs, cultural significance, and economic sustainability, planners aim to improve our quality of life and create vibrant communities."[31]

Planning is a matter of weighing up competing priorities and reconciling diverse objectives. While creating places that enable everyone to access Food is a key challenge of planning, it is certainly not the only objective. For example, improving the quality of life in our communities and the ecological health of the planet, particularly in a challenging and rapidly changing future, requires a holistic view of how our surroundings enable us to meet our diverse needs.

The FSPUD approach considers the physical and spatial implications of meeting Food needs and looks for opportunities to meet other valued outcomes. When a settlement is being designed, FSPUD means thinking about 'and' opportunities rather than 'or'. By planning and designing Food-sensitive places, we have the opportunity to create jobs, build communities and transform, for the better, the environmental sustainability of our settlements and the environmental welfare enjoyed by their inhabitants. Planners and designers can use Food to simultaneously address multiple objectives, creating diverse opportunities for people to meet their needs.

Some of the key areas where FSPUD can contribute to broader objectives are outlined below.

Health and fairness

FSPUD seeks to make sure that no-one faces unreasonable barriers to accessing appropriate Food so that everyone can enjoy its health benefits, including those who are most disadvantaged (such as the socially or geographically isolated, poorer or immobilised residents). Nutritionally appropriate food offers protection from illness and chronic disease, increases life expectancy and provides people with greater vitality. There is increasing evidence that involvement in the provision of Food, be it growing, cooking or social eating, can improve healthy eating behaviour, increase opportunities for social engagement and connection to nature, and help foster increased self-esteem and a sense of achievement.[32,33,34]

Sustainability and resilience

FSPUD creates opportunities for significant reductions in the environmental footprint of urban settlements, by taking advantage of the spaces and resources (such as water and nutrients, including Food wastes) that are abundant in urban areas, and by reducing the transport and storage requirements associated with food. Integrating Food into urban areas can also contribute to regeneration of both urban and regional natural resources. In the face of complex and unpredictable change, FSPUD seeks to support the development of adaptable and responsive settlements and communities. It encourages diversity and seeks to make sure that people are not overly dependent on limited sources of Food, and can enjoy the options and flexibility to improve their Food access if or when they need to.

Livelihoods and opportunity

FSPUD also considers how interventions can support economic activity by providing opportunities to develop skills, and offer people a better chance of finding meaningful, rewarding employment close to home, through such activities as Food production, processing, distribution, Food service, catering and retail. These activities can also underpin other economic activity in the region. FSPUD also seeks to create environments that provide opportunities for interaction between producers and consumers, and support diverse market opportunities for producers.

Photo. Ormond Road in Elwood, Melbourne.

Community and amenity

Finally, FSPUD will encourage spaces associated with producing and accessing Food that:
• are aesthetically beautiful
• can support social interaction
• facilitate the sharing of skills and knowledge
• reflect and emphasise the importance of Food to our individual and collective wellbeing.

Well-designed integration of Food production can help make urban environments more comfortable (e.g. by mitigating against the 'urban heat island' effect),* as well as more enjoyable and safe.
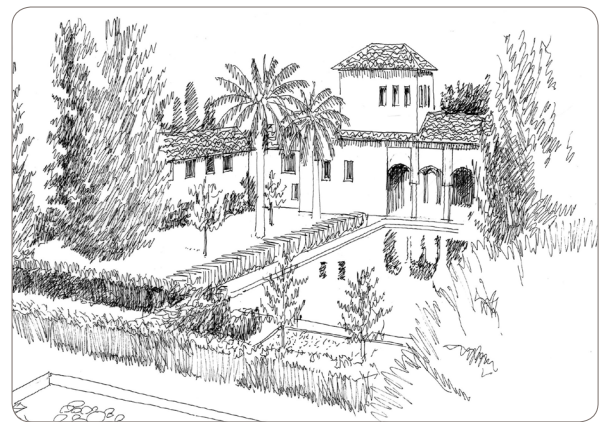
Sketch. The gardens of the Alhambra in Granada, Spain, were built in the 14th century and are recognised by many as a high point in garden design. The gardens were designed to simultaneously reconcile the patron's idea of paradise with Food-producing objectives. It thus incorporated elements such as ponds stocked with fish, and Food-producing trees that also provided shade and mitigated against climatic extremes.

Photo. The VegOut Community Garden in Melbourne's St Kilda, reconciling Food, social and aesthetic objectives.

---

* The 'urban heat island' is a phenomenon whereby temperatures in urban areas are often several degrees warmer than the surrounding rural countryside. The urban areas also cool more slowly at night as dense built-up areas, lack of vegetation and draining of water mean they capture and store heat during the day and release it slowly at night. For example, Melbourne is an average of 2–4°C degrees warmer than surrounding rural areas, up to a peak of 7°C.[35]

The FSPUD matrix

The FSPUD matrix is a tool for exploring the integrated nature of planning objectives and Food objectives. It is used to highlight the broad range of food issues relevant to planning and urban design, and to explore how these relate to the main stages in the food system and the broader objectives of planning and design.

The columns and rows in Table 1 use the headings described on pages 12-14. Each cell provides a means of exploring how the different objectives intersect. For example challenges and suggestions relating to Food production and how it intersects with community and environmental health, and equity issues would be found in cell A. The challenges and opportunities that arise from food waste and re-use, and how it intersects with amenity and social inclusion would be found in box B. For ease of reference the challenges and opportunities are presented on separate tables.

Table 1. The FSPUD matrix

	Health and fairness	Sustainability and resilience	Livelihoods and opportunity	Community and amenity
Producing Food	A			
Processing and transporting Food				
Consumer access and utilisation				
Waste and re-use				B

Section 3. Opportunities and characteristics of FSPUD

The opportunity created by FSPUD is to look differently at spaces and settlements, to creatively integrate apparently conflicting objectives.

The framework of FSPUD opens up a wide range of considerations, opportunities and potential activities that can add value to our urban spaces. Table 2 uses the FSPUD matrix to map out some of the diverse sets of possibilities as suggested areas for further consideration and exploration.

There are a number of considerations to keep in mind when considering how the FSPUD framework might be used in different circumstances and contexts. In some cases, the most obvious way of achieving some of these characteristics appears at odds with other objectives of planning and urban design, or indeed other characteristics of FSPUD. For example, increasing housing density can contribute to management of urban sprawl, but then requires careful consideration of personal or household access to open space, including for Food production.

Some areas of this matrix are much better understood than others, where activities and approaches are well defined and easy to identify. However, there are other areas that are poorly understood, or where the solutions or

opportunities are not so easily identifiable. In these cases, we look forward to seeing creative new solutions emerge in coming years. A matrix mapping a comprehensive set of challenges is included in Appendix 3.

Throughout the consultations contributing to this resource, a number of participants suggested including a separate row for 'the environment' or critical inputs to the food system. This has not been done, as the authors consider it to be an underpinning of the whole rather than a separate 'stage' of the food system. It is taken as given that the food system cannot operate without a healthy natural resource base that provides critical inputs, such as soil, water, nutrients and pollination.

Capturing these opportunities will often require initiatives in other fields as well as planning. However, planning and urban design can create the best conditions for other initiatives to be effective. In other words, planning policy can help to make sure that the built environment can support complementary initiatives rather than working against them.

Table 2. FSPUD opportunities and characteristics matrix

	Health and fairness	Sustainability and resilience	Livelihoods and opportunity	Community and amenity
Producing Food	The importance of Food production and Food producers is appropriately recognised in relevant planning schemes.	Diverse Food production systems (e.g. large and small, urban and rural, commercial and community) build resilience to economic and environmental pressures.	The jobs and economic opportunities of Food production are recognised and supported by infrastructure and the planning system, providing certainty, stability and confidence to invest in Food production.	Opportunities for community interaction and social activities are enhanced through localised Food production (e.g. community gardens and common orchards).
	The costs and benefits of land lost to Food production are understood and shared across the community.	Fundamental ecosystem services are recognised and supported by urban development (e.g. oxygen production by plants, water purification by streams and waterways, open-pollination by bees and insects).	Urban areas contribute to the viability of surrounding Food producers through appropriate management of storm-water and cycling of organic wastes.	Public spaces incorporate Food (e.g. street fruit and nut trees, herbs and productive shrubs and perennials), to increase easy access to Food; provide amenity through shade and cooling; demonstrate seasonal variation in the landscape; and create opportunities for social interaction and inclusion.
	Space and resources are available for Food production (e.g. in private and/or community gardens with access to sunlight, soil, water, nutrients).	Urban and peri-urban Food production takes advantage of available water and nutrients, reduces transport and storage requirements, and contributes to other environmental objectives (e.g. storm-water management, enhanced habitat and aesthetic values).	Diverse skills and jobs are available in Food production, at both large and small scales (e.g. from Food manufacturing to bee-keeping).	Safety and pest issues related to Food production are proactively managed.
	Underutilised space is made available for Food production (e.g. vacant public land, roof-top gardens, nature strips, railway buffers).	The building blocks of Food production are planned and integrated within urban design (e.g. infrastructure for water and nutrients, access to sunlight and soil, open-pollinating fruit trees).	Space within urban areas is available for both community and commercial Food production.	Positive attitudes to Food production and Food producers are fostered through the community.
	Relevant Food production knowledge and support is easily available (e.g. soil testing, advice on water resources, compost and access to the relevant tools).	Public space is designed to support Food production (e.g. street plantings that can be naturally irrigated by urban run-off).	A flexible planning system is able to recognise and support new community and commercial production ventures (e.g. aquaponics, urban agriculture, vertical farms etc) – see case studies.	Educational facilities enable people to learn how to produce, prepare and enjoy Food.
	Processes for assessing the safety of urban/potentially contaminated land for Food production purposes are streamlined and improved.	Recycled organic materials (e.g. compost) are used to improve soil quality.	Maintenance of street and open-space plantings provide opportunities for entrepreneurial individuals, communities and businesses.	

Table 2. FSPUD opportunities and characteristics matrix *(continued)*

	Health and fairness	Sustainability and resilience	Livelihoods and opportunity	Community and amenity
Processing and transporting Food	There is a strong market demand for Food processors to deliver Food products – healthy and sustainable options are sought after. Diverse processors have equitable access to resources, processing facilities and retail outlets. More effective Food transport systems reduce urban transport pressure (e.g. rail that is better set up for Food transportation).	Food processing facilities are located to maximise resource exchange and opportunities for renewable energy generation, waste and water recycling (e.g. outputs from Food production facility are fed into other processes, or composted and used for Food production). Processors are located for secure and convenient access to Food product and/ or have developed resilient sourcing strategies. Packaging materials consider waste minimisation and are sourced from renewable resources. Transport planning facilitates intermodal exchanges and diverse transport options, including expanded use of the rail network. Need for, and impacts of, transport and storage are minimised.	Jobs in Food processing and distribution are locally accessible. Smaller scale/ micro processing and distribution provide opportunities for local and home employment. Enterprise and diversity are supported through planning and design, creating options and niches for innovation. Opportunities for developing skills in Food processing and distribution are readily available.	Urban Food processing is kept to an appropriate scale for the urban environment, and wastes are minimised and cycled. Community facilities for Food storage and preservation are available. Local laws facilitate home and community processing and exchange. Positive attitudes to local Food processing and distribution are fostered through the community.
Consumer access and utilisation	Retail planning supports competitive and accessible positioning for a diverse and balanced range of Food outlets, including fresh food shopping (e.g. municipally owned and managed fresh Food markets in key shopping locations). Existing and new Food outlets increase access to Food, making diverse Food choices available to all residents. Appropriate Food is readily available, regardless of socioeconomic status or cultural background. Facilities for storage and preparation of Food are available, at a public or community level if required. Promotion and incentives encourage the consumption of a wide variety of Food. Transport planning supports active transport access to fresh Food outlets.	Consumers have access to a variety of Food sources, including from small and large-scale systems that are resilient to different threats (e.g. extreme weather events, drought). Food affordability is underpinned by low emissions/water footprints and use of readily available inputs. Food outlets are widely distributed, enabling access by walking, cycling or public transport. Food outlets are co-located with other key destinations to facilitate multipurpose trips.	Increased opportunities for local jobs in Food service, retail, preparation and delivery through re-localisation and dispersion of Food outlets. Increased opportunities for innovative Food retail and distribution initiatives (e.g. bicycle grocery delivery). Food affordability is achieved through smart systems, reduction of waste and effective use of available resources, enabling fair living wages to be paid to those involved in the Food system. Encourage social enterprises.	Food outlets serve as meeting places and focal points for the community (e.g. cafes and delis that have community notice boards). Outlets providing Food are designed as attractive places to be and encourage community interaction. Urban design incorporates Food education into the way streets and places are designed and improved (e.g. interpretive signage beside urban orchard trees noting fruit seasons, harvesting details, nutrition and culinary uses). Water fountains are readily accessible.

Table 2. FSPUD opportunities and characteristics matrix *(continued)*

Waste and re-use	Health and fairness	Sustainability and resilience	Livelihoods and opportunity	Community and amenity
	People have the storage facilities, skills and knowledge to reduce Food waste, packaging waste and energy waste.	Infrastructure to process Food waste and waste/stormwater and to redistribute these resources back to Food production is planned for and invested in early in new developments. Established urban areas are redesigned to meet these objectives.	Availability of urban organic wastes provides an affordable and reliable fertiliser source, reducing Food producers' exposure to fluctuating synthetic fertiliser cost and availability.	The processing of organic waste and water does not cause localised odour, insect or pollution issues and is safe for large or small-scale agricultural re-use.
	Unused/unsold Food is redistributed to those in need where appropriate (e.g. excess produce from markets or restaurants is given to charities providing Food relief).	Local facilities to process Food waste, such as composting and worm farming, are available at a household, business, community or municipal level, depending on the appropriate scale.	Enterprises managing community and commercial composting systems make sure that they are well run and make efficient use of available resources.	Improvement in soil health contributes to increased range and quality of urban plantings for shade and comfort, Food production, visual amenity and community spirit (e.g. soil improvements and micro climates enable new plants to be grown in temperate areas).
	The processing of organic waste and water is distributed through the urban environment and not concentrated in lower socioeconomic areas.	Renewable energy sources from organic wastes are integrated with urban energy requirements (e.g. Food and green waste providing for local gas needs through bio-digesters).	Opportunities are created to process and sell surplus local Food and locally produced organic fertiliser.	Positive attitudes to local waste processing are fostered through the community.
	Re-use of organic waste and water is safe.	Improvement in soil condition through readily available organic fertilisers.		
		Packaging waste is minimised through innovative distribution systems, and compostable or recyclable options.		

Section 4. Putting FSPUD into practice

Planning and urban design involve diverse professions, including specialists who focus on different aspects of strategic planning and the development process. Professionals who shape the future of the built environment include strategic planners, statutory planners, transport planners, community health and social planners, urban designers and landscape architects, to name just a few.

This chapter provides some suggestions as to how these diverse professions may be able to consider Food systems within their work. It includes preliminary ideas on:

- **influencing strategy and policy development** to make sure the legislative landscape supports consideration of Food issues
- **considering FSPUD at the various stages of the planning process** to make it easier to implement FSPUD in the existing planning system
- **making budget setting submissions** to influence how budget priorities are set
- **cultivating culture change** so decision makers understand why Food issues are an appropriate focus for their time and energy.

These issues are further detailed below.

Influencing strategy and policy development

Strategy and policy development provides many opportunities to influence how Food systems are considered within planning and urban design. Some of the key opportunities are outlined below.

Reviewing the *State Planning Policy Framework*

The *State Planning Policy Framework* integrates various state-wide strategies and policies and provides the context within which the *Local Planning Policy Framework* exists.

The *State Planning Policy Framework* is constructed from relevant government policies and strategies. The purpose of state policy in planning schemes is "to inform planning authorities and responsible authorities of those aspects of state planning policy which they are to take into account and give effect to in planning and administering their respective areas. The *State Planning Policy Framework* provides a context for spatial planning and decision making by planning and responsible authorities."* It is the Victorian State Government's expectation that planning and responsible authorities "should endeavour to integrate the range of policies relevant to the issues to be determined and balance conflicting objectives in favour of net community benefit and sustainable development".**

To have the most significant impact, FSPUD would need to be embedded in the *State Planning Policy Framework*. The instruments and policies that are incorporated into the *State Planning Policy Framework* (SPPF) are reviewed from time to time, and at these times the relevant department (at the time of writing the Department of Planning and Community Development) will consult interested parties. Therefore, these reviews may provide an opportunity to put FSPUD onto the legislative landscape.

Reviewing the *Local Planning Policy Framework*

The *Local Planning Policy Framework* (LPPF) integrates various local strategies and policies into a coherent framework to inform planning decisions by a local authority. It must include a Municipal Strategic Statement. "The Municipal Strategic Statement is a concise statement of the key strategic planning, land use and development objectives for the municipality and the strategies and actions for achieving the objectives."[36] It is reviewed every three years.

The Municipal Strategic Statement reviews provide a significant opportunity to make explicit statements on the importance of planning for Food. It underpins the zoning, overlays and local planning policies that set out how the strategy will be implemented. A number of local councils in Victoria have incorporated explicit statements about Food security and sustainability into their Municipal Strategic Statement.

This is strengthened even more when the matters to be addressed in the Municipal Public Health and Wellbeing Plan are incorporated into the Municipal Strategic Statement (or the Council Plan). More information on these can be found in the case studies on VicHealth Food for All and Wodonga (see Section 5 on pages 51 and 52).

Amending local by-laws

Many municipalities have local by-laws that may unintentionally deter FSPUD activities. These could include constraints on keeping bees or chickens, sale or exchange of Food in public spaces, or planting in nature strips or disused public spaces. Identifying and removing barriers (and/or creating supportive frameworks) within specific municipalities can open up opportunities for people to partially meet their own Food needs, and contribute to other objectives of planning (e.g. community development – see the VicUrban Meridian development case study on page 44).

Applying FSPUD principles to other planning and urban design policies and strategies

Planning policies and strategies set out how land should be used. Other council plans can also influence land use. The review or drafting of these policies and strategies provides a number of opportunities to build in FSPUD principles. While not an exhaustive list, some examples of strategies that provide opportunities to implement FSPUD principles are outlined below:

1. **Structure plans and growth strategies.**
   The preparation of structure plans or other local spatial plans provide opportunities to:
   - pursue urban forms that integrate a broad mix of land uses
   - make sure they incorporate opportunities for Food production, distribution and the sale of Food
   - make sure that these are linked with accessible transport options.

   Where structure plans involve the loss and fragmentation of agricultural land to urban growth, its impact on commercial viability (actively farmed or fallow) should be taken into account when determining where to develop.

_____

* clause 10.01[8]

** clause 10.04[8]

Where development of agricultural land **must** occur, consideration could be given to how new developments can be designed to maintain or improve Food production, both within the development and by taking advantage of the interface between urban and rural uses (see Prairie Crossing, Baix Llobregat and Alimentos Para Vida case studies. Section 5, pages 35, 36 and 41).

Peri-urban areas face a different set of issues than inner-urban areas, but this is often where the most viable agricultural land is located. These areas are often highly contested, as the high value of immediate residential development is balanced with longer-term or broader public-good values of retaining productive land and open space near urban areas. The preparation of urban growth strategies for metropolitan and regional centres can take into account the full costs and benefits of maintaining productive capacity for communities now and into the future. Improved understanding of risks and opportunities relating to food systems should be a part of land use decisions on the urban fringe.

Thinking about proximity of new developments to activity centres is therefore an important consideration. How will residents access activity centres – does it have good walking and cycling access and will public transport be available? Distance, the walkable catchment of outlets, and levels of density that support active transport modes will all influence the accessibility and viability of Food outlets.

Furthermore, strategies of this type consider the infrastructure needed to support the wellbeing of the people that will be occupying the retrofitted or newly developed area. FSPUD suggests that Food production and distribution opportunities are considered as an element of infrastructure and are given appropriate weight in the distribution of land uses.

2. **Retail planning policy.** In planning retail mix, providing for a variety of Food retail and Foodservice within easy access to residents is important. There has been a trend to provide retail via large-format retail outlets and shopping centres, often located on the edge of a town, where large sites are easier to come by and access from nearby main roads is good. However, the size of the catchment related to these outlets means that many of their customers will live a considerable distance from them, and may be disadvantaged in terms of Food access.

In determining retail planning policy, consideration should be given to:
- loss of agricultural land
- mixed land use – retail is only one element of centre planning
- provision of public-realm shopping areas (including public areas and streets)
- a mix of large and small supermarket retailers with street frontages
- supporting the viability and size of retail units to accommodate small and medium- sized retail outlets (that are more broadly accessible)
- the ability to access retail outlets via active transport modes – walking, cycling, using public transport
- walking, cycling and public transport infrastructure needs.

Furthermore, although not directly related to current land use planning practice in Victoria, consideration should be given to mechanisms that support the following:
- fresh Food retailers, e.g. fruit and vegetable greengrocers, butcher (meat, poultry, eggs), fishmonger, and bakeries with a selection of wholegrain bread products
- a range of Food services (e.g. takeaways, cafes, restaurants) to make sure that fast food outlets are not the only local eating out venues.

Such mechanisms may include, but are not limited to:
- appropriate zoning decisions e.g. mixed use zoning
- preparation of an appropriate urban design strategy to facilitate the protection of the public realm and a mix of retail scale and opportunity
- application of planning overlays relating to design and character of retail areas
- special rate, rent and tax allowances, e.g. the community owns the premises and can afford to charge lower rents; foregoing municipal property taxes and/or state land taxes for socially valuable uses
- provision of municipal/community owned space, e.g. municipal market space, municipal or smaller unit owned supermarket premises to lease to a supermarket retailer of its choice
- priority tenants for council-owned premises
- negotiating or providing cheaper finance to operators

- adjusting signage regulations or planning requirements to restrict advertising of fast food outlets[37]
- Implementation of *A Healthier Serve, The Heart Foundation's Guide to healthier catering*, in particular the section on 'Creating your own healthy catering policy',[38] by all council facilities, services and contractors.

3. **Housing strategies.** The need to protect agricultural land and provide adequate, affordable and appropriate housing to keep pace with the rate of household formation are two challenges that are often considered to be conflicting. Planning for increasing residential densities will help minimise land take, and is an important component to support the viability of the corresponding local provision of retail outlets. This is necessary to make sure that they are distributed so that everyone can walk to them. Levels of density of 25 to 30 lots per hectare are best able to provide this level of support.[39]

4. **Urban design/urban landscape guidelines.** Strategies that integrate productive landscapes (including fruit/nut trees) with other landscape objectives can 'open the door' to new ways of seeing streetscapes, by both developers and the existing and future residents. Urban design guidelines can also play a role in making sure that stormwater can be used to effectively nourish the street and open-space landscaping, and that the stormwater that does leave the urban area is not detrimental to downstream agricultural land. (See the VicUrban Meridian development case study on page 44.)

5. **Subdivision guidelines.** New subdivisions can lay the groundwork for Food-sensitive residential areas by making sure they embody water-sensitive urban design characteristics, provide for private and shared garden space (with appropriate solar access), and consider where Food access, exchange and interaction can occur within neighbourhoods. In this way, subdivision design can maintain options for inhabitants to retrofit their surroundings to better meet their Food needs, even if this was not a consideration when they decided to purchase that land. (See Southlands and Alimentos Para Vida case studies, pages 43 and 41.)

6. **Integrated Transport Plans.** Council can create an integrated transport plan that prioritises consideration of active transport modes (walking, cycling and public transport use) and improves access to local Food production and markets, activity centres and Food outlets for non-car users. This provides for greater equity of access to a range of Food opportunities, and ensures future sustainability and resilience of these locations and the community they serve.

7. **Open space/recreational strategies.** These can be used to realise opportunities for Food uses and integrate them into these outdoor spaces. Possibilities for edible planting, community gardens and city farms, farmers markets, harvest festivals, cafes and storage facilities for shared tools can facilitate the development of robust, multifunctional open spaces within the community. This will require reconciling and managing the many and valued roles of open space (e.g. biodiversity, education, recreation, cooling) into an integrated design that is sensitive to its surroundings.

8. **Municipal Public Health Plans.** These are a legislative requirement of the *Public Health and Wellbeing Act 2008*. *Environments for Health*[40] is a framework developed by the Victorian Department of Health to guide planners in preparing these plans, which considers the built and natural environment, among other matters. FSPUD considerations that overlap with these plans could include actions to address active transport, equity of Food distribution, preservation of good-quality arable land (where available), and also the need to address population-health goals by providing access to fresh, nutritious, accessible Food outlets and service.

9. **Rural land strategies.** This resource primarily focuses on the planning and urban development issues related to Food within urban areas and their interface with surrounding productive regions. Land use issues that are less related to urban expansion or consolidation – such as increasing tension around fragmentation of agricultural land, and competition between amenity and productive uses in rural landscapes – also affect food systems. An FSPUD approach to these issues has not been developed in this resource, but would encourage both maintenance of productive capability through certainty in planning schemes, as well as integration of productive uses within new settlements.

(See Prairie Crossing and Wanzhuang case studies on pages 36 and 42 respectively.) Strategies that provide unambiguous support for retention of agricultural land on the urban/rural interface can help provide certainty to farmers (and financial institutions) that investment in the agricultural value of their land is worthwhile. This certainty needs to be matched with flexibility and financial options to enable transfer of ownership without undermining productive capacity. These issues have been comprehensively examined in Victoria through the Outer Suburban/Interface Services and Development Committee's Inquiry into Sustainable Development of Agribusiness in Outer Suburban Melbourne[2] and the work of the Future Farming Expert Planning Panel.

Applying FSPUD at the different steps in the planning process

For the purposes of this resource we have divided planning into strategic planning, statutory planning and public realm design.

Strategic planning is where decisions are made about the long-term use of areas of land. Statutory planning is where decisions are made about the specific use and development of parcels of land, and whether the development of that land is in accordance with the desired development outcomes, and thus merits a planning permit.

Planners and urban designers often get involved in the design of the public realm and this provides opportunities to make sure that space:

- embodies features that produce Food (e.g. choice of trees)
- facilitates or provides access to diverse Food outlets
- provides educational or community experiences about Food
- provides equity of access for active transport modes.

The issues outlined below are not intended to be comprehensive, nor are they all relevant to every planning decision. This section is intended to stimulate thinking about how FSPUD might be addressed, rather than provide instructions or solid positions for decision making.

Strategic planning

Strategic plans set out how land should be used. In Victoria, the Victoria Planning Provisions[8] provide the framework for making plans. Within these provisions are the purposes and requirements of all the zones that can be applied to land and are used to outline what are considered appropriate and inappropriate land uses within this zone. All land in Victoria is covered by a zone. Each zone contains three lists of uses that describe what is permitted as of right, is permitted only after consideration of the issues, or is prohibited. By way of example, in the Residential 1 Zone (R1Z), the uses that can happen as of right (often referred to as Column 1 uses and for which a planning permit is not required) include dwellings, aged care, roads, tramways and places of worship.

The second list, known as Column 2, lists the uses that may be acceptable subject to the examination of the merit of the proposal. These uses require a planning permit. In the Residential 1 Zone (R1Z) these uses include accommodation, medical centres, petrol stations, car parks and places of assembly.

The third list, Column 3, lists prohibited uses that are not permitted within the zone. In a Residential 1 Zone (R1Z) these uses include retail uses, offices, nightclubs and brothels.

As well as zones, some areas are also covered by overlays, which provide additional controls over discrete areas to achieve a particular objective. The application of overlays vary according to a council's objectives and/or the characteristics of the land. For example if the objective is to protect neighbourhood character, it may be subject to a design and development overlay. Alternatively, if landscape has been identified as an issue in an area, it may be subject to a significant landscape overlay.
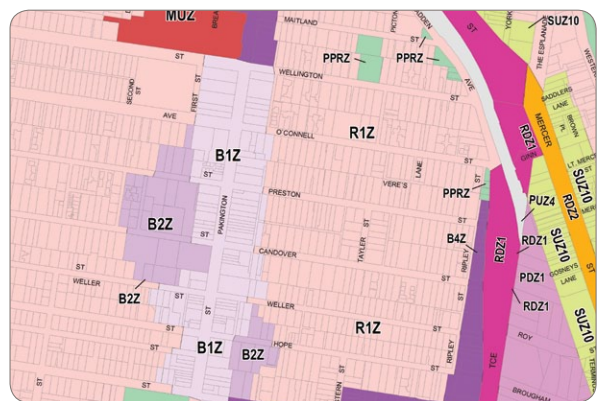

Figure 2. A zoning plan for an urban area, outlining the different zones that apply to each piece of land. Source: Department of Planning and Community Development (DPCD) web site, November 2010.

Figure 3. An overlay plan for the same urban area, outlining those areas that are covered by overlays that control an additional aspect of development not covered in the relevant zone. In this instance they are heritage overlays that trigger specific controls in these areas. Source: DPCD web site, November 2010.

Strategic planning is instrumental in determining the location and quality of new or greenfield development areas. It is also used to encourage urban consolidation and retrofit existing urban areas.

Strategic planning occurs in many different scales and locations – rural, regional, hinterland, interface and urban – and each scale and type of development has different issues and opportunities in relation to Food. The location, size and characteristics of the planning area being considered will influence what is possible and realistic when applying FSPUD principles. The Southlands case study (see page 43) illustrates the different responses that may be appropriate at different scales of development.

Some issues that may arise in strategic planning are outlined below.

Issue 1. What is the impact of a proposal on the amount and viability of productive land?

Productive land with adequate resources for food production is finite and is likely to become increasingly valuable. Continued loss of the quantity or quality of productive land in critical areas could impact on future food supplies. Factors that should be considered include:

- Has the current and potential value of agricultural land been quantified in terms of economic (including flow-on to jobs), environmental and social costs/benefits?
- If productive agricultural land is rezoned, could provision be made to make sure productive capacity is retained within the new land use? (Refer to section 17.05 of the SPPF for guidance[8].

Also see the Prairie Crossing, Alimentos Para Vida and Wanzhuang Eco City case studies on pages 36, 41 and 42 respectively.)

- Would allocation of land for community Food production be appropriate (see Baw Baw Shire 'Active by Design' on page 53)?
- Are there opportunities for redevelopment of existing urban areas to improve opportunities to produce Food, for example edible streetscapes, apiaries, community gardens (see Argentinian case study on page 49) or city farms?

Issue 2. Are there interface issues between agricultural land and other uses?

Some land uses are particularly sensitive to what occurs nearby, and there can be tensions where residential land directly adjoins agricultural land. However, with careful consideration of where the edge is and the distribution of land uses, the interfaces or 'edges' also present opportunities to improve the viability and sustainability of both the productive and residential communities. New residential developments adjacent to productive land could consider:

- Could non-sensitive or less sensitive land uses be located between agricultural and residential uses to avoid conflicts, for example parkland, recreational facilities or commercial areas?
- What provision has been made to make sure stormwater run-off is maintained at pre-development levels and with maintained or improved quality?
- Are there possibilities for urban stormwater, wastewater, energy and nutrient management to improve the resilience and viability of adjacent production systems? (See Anaerobic digestion of biowaste case study on page 39.)
- Can siting of infrastructure and buffers reduce the likelihood of speculation on adjoining land that may occur from assumptions of further residential development?
- Are there opportunities to increase value returned to producers in cooperation with urban communities? (See Baix Llobregat and Yarra Valley Gateway Estate case studies on pages 35 and 40 respectively.)

Issue 3. How will the people living/working in the area access Food?

Food access can be affected at the strategic planning stage. Questions that could be considered are:

• What are the nearest sources of Food? Is Food access car-reliant? For example would it typically require the people living or working there to drive to retail outlets or other sources of Food?

• Has consideration been given to facilitating a range of outlets (small or large supermarket, independent fresh Food retailers, healthy Food service outlets, municipal and farmers markets)? (See case studies on Wodonga and Belo Horizonte, Brazil on pages 52 and 48 respectively.)

• Could changes be made to the density, transport infrastructure or layout design to facilitate walking, cycling or public transport access to Food?

The plan in figure 4 links the town centre to its hinterland through the creation of a greenway 'spine' that makes walking and cycling relatively more attractive than other modes of transport. It also makes provision for community gardens along a high profile and frequently visited route.
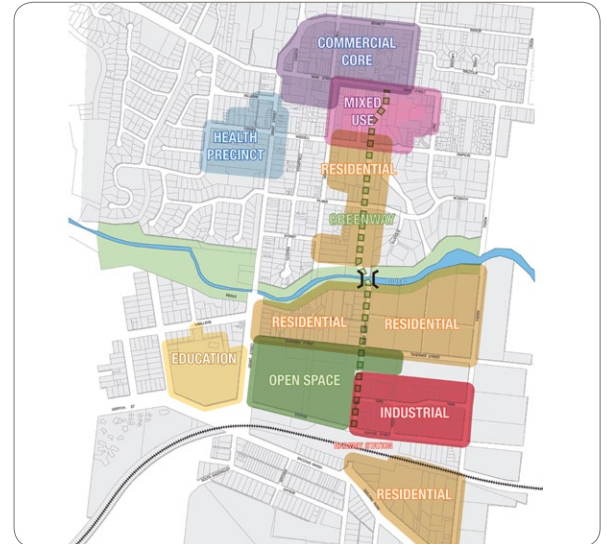

Figure 4. Extract of a plan for an existing town centre. Image courtesy of Moorabool Shire Council.
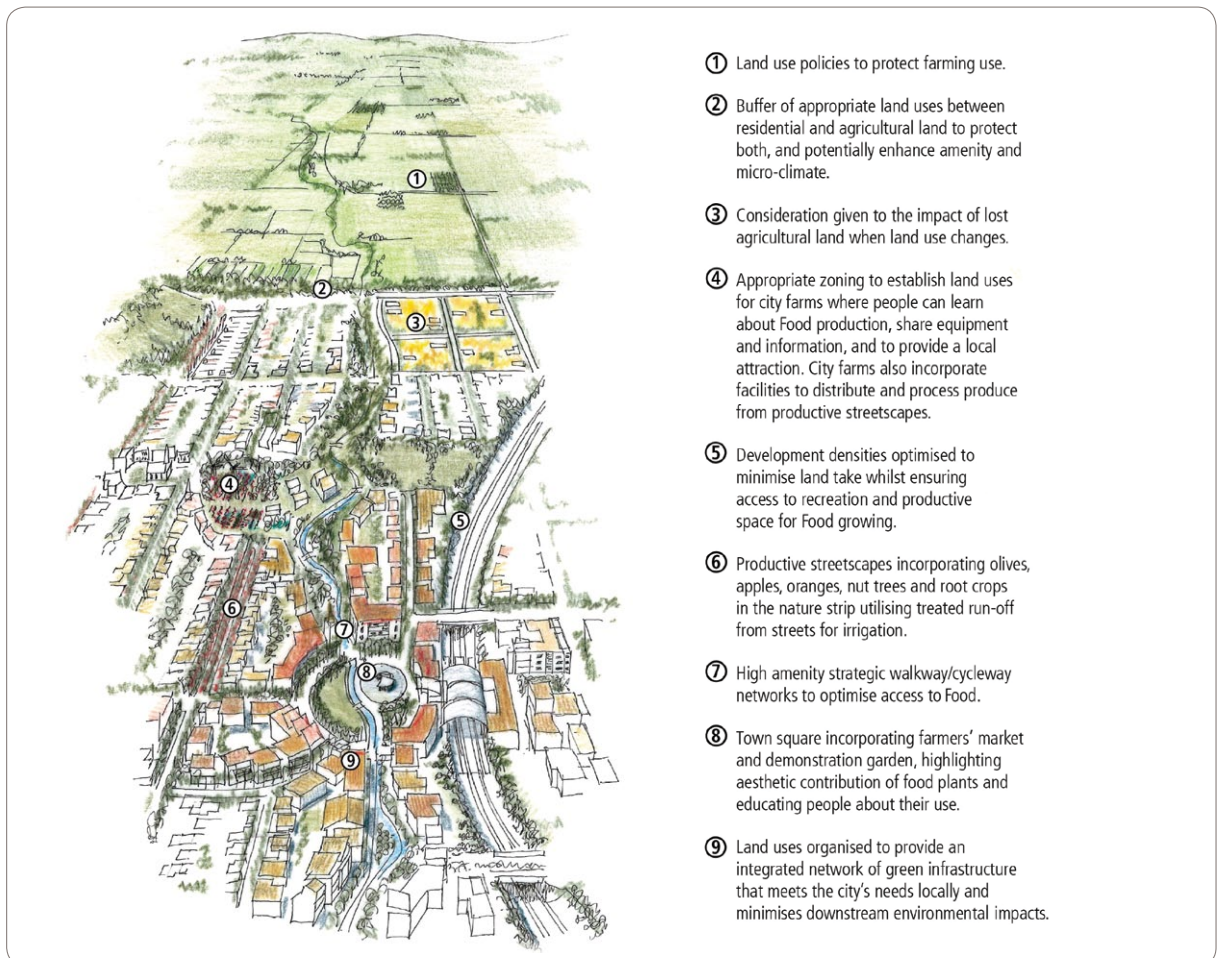

① Land use policies to protect farming use.

② Buffer of appropriate land uses between residential and agricultural land to protect both, and potentially enhance amenity and micro-climate.

③ Consideration given to the impact of lost agricultural land when land use changes.

④ Appropriate zoning to establish land uses for city farms where people can learn about Food production, share equipment and information, and to provide a local attraction. City farms also incorporate facilities to distribute and process produce from productive streetscapes.

⑤ Development densities optimised to minimise land take whilst ensuring access to recreation and productive space for Food growing.

⑥ Productive streetscapes incorporating olives, apples, oranges, nut trees and root crops in the nature strip utilising treated run-off from streets for irrigation.

⑦ High amenity strategic walkway/cycleway networks to optimise access to Food.

⑧ Town square incorporating farmers' market and demonstration garden, highlighting aesthetic contribution of food plants and educating people about their use.

⑨ Land uses organised to provide an integrated network of green infrastructure that meets the city's needs locally and minimises downstream environmental impacts.

Figure 5. Some examples of strategic planning measures applying FSPUD principles.

Figure 6. Extract from a concept for a 'greenway' high-amenity route to a town centre and shops. Image courtesy of Moorabool Shire Council.

Figure 6 shows an urban 'greenway' that makes walking and cycling relatively more attractive than other modes of transport. It also increases people's practical walking range by diminishing the barriers to walking and increasing the attractors. The greenway incorporates a number of different elements including community gardens. It is designed to utilise micro-climatic conditions and water-sensitive urban design (WSUD) to create comfortable, pleasant places for people, and provide better conditions to produce and celebrate Food.

Statutory planning

Statutory planning is where decisions about whether a proposed use or development conforms to the requirements of the planning scheme and the stated desired development outcomes (often expressed in a development plan overlay) in a particular area have been accomplished. Statutory planning considers a wide range of policy and planning provisions, as identified in the relevant planning controls for a particular piece of land. The key issues considered include how the proposed use or development will implement the *State Planning Policy Framework* and the *Local Planning Policy Framework*.

This requires consideration of the purpose of the zone, objections, referral authority comments, and other matters relevant to the application the application; these may include the subdivision of land, the height, bulk and mass of development, building setbacks and boundary treatments, and open space contributions.

Some FSPUD issues that could be considered during statutory planning are outlined as follows.

Issue 1. Is there a need to consider interfaces with agricultural land?

If the land being developed is adjacent to agricultural land, does the proposal consider:

- Use of landscape features (e.g. buffer planting or existing ridge or creek lines) or strategic position of infrastructure to minimise conflict and improve positive benefits to both urban and agricultural land uses on both sides.
- Opportunities and infrastructure for exchange of resources (water and nutrients), energy or Food.
- Opportunities for local job creation.

Issue 2. How does the development facilitate Food choices?

Facilitating access to a wide range of Food choices could consider the following:

• Is there provision for inhabitants to produce Food if they want or need to?

• Is there space available for Food production, either private or public, for example through community gardens, city farms and edible landscapes?

• Does the layout of neighbourhoods, streets and houses consider impacts on productive capacity? Are they orientated to make sure gardens can receive sunlight? Do they facilitate access to roof spaces? Do they protect from prevailing winds and allow for water capture?

• Has consideration been given to diverse and accessible Food outlets?

• Are there spaces where markets or small permanent Food outlets can be established?

• What routes will people living or working in the area have to use to access Food? Are these routes likely to be perceived as direct, safe, attractive and not too far to walk?

Retail configuration also provides opportunities to consider how the production, access, balanced provision and enjoyment of Food can contribute to the wellbeing of the people who access it.

① Landscape buffer between urban and rural uses.

② Natural features used to define firm and long-term edge to urban areas.

③ Streets predominantly orientated north-south to ensure the gardens receive adequate sunlight, with additional measures to assist in storm water capture and protect from prevailing wind when required.

④ High amenity walking / cycling routes that enable people to access Food sources.

⑤ Guidelines ensuring residents have access to adequate and productive open space in front and back gardens.

⑥ Local shops with extensive walkable catchments to maximise viability of Food shops.

⑦ Spaces for local production of Food and farmers market.

Figure 7. Some examples of potential statutory measures to implement FSPUD principles.

## Detailed design of the public realm

The design of the public realm can have a significant impact on how people interact with each other and the values they attribute to their surroundings.

The public realm can provide opportunities to grow Food, to raise awareness about how Food is grown, to purchase or eat a more diverse range of Foods, and to help make the uses adjacent to them more attractive and appealing. FSPUD considerations in the detailed design of the public realm could include those outlined below.

Issue 1. Does the subject area increase positive exposure to Food?

Enabling people to experience the way Food is grown, as well as its texture, smell, growth patterns and seasonal changes can all help to increase awareness about Food. To make sure that this potential can be realised, planners may wish to consider:

- Are there opportunities to integrate productive uses into public spaces?
- Has any provision been made to provide signage that informs passers-by of the Food value of productive street trees or their role in supporting the area's ecological health?
- How do the Food production features contribute to the area's amenity and opportunities for community participation?
- Are public productive spaces accessible to all? Are they safe and visually appealing?
- Are there opportunities to interact and celebrate local Food production efforts, for example front garden/nature strip competitions, giving awards for the best Food gardens?
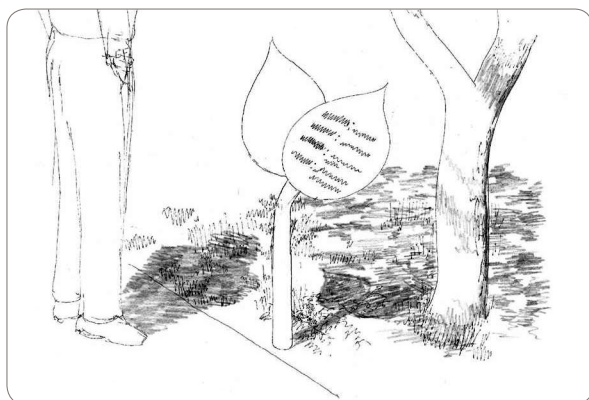
Sketch. Attractively designed 'Did you Know?' signage can help people understand what they are looking at, its Food and/or ecological value, as well as contributing to the streetscape.


Sketch. Indicative awards signage.

Issue 2. Does the space encourage development and use of diverse Food outlets?

Matters for consideration include:

- Is there provision for public or shared exchanges, e.g. farmers markets, privileged access to highly trafficked areas for local producers? (See Belo Horizonte, Brazil case study on page 48.)
- Does it provide an attractive setting to make sure that local Food outlets and other community Food activities in the public realm are perceived as attractive, friendly, safe and pleasant, thereby providing a convenient and easy alternative for Food access?
- Does design promote certain food outlets/ services more than others, for example in terms of signage, corner blocks? Can healthy options be given equal visual promotion/locations?

Photo. Camberwell Market, Melbourne. (Photo by Alastair Campbell)
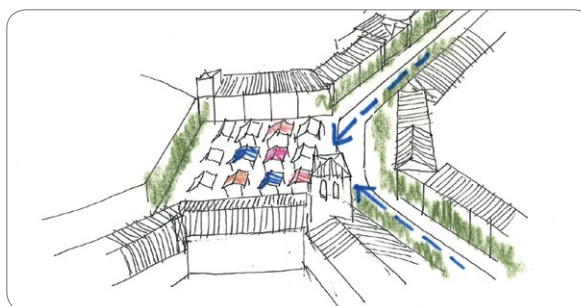
Sketch. Market square with open air stalls. Locating Food outlets where people don't have to go out of their way to visit them, such as in high-profile locations adjacent to routes with high pedestrian flows, will help the outlets compete against other sources of food.

Issue 3. How does the subject area facilitate the celebration and sharing of Food knowledge and culture?

Matters for consideration include the following:

- Are there opportunities for preparation and sharing of Food, e.g. community kitchens, pizza ovens, barbecue spaces?
- What opportunities are there to celebrate local Food within an area, such as a 'taste of place' festival?
- Is a shelter or other facilities provided in the open space to facilitate communal meals and family gatherings?

Photo. Attractive, comfortable spaces facilitate the sharing of Food and provide settings for sharing Food knowledge.

Oasis place is a concept for a town square that reconciles a wide range of health, social, ecological and environmental objectives. It creates a place that demonstrates the potential of Food to enhance the urban environment and contribute to the health, social, ecological and economic wellbeing of people who visit the square. It enables people to experience and learn about a Food producing landscape, participate in Food production and enjoy equitable access to good Food.

① Rooftop greenhouses to utilise unparalleled solar access.

② Buildings incorporating bee hives to facilitate apiculture.

③ "Vertical garden" of passionfruit vines or similar to provide landmark, help insulate buildings and facilitate air filtering as well as providing a Food source.

④ Buildings incorporating rain tanks to assist in maintaining a reliable supply of water.

⑤ Orchard trees incorporated into the square to celebrate productive landscapes and utilise their landscape potential to frame views and emphasise seasonal change.

⑥ Open space for use as a 'market festival' place amongst other celebrations.

⑦ Farmers market to provide an outlet for fresh Food and facilitate an extended range of Food shopping choices.

⑧ Good public transport to facilitate access to opportunities to grow Food and diminish demand for lands for roads, etc.

⑨ Water Sensitive Urban Design feature and interpretive material incorporated into town square to demonstrate how storm water treatment and its use in sustainable irrigation can provide an aesthetic and ecological asset.

⑩ Café showcasing local produce.

Figure 8. Integrating FSPUD principles into a public space.

① Raised community garden beds.

② Signage explaining purpose of the garden bed and what is grown there.

③ Rain garden to assist managing drainage

④ Extensive permeable surface.

⑤ Street trees selected to enhance ecological health and create a more attractive, walkable and comfortable streetscape.

⑥ Productive trees in front garden (where there will be fewer liability issues).

⑦ Water tanks to assist storm water capture.

⑧ Notice board to enable people to share information.

Figure 9. Some examples of streetscape measures implementing FSPUD principles.

Budget setting

The setting of council's annual budget identifies the areas for investment in the upcoming year and is a critical opportunity for getting funding for various Food-related initiatives. When setting this budget, planners interested in planning for Food might consider proposing the following:

- funding projects that improve the evidence base around the region's Food system to determine the most effective interventions
- preparing new strategies and policies to enable the *Local Planning Policy Framework* to integrate FSPUD characteristics in response to the specific issues of the locality
- funding capital works projects to create or improve assets enabling production, preparation, distribution, exchange or celebration of Food
- appointment of officers with capability to consider, and encourage, FSPUD in development applications and other council operations.

Cultivating culture change

Making sure that all the players in the development process and the wider community understand that promoting FSPUD is important will typically require a coordinated suite of strategies to complement changes to the planning scheme. This might include the following measures.

- Circulating this resource or a locally tailored version among planners and councillors.
- Hosting facilitated workshops and presentations with council staff to increase awareness and identify how FSPUD can be promoted throughout the council's sphere of responsibility.
- Securing funding for the preparation of promotional and educational campaigns that will promote access to Food.
- Identifying other areas (outside those under the planning sectors' sphere of control) that would support FSPUD objectives and open up discussions with the relevant responsible party to raise these issues. Examples of relevant parties include transport operators, traders groups, shopping centre managers, economic development officers and land holders. These people often hold 'informal assets', such as sweat equity (a willingness for people to roll their sleeves up, get involved and develop a sense of ownership of their surroundings) and emotional capital (the investment of care that drives people to participate in looking after their surroundings) that can be critical to seeing a project realised. Municipal Public Health and Wellbeing Plans provide useful examples of these efforts.
- Facilitating optimal active transport access to Food outlets, control over the type of outlet provided, and such measures as rural Food co-ops, municipal markets and Food depots.
- Recognising and actively supporting the activities of like-minded groups that are addressing these issues e.g. Transition Towns local groups.

Section 5. Case studies and precedents

A number of case studies have been selected to highlight the range of possibilities that arise from considering food in planning and urban design decisions. They range from exclusively commercial projects, through master planned communities designed to integrate Food, to council and community-led initiatives working to change how Food is produced, distributed and accessed.

Some of these opportunities may not be directly applicable in a Victorian or Australian context, and their inclusion is not intended to suggest that they could be implemented in exactly the same form here. These case studies have instead been selected to showcase the range of possibilities and highlight innovative responses in different situations, including cities that have much higher population densities or very different social and political contexts.

Even where they are not directly applicable to Victoria or Australia, the case studies may stimulate thinking and ideas about adaptations that are suitable here, or raise questions as to what barriers may need to be overcome for their uptake.

The information provided in the keys and assessments is indicative only. It is intended to suggest how the FSPUD framework could potentially be used for planning or assessing projects, identifying gaps and transferring ideas. Similarly, the scales and actors are provided to demonstrate the range showcased by these projects. They are the authors' suggestions, based on publically available information, however they may well be refined on closer investigation. Development of clear assessment criteria for categorising projects could be the subject of further work.

Matrix key

✓✓	two ticks means actively pursued
✓	one tick means occurs as a side effect
(No tick)	no tick means not as far as we know

▼ Section 5. Case studies and precedents

Baix Llobregat Agricultural Park[41, 42]

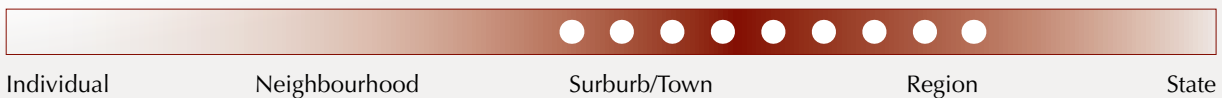Preserving and promoting sustainable peri-urban agriculture

Description

→ The Baix Llobregat Agricultural Park is located in the Llobregat Delta, 10 minutes west of Barcelona in Spain. The region has been the main supplier of fresh produce to Barcelona for many centuries.

→ The park was founded in 1998 by a diverse group of organisations seeking to ensure the continuity of sustainable agriculture on Barcelona's urban fringe in the face of increasing urban pressure. These organisations included the Provincial Council of Barcelona; the County Council of El Baix Llobregat; the Farmer's Union in Catalonia and the 14 municipalities that have land in the region.

→ The park is highly productive and contains 2,930 hectares of high-quality fruit and vegetable crops, in both open air and greenhouse production.

→ The park is also part of a broader framework of linked areas called the Network of Natural Spaces, managed by the Department of Natural Resources. It preserves the productive, ecological and cultural values of the agricultural area, and aims to develop its social, economic and environmental functions through:
  • efficiency of infrastructure and services in the agricultural land
  • improvement of the production, marketing and sales of agricultural products
  • modernisation of the farms
  • formation of a quality space in harmony with the natural surroundings and urban consolidation
  • disseminating knowledge on the natural and cultural heritage found in the park.

Matrix

	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food		✓✓	✓✓	✓✓
Processing and moving Food	✓✓		✓✓	
Consumer access and utilisation			✓✓	
Waste and re-use				

Scale

Individual — Neighbourhood — Surburb/Town — Region — State

Actors

☐ Individual
☑ Community
☐ Small business
☐ Commercial or developer
☐ NGO
☑ Peak body
☑ Local council
☑ Other government

Other info

☐ New
☑ Retrofit
☐ Urban
☑ Peri-urban
☐ Concept
☐ In development
☑ Exists

For more information

Parc Agrari del Baix Llobregat
http://diba.cat/parcsn/parcs/plana.asp?parc=9&m=297&o=1
http://www.youtube.com/watch?v=BLYckxmUXJQ&feature=BF&list=UL2moEEwcDj8Y&index=4

Prairie Crossing – a conservation community[43]

Integrates new residential settlement into ecosystem restoration and a commercial farming landscape

Description

→ A community in Grayslake, Illinois (US) that was designed to combine the preservation of open land, easy commuting by rail, and responsible development practices.

→ The land was purchased by a group of neighbours in 1987 and developed with the goal of preserving open land and agricultural production, while incorporating 359 new single-family homes and 36 condominiums.

→ Over 60% of the 677-acre site is protected open land, including 165 acres of restored prairies, 20 acres of restored wetlands, and 16 acres of historic hedgerows, that are actively used by people and wildlife. Ten miles of trails wind through this landscape.

→ Stormwater is filtered through prairies and wetlands and is stored in a lake that is both clean enough for swimming and stocked with endangered Minnows.

→ A certified organic farm, a 'learning farm' and seasonal on-site Farm Market provide residents with produce and a 'rural outlook'. Residents and the general public buy vegetables, fruits, flowers and other products such as honey and eggs.

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓	✓✓	✓✓
Processing and moving Food		✓		
Consumer access and utilisation	✓✓	✓✓		✓✓
Waste and re-use				

Scale

● ● ● ● ● ● ● ● ● ● ● ● ● ●

| Individual | Neighbourhood | Surburb/Town | Region | State |

Actors

☐ Individual ☑ Community

☑ Small business ☐ Commercial or developer

☐ NGO ☐ Peak body

☐ Local council ☐ Other government

Other info

☐ New ☑ Retrofit

☐ Urban ☑ Peri-urban

☐ Concept ☐ In development ☑ Exists

For more information

www.prairiecrossing.com/pc/site/about-us.html

The ABLE project – aquaponics [44]

Sustainable, commercial Food production, restoring urban sites and providing education/training opportunities
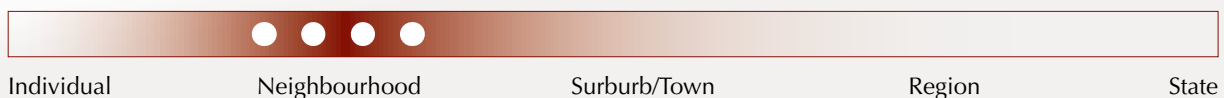
Description

→ The project revolves around the economic and ecological regeneration of a 34 acre former landfill site at Caldervale sewage treatment works in Wakefield, UK.

→ The ABLE project is a not-for-profit organisation set up by the ABLE Partnership Ltd with the Green Business Network, Yorkshire Water, Wakefield District Primary Care Trust and West Yorkshire Probation Service.

→ The project is based on aquaponics, which channels nutrient-rich fish waste to hydroponic growing beds, fertilising water-intensive plants in growing beds – working towards 'closed loop sustainability'.

→ The project is a sustainable fish-farming and horticulture operation, which has restored and used the site to:
• run a large-scale fish-farming operation, rearing sturgeon, ornamental and edible carp, catfish and, soon, tilapia, on a commercial basis
• provide fish to meet local community, minority and school demand
• provide accredited training and opportunities for children with special needs, who were being left behind in the current education system.

→ Shows how fish for human consumption can be produced at inland fisheries in a highly innovative way that simultaneously delivers significant added value (economic, environmental, health and social).

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓	✓✓	
Processing and moving Food				
Consumer access and utilisation	✓✓	✓		
Waste and re-use		✓✓	✓✓	

Scale

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

- ☐ Individual
- ☑ Community
- ☑ Small business
- ☐ Commercial or developer
- ☑ NGO
- ☐ Peak body
- ☐ Local council
- ☐ Other government

Other info

- ☐ New
- ☑ Retrofit
- ☑ Urban
- ☐ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

www.theableproject.org.uk

CERES farm and market[45]

Sustainable innovation in Food production and marketing, restoring urban sites and providing education/training opportunities
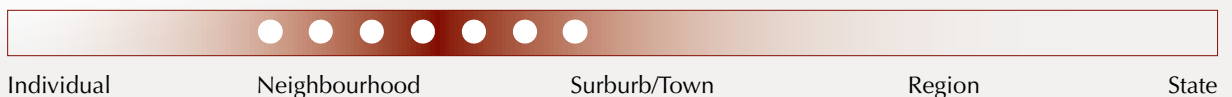
Description

→ The Centre for Education and Research in Environmental Strategies (CERES) site sits on 4.5 hectares (10 acres) in East Brunswick, close to the centre of Melbourne.

→ It includes a working urban farm in the heart of a densely populated residential area, which achieved organic certification despite being established on an old landfill site. It also manages an adjacent section of land for Food production and runs a market of its own (supplemented with additional external produce) twice a week. These employ 4 full-time and 22 part-time staff.

→ Other commercial operations include an organic seedling propagation centre, a nursery specialising in bush foods (Indigenous food-producing species) and other permaculture plants, and an organic café (60% of the produce used is grown at CERES).

→ CERES has also been a partner in establishing social enterprises, including a mushroom farm and a catering business, which are now becoming established commercially. A new aquaponics operation uses nutrients from fish production to grow greens for the market, and CERES Fair Food is currently operating a distribution system connecting Victorian farmers to Melbourne customers.

→ Seventy-five percent of CERES' income is generated by these and other enterprises.

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓	✓✓	✓✓
Processing and moving Food		✓✓	✓✓	
Consumer access and utilisation			✓✓	✓✓
Waste and re-use		✓✓		

Scale

Individual — Neighbourhood — Surburb/Town — Region — State

Actors

- ☐ Individual
- ☑ Community
- ☑ Small business
- ☐ Commercial or developer
- ☑ NGO
- ☐ Peak body
- ☐ Local council
- ☐ Other government

Other info

- ☐ New
- ☑ Retrofit
- ☑ Urban
- ☐ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

www.ceres.org.au

Anaerobic digestion of biowaste [46]

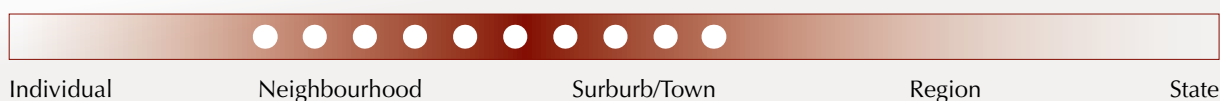Turning Food waste into energy and fertiliser

Description

→ After many years of pilot-scale research, the first full-scale Kompogas plant was built in 1991 in Rumlang, Switzerland. Kompogas now has at least 24 plants operating worldwide on biowaste or Organic Fraction Municipal Solid Waste (OFMSW), with more being built.

→ The first 9,000-tonne processing plant in Rumlang processes organic waste from a community of around 45,000 inhabitants, as well as waste from local catering, retail and agricultural industries.

→ The plant produces around 350 kg of solid residue and 450 L of liquid per tonne of waste. Around 50% of the output is liquid fertiliser and the solid waste is composted. Both solid and liquid products are used for agricultural purposes and more than 90% is used by farmers.

→ Around 100 m³ of biogas is produced per tonne of input, of which around 60% is methane.

→ The retailer Migros sends its vegetable waste to Kompogas and is using the biogas to power its trucks ('salad as fuel').

→ A similar plant has been installed in Otelfingen, near Zurich, which is also used as a 'showpiece' site. It has public compost pick-up and biogas filling stations, and is set up to demonstrate how organic waste processing 'closes the loop' through greenhouses, vegetable production, and animals (goats and fish) fed on products from the greenhouses.

Matrix

	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food		✓✓		
Processing and moving Food		✓✓		
Consumer access and utilisation				
Waste and re-use	✓✓	✓✓	✓✓	

Scale

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

- ☐ Individual
- ☐ Community
- ☑ Small business
- ☑ Commercial or developer
- ☐ NGO
- ☐ Peak body
- ☑ Local council
- ☐ Other government

Other info

- ☐ New
- ☑ Retrofit
- ☑ Urban
- ☐ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

www.kompogas.ch/en/index.html

Case study taken from: Estrada-Flores. Opportunities and challenges faced with emerging technologies in the Australian vegetable industry. Report for Horticulture Australia. 2009.

www.food-chain.com.au

▼ Section 5. Case studies and precedents

Yarra Valley Gateway Estate[47]

Taking advantage of peri-urban resources

Description

→ The Yarra Valley Gateway Estate is located in Coldstream, Victoria, a highly productive peri-urban agricultural region on the main highway out of Melbourne.

→ Gateway produces sun-ripened tomatoes, capsicum, lettuce, basil and eggplants in a highly automated and efficient 5,000 m² hydroponic greenhouse.

→ It also produces and sells its own value-added produce, including chutneys, sauces and aged beef, and wine from hand-pruned and tended vines.

→ Gateway produce is marketed direct to consumers through a 'farm gate' style shop at the front of the greenhouse. As it is located on a major highway out of Melbourne, it receives a high level of traffic.

→ The Gateway shop has been established to also act as a permanent outlet for a wide range of other local producers. Stock varies according to season, but can include locally grown berries, apples, stonefruit and seasonal vegetables. It also contains a wide range of value-added produce from the surrounding area, ranging from cheeses to biscuits and olive oil.

→ This business takes advantage of its location to produce high-quality produce in a limited area, but has also developed a diverse business to capture the broader value of local Food to local customers and passing visitors.

Image courtesy of Yarra Valley Gateway Estate

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food		✓✓	✓✓	
Processing and moving Food			✓✓	
Consumer access and utilisation				✓✓
Waste and re-use				

Scale

● ● ● ●

Individual Neighbourhood Surburb/Town Region State

Actors

- ☐ Individual
- ☐ Community
- ☑ Small business
- ☐ Commercial or developer
- ☐ NGO
- ☐ Peak body
- ☐ Local council
- ☐ Other government

Other info

- ☐ New
- ☑ Retrofit
- ☐ Urban
- ☑ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

www.gatewayestate.com.au

Alimentos Para Vida – Food4Life [48]

Preserving productive capacity and designing healthy and sustainable Food systems for new communities

Description

→ Arup consultants has proposed an integrated, intensive 45-hectare agricultural facility as a central feature of a new master-planned community for 40,000 people in Santiago, Chile.

→ The aim of the proposal is to produce approximately 50% of the fruit and vegetable requirements of the new community on-site.

→ All of the water and fertiliser requirements for this production will be sourced from domestic waste.

→ The proposal will provide about 700 jobs on-site for the new community of 40,000 people.

→ The 'Food story' will be a feature of the whole development with Harvest and Spring festivals, edible landscapes, community training centres, farming stalls and local organic produce in the local supermarket.

→ For additional information regarding Chile, see case study on greenbelts and reserves on page 46.
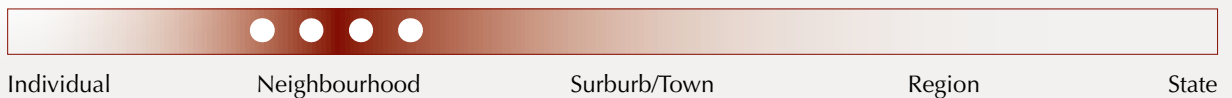

Image courtesy of ARUP

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food		✓✓	✓✓	✓✓
Processing and moving Food	✓✓	✓✓	✓✓	✓
Consumer access and utilisation		✓✓	✓✓	✓✓
Waste and re-use		✓✓		

Scale

Individual ● ● ● ● ● ● ● ● ● ● Neighbourhood ● ● ● Surburb/Town ● Region ● State

Individual   Neighbourhood   Surburb/Town   Region   State

Actors

☐ Individual
☐ Community
☐ Small business
☑ Commercial or developer
☐ NGO
☐ Peak body
☑ Local council
☑ Other government

Other info

☑ New
☐ Retrofit
☐ Urban
☑ Peri-urban
☐ Concept
☑ In development
☐ Exists

For more information

Velders M. Slim City: Making Food Systems Carbon and Resource Efficient. Nd. Arup, Melbourne.

Wanzhuang Eco City – Garden of Villages[48]

Preserving productive capacity and designing healthy and sustainable Food systems for new communities

Description

→ Wanzhuang is a proposed development on 80 square kilometres in China's Hebei Province, 45 km south-east of Beijing.

→ The new city will accommodate 340,000 people by 2025. It is being created on a site that currently encompasses 15 villages and 100,000 people.

→ The Arup Eco City is designed to embed horticultural production in the city and provide jobs for displaced farmers, preserving and enhancing local knowledge and farming skills.

→ The city will retain 3,500 hectares of farming land and use a model which provides a cluster of villages that share a town centre, and will be connected to the Beijing–Tianjin corridor. The compact, mixed-use development proposed around the existing

villages allows for the conservation of important productive land and agricultural heritage.

→ Ninety-nine percent of fresh fruit and vegetables required by the community will be produced in the city.

→ Every day, 36,000 m³ of treated wastewater would be produced, and the farmers need 30,000 m³ of

water. Matching this resource flow retains production without further groundwater depletion.
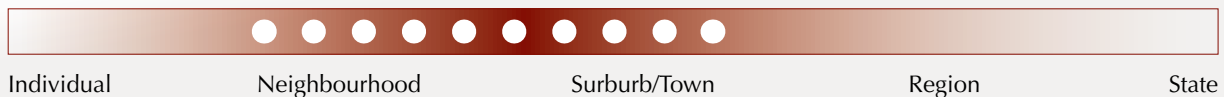
Image courtesy of ARUP

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓	✓✓	✓✓
Processing and moving Food		✓✓		
Consumer access and utilisation	✓✓	✓✓		
Waste and re-use		✓✓	✓	

Scale

| Individual | Neighbourhood | Surburb/Town | Region | State |

Actors

- ☐ Individual
- ☑ Community
- ☐ Small business
- ☑ Commercial or developer
- ☐ NGO
- ☐ Peak body
- ☑ Local council
- ☑ Other government

Other info

- ☑ New
- ☐ Retrofit
- ☐ Urban
- ☑ Peri-urban
- ☐ Concept
- ☑ In development
- ☐ Exists

For more information

Velders M. Slim City: Making Food Systems Carbon and Resource Efficient. Nd. Arup, Melbourne.

www.arup.com/Projects/Wanzhuang_Eco-city.aspx

Southlands – agricultural urbanism[49]

Community participation in master-planning for sustainable and productive neighbourhoods

Description

→ Southlands, British Columbia, Canada: Century Group owns a vast majority of the Southlands and has proposed a mixed-use project for the 530-acre area. It has established a Community Planning Team to work out how thoughtful development of the Southlands could improve outcomes for the community.
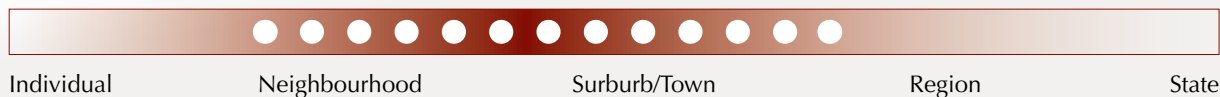
→ The proposal is to develop a third of the land as residential (1,800 to 2,000 homes), keeping a third for productive agricultural land, and using the other third for parks and civic amenities. This development would include the below.

• Rural agriculture: more than 220 acres of farmland will be managed by an agricultural land trust. This arrangement will enable the largest agricultural fields to be assembled into connected parcels on the northern part of the site, consistent with retaining the better soil capability.

• Extra-urban agriculture: agriculture and green wedges alternatively penetrating the built environment, to allow Food production and urban living to co-exist.

• Intra-urban agriculture: integrated farming and gardening options within the settlement area to offer all residents the opportunity to cultivate Food. This includes multi-family buildings equipped with window boxes and roof and balcony gardens; community gardens; and detached homes with private kitchen gardens and plots.

→ The development will also feature an agricultural precinct serving as the community's commercial centre, housing the principal civic and commercial food structures and gathering places.

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓	✓✓	✓✓
Processing and moving Food		✓✓	✓✓	
Consumer access and utilisation	✓✓	✓✓	✓	✓✓
Waste and re-use		✓✓		

Scale

Individual — Neighbourhood — Surburb/Town — Region — State

Actors

- ☐ Individual
- ☑ Community
- ☐ Small business
- ☑ Commercial or developer
- ☐ NGO
- ☑ Peak body
- ☑ Local council
- ☐ Other government

Other info

- ☑ New
- ☐ Retrofit
- ☐ Urban
- ☑ Peri-urban
- ☑ Concept
- ☐ In development
- ☐ Exists

For more information

http://imaginesouthlands.ca/

VicUrban Meridian development – public orchards

Integrating edible landscapes into new developments

Description

→ Numerous community benefits through the fruiting and seasonal orchards/plants in public open-space areas and on the nature strips beside the street (i.e. mini orchards in combination with amenity plants).

→ The urban orchard landscape is carefully integrated with the pedestrian and bicycle-friendly shared-zone streets. It includes swale drainage systems, stormwater harvesting and proposed recycled water from Melbourne Water's Eastern Treatment Plant.

→ The street and public open space orchard will be professionally managed and maintained by the Meridian Homeowners Association (MHA) – an incorporated association of residents funded through a $50 quarterly levy included in each household's rate notice.

→ All homeowners will become members of the MHA upon purchase of a lot; active participation will not be compulsory but will be encouraged.

→ The Association employs a community and landscape manager to manage maintenance requirements and work with residents to create an activity program to maintain the orchards and ensure the irrigation is fully operational.

Image courtesy of VicUrban

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓		✓✓
Processing and moving Food				
Consumer access and utilisation	✓✓	✓✓		✓✓
Waste and re-use		✓✓		

Scale

● ● ● ● ● ● ● ● ● ●

| Individual | Neighbourhood | Surburb/Town | Region | State |

Actors

- ☐ Individual
- ☐ Community
- ☐ Small business
- ☑ Commercial or developer
- ☐ NGO
- ☐ Peak body
- ☑ Local council
- ☑ Other government

Other info

- ☑ New
- ☐ Retrofit
- ☑ Urban
- ☐ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

www.vicurban.vic.gov.au

Local Food, farms and jobs: growing the Illinois economy [50, 51]

Creating livelihoods and opportunity through local Food

Description

→ Most of the $48 billion annually that Illinois consumers spend on food leaves the state. Increasing the production, distribution and exchange of local Food has been recognised as a significant economic development opportunity.

→ The Illinois *Food, Farms and Jobs Act 2007* established the 32-member Illinois Local and Organic Food and Farm Task Force, which then produced a report with policy and funding recommendations for the state of Illinois to facilitate development of a local Food system to complement the existing global farm and food system.

→ In 2009, this report was acted upon through the establishment of the Illinois *Local Food, Farms and Jobs Act*. This Act:
  • sets forth procurement goals for local farm or Food products (that 20% of all food and food products purchased by state agencies and state-owned facilities shall, by 2020, be local farm or Food product)
  • creates the Local Food, Farms and Jobs Council 'Local Food Council' – a not-for-profit corporation tasked with facilitating the growth of an Illinois-based local farm and Food product economy.

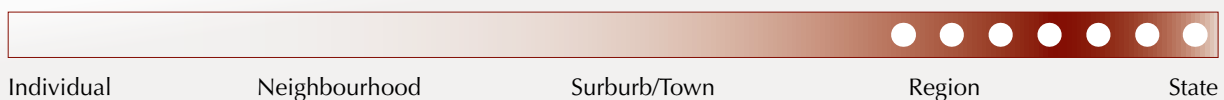→ Local farm or Food products are products grown, processed, packaged and distributed by Illinois citizens or businesses located wholly within the borders of Illinois.

Matrix

	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food			✓✓	
Processing and moving Food			✓✓	
Consumer access and utilisation			✓✓	
Waste and re-use			✓✓	

Scale

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

- ☐ Individual
- ☐ Community
- ☑ Small business
- ☐ Commercial or developer
- ☐ NGO
- ☐ Peak body
- ☐ Local council
- ☑ Other government

Other info

- ☐ New
- ☑ Retrofit
- ☑ Urban
- ☑ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

www.foodfarmsjobs.org

http://www.familyfarmed.org

▼ Section 5. Case studies and precedents

Greenbelts and reserves [52]

Identifying and protecting land for Food production

Description

Approaches to identification and protection of land for Food production vary significantly across different regions and countries. Examples of quite proactive approaches to planning for agricultural land and Food production include:

→ **Chile** – Soils of 'Agricultural High Priority' within Agriculture and Forestry zones are assessed according to current land use; land capability; quality and availability of irrigation water; climate conditions; market access; value of past investment, etc. Where new urban development applications affect land classified as 'agricultural high priority', a strategy to prevent or mitigate the loss of that land is considered as part of development approval (see Alimentos Para Vida, Santiago case study on page 41).
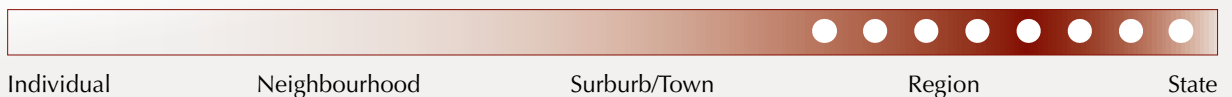
→ **Portland, Oregon** – Portland established an urban growth boundary in 1979, to protect farms and forests surrounding the metro area from urban sprawl and promote efficient use of land inside the boundary. A recent review suggests there may be a need to include a small additional area within the boundary, but maintained that it should be managed to protect farm and forest lands. Local governments have developed programs to support regional Food economies to strengthen the viability of producers and resist development pressure.

→ **British Colombia, Canada** – The BC Agricultural Land Reserve is a provincial zone covering 4.7 million hectares, in which agriculture is recognised as the priority use. It is protected through the *Agricultural Land Commission Act 2002*, which takes precedence over (but does not replace) other legislation and by-laws that apply to the land.

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food		✔✔	✔✔	✔✔
Processing and moving Food				
Consumer access and utilisation		✔✔	✔✔	
Waste and re-use		✔✔		

Scale

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

- ☐ Individual
- ☐ Community
- ☐ Small business
- ☐ Commercial or developer
- ☐ NGO
- ☐ Peak body
- ☑ Local council
- ☑ Other government

Other info

- ☐ New
- ☐ Retrofit
- ☐ Urban
- ☑ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

www.alc.gov.bc.ca/alr/alr_main.htm

Carter-Whitney. Ontario's Greenbelt in an International Context. Friends of the Greenbelt Occasional Papers, No. 11, February 2010.

Vancouver Food Policy Council[53]

Coordinated and strategic approach to planning for Food

Description

→ The Vancouver Food Policy Council (VFPC) comprises individuals from all sectors of the local Food system, including nutritionists, Food wholesalers and distributors, Food retailers and grocers, managers of non-profit organisations and academics engaged in the Food system.

→ It aims to build a Food system that is ecologically sustainable, economically viable and socially just, through collaboration between citizens and government officials.

→ There is now a wealth of resources assessing and explaining the Vancouver Food system. These have contributed to the strategic development of policies and programs to achieve change. Resources include:

- *City of Vancouver By-laws, Policies, Guidelines and Decisions Related to the Food System*
- *The Vancouver Food System Assessment Report*
- *City of Vancouver's Urban Agriculture Design Guidelines for the Private Realm*.
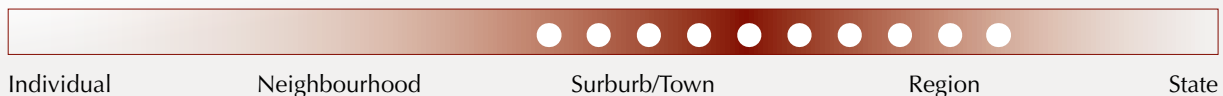
Examples of successes and current activities include:

- adoption of the *Vancouver Food Charter* in 2007
- supporting the development of community gardens and bee-keeping within Vancouver, including a site at the City Hall and a commitment to 2010 growing spaces by 2010
- amendment to by-laws enabling people to keep chickens within urban areas
- street vendor program that supports nutritious and culturally diverse curbside food provision.

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓	✓✓	✓✓
Processing and moving Food		✓✓	✓✓	
Consumer access and utilisation	✓✓	✓✓	✓✓	✓✓
Waste and re-use				

Scale

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

- ☐ Individual
- ☑ Community
- ☑ Small business
- ☐ Commercial or developer
- ☑ NGO
- ☐ Peak body
- ☑ Local council
- ☐ Other government

Other info

- ☐ New
- ☑ Retrofit
- ☑ Urban
- ☐ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

http://vancouver.ca/commsvcs/socialplanning/initiatives/foodpolicy/tools/links.htm#CityVFPCReports

Belo Horizonte – Food Security Program [54, 55, 56]

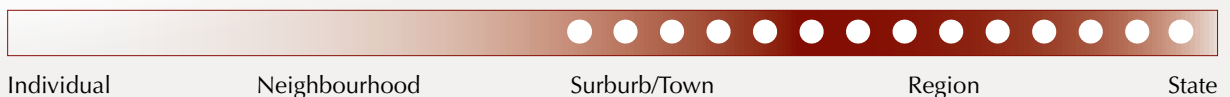Designing and implementing a new Food system to increase access to healthy Food

Description

→ This program is political acknowledgment of the citizens' right to Food and the duty of the government to guarantee this right. In 1993 Mayor Patrus Ananias created a Secretariat for Food Policy and Supply that included a 20-member council of citizens, workers, business leaders and church representatives to advise on the design and implementation of a new Food system.

→ A wide range of innovations were developed to assure everyone the right to Food, especially by weaving together the interests of farmers and consumers. Innovations included:

• Making choice locations of urban public space available to local family farmers, enabling direct sale to urban consumers, essentially redistributing retailer mark-ups on produce.

• Allowing entrepreneurs to bid on the right to use well-trafficked plots of city land for 'ABC' markets (Portuguese acronym for 'food at low prices'). The city determines a set price for about 20 healthy items, typically about two-thirds of the market price; everything else they can sell at market price. In return for these prime spots, they also have to deliver produce to poor neighbourhoods on weekends so that everyone has access.

• Three large 'people's restaurants', and some smaller ones, which serve more than 12,000 people a day, using mostly locally grown Food, for the equivalent of less than 50 cents a meal.

• Extensive school and community nutrition programs. Food sold at schools is also fresh local produce.

Matrix

	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓	✓✓	
Processing and moving Food	✓✓		✓✓	
Consumer access and utilisation	✓✓		✓✓	✓✓
Waste and re-use	✓✓	✓✓		

Scale

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

- ☐ Individual
- ☑ Small business
- ☐ NGO
- ☑ Local council
- ☐ Community
- ☐ Commercial or developer
- ☐ Peak body
- ☑ Other government

Other info

- ☐ New
- ☑ Urban
- ☐ Concept
- ☑ Retrofit
- ☑ Peri-urban
- ☐ In development
- ☑ Exists

For more information

www.worldfuturecouncil.org/fileadmin/user_upload/
PDF/Future_Policy_Award_brochure.pdf

www.worldfuturecouncil.org/future_policy_award_film_en.html

www.yesmagazine.org/issues/food-for-everyone/
the-city-that-ended-hunger

Rosario – urban agriculture[57]

Supporting urban agriculture (UA) for Food security

Description

→ Economic crises in Argentina reduced it from a country with a similar development level to Australia, to one with major social and economic challenges.

→ Rosario – a port city surrounded by a rich agricultural region (now mainly producing soybeans for export) – had 60% of the population living below the poverty line in 2001.

→ From 2001, the local government took action to significantly expand family and community gardening that targeted nutritional issues in poor families. The program aimed to:

• improve the Food security of poor families by bringing urban land into production, with secure tenancy

• establish an easy-to-manage system of production with rapid results (annual crops), without an ongoing dependence on external resources.

• produce healthy Food for family consumption
• establish direct sales in strategic locations in the city
• institutionalise the initiatives in public policy.

→ Policies and projects include:
• *Optimisation of the Use of Soil for Urban Agriculture*
• *Constructing Productive Neighbourhoods*
• productive spaces regulated by local laws
• multifunctional public spaces – vegetable garden park, productive squares, etc.

Image courtesy of P. Morgan

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓	✓✓	✓✓
Processing and moving Food	✓✓		✓✓	
Consumer access and utilisation	✓✓	✓✓		✓✓
Waste and re-use				

Scale

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

☐ Individual
☑ Community

☐ Small business
☐ Commercial or developer

☐ NGO
☐ Peak body

☑ Local council
☑ Other government

Other info

☐ New
☑ Retrofit

☑ Urban
☐ Peri-urban

☐ Concept
☐ In development
☑ Exists

For more information

Morgan P. Planning Productive Cities: Urban Agriculture Integrated into Urban Planning. 2007. Agri-Food XIV, University of Queensland, Brisbane.

Havana – urban agriculture[57]

Urban agriculture as public policy

Description

→ The Provincial Physical Planning Directorate of Havana identified unused land areas and set up a Provincial Commission to set guidelines for the establishment of urban agriculture and define conditions for agricultural use of urban land.

→ Municipal Work Committees were created to assist urban agriculture. This included:

- *Usufruct* – the legal right to use and derive benefit from a property that belongs to another person, provided that property is not damaged; this allowed broad access to vacant land for cultivation
- providing agricultural services into urban areas
- developing and legalising new forms of marketing, including stalls and farmers markets
- research into intensive methods of production in small spaces.

→ Outcome – a farming city:

- self-employment and career opportunities – 140,000 jobs created in the sector

- UA provides 50% of fresh vegetables for the city and utilises 12% of the land base in the city
- small patio spaces produced 326.9 million eggs, and 7.7 tons of poultry meat in 2000
- production ranges from family-level plots to state-run enterprises with employees
- supports other enterprises like worm farms, seed houses, consultancies and farmers markets.
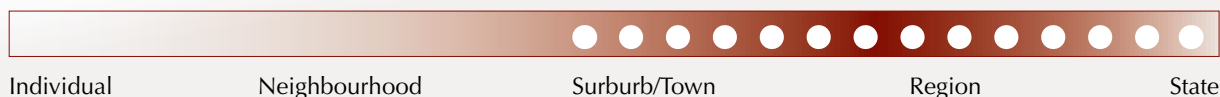

Image courtesy of P. Morgan

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓	✓✓	✓✓
Processing and moving Food	✓✓			
Consumer access and utilisation	✓✓	✓✓	✓✓	
Waste and re-use	✓✓	✓		

Scale

● ● ● ● ● ● ● ● ● ● ● ● ● ● ●

| Individual | Neighbourhood | Surburb/Town | Region | State |

Actors

- ☐ Individual
- ☑ Community
- ☑ Small business
- ☐ Commercial or developer
- ☐ NGO
- ☐ Peak body
- ☑ Local council
- ☑ Other government

Other info

- ☐ New
- ☑ Retrofit
- ☑ Urban
- ☑ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

Morgan P. Planning Productive Cities: Urban Agriculture Integrated into Urban Planning. 2007. Agri-Food XIV, University of Queensland, Brisbane.

VicHealth Food for All projects [58]

How local governments can intervene to improve Food security

Description

VicHealth's five-year Food for All Program involved eight Victorian local governments (covering nine Victorian municipalities taking a lead in addressing Food insecurity by improving access to healthy Food for people living in disadvantaged communities. These councils have developed practical and long-lasting strategies to tackle the problem of Food insecurity and help residents access a variety of nutritious Foods, including fruit and vegetables.

The Food for All Program has involved action by local government on many fronts:

→ enabling residents to identify local sources of fresh fruit and vegetables at affordable prices

→ ensuring that those in poor-quality housing have access to food storage and cooking facilities

→ improving Food and cooking knowledge and skills among disadvantaged groups

→ improving transport options for those without a car

→ increasing community awareness of the problem of Food insecurity.

A comprehensive evaluation of Food for All has identified 10 key learnings for local government to address the issue of Food insecurity. VicHealth launched 10 micro-movies showcasing each of these in June 2010, accompanied by '10 Key Ways' information sheets. These resources are available to be viewed and downloaded from the VicHealth website (see 'For more information' below).

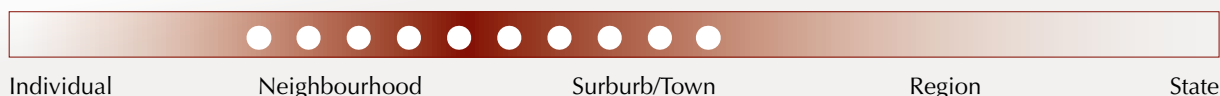## Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓			✓✓
Processing and moving Food	✓✓	✓✓		
Consumer access and utilisation	✓✓		✓✓	✓✓
Waste and re-use		✓✓		

Scale

● ● ● ● ● ● ● ● ● ●

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

- ☑ Individual
- ☑ Community
- ☐ Small business
- ☐ Commercial or developer
- ☐ NGO
- ☐ Peak body
- ☑ Local council
- ☑ Other government

Other info

- ☐ New
- ☑ Retrofit
- ☐ Urban
- ☐ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

www.vichealth.vic.gov.au

Wodonga land use planning[59]

Strategic planning that improves Food access

Description

→ The City of Wodonga was one of the Food for All projects funded by VicHealth (see previous case study). Its 2006 Municipal Strategic Statement contains 'Food security sympathetic' inclusions, particularly relating to small local activity centres (to enable Food access) in new residential developments.

→ New development and the formation of neighbourhoods will place an emphasis on achieving walkable neighbourhood catchments (as demonstrated on the North Leneva Structure Plan below), with:

- a convenience centre or focus for community activity, with provision for public transport, within a 400 m radius
- concentrations of higher residential densities around each neighbourhood.

→ Wodonga has also rezoned land to facilitate the development of more diverse shopping centres outside the town centre (formerly the only area where commercial activity was allowed).

Two new local supermarkets have now opened out of town, improving access to fresh Food for local residents in these areas.

→ The positive transformation and redevelopment of the Wodonga central business district will take place with new retail and activity nodes being street-based in preference to car-park based shopping malls.
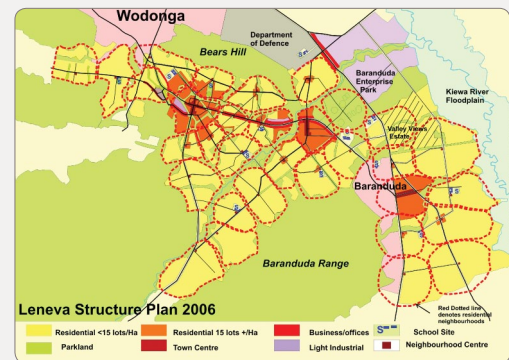
Image courtesy of Wodonga Council

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food				
Processing and moving Food				
Consumer access and utilisation	✓✓	✓✓	✓✓	✓✓
Waste and re-use				

Scale

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

- ☐ Individual
- ☐ Community
- ☐ Small business
- ☑ Commercial or developer
- ☐ NGO
- ☐ Peak body
- ☑ Local council
- ☐ Other government

Other info

- ☑ New
- ☑ Retrofit
- ☑ Urban
- ☐ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

www.dse.vic.gov.au/planningschemes/wodonga/home.html (select 21 – Municipal Strategic Statement)

Baw Baw Shire 'Active by Design' guidelines[60]

Designing for participation in Food production

Description

→ This project was undertaken to help Baw Baw Shire ensure that its emerging subdivisions encouraged people to walk or cycle, enabled them to meet their needs locally and supported a desirable quality of life.

→ A preliminary study identified the minimum standard of opportunities that should be available at different scales to support people's wellbeing. It considered how to 'build in' options so that people can choose from different activities, increasing their chances of finding something appropriate to their fitness and preferences. One of the opportunities identified was community gardens as both a source of healthy Food and an opportunity to participate in physical and social activity.

→ The output of the study was a set of guidelines that have now been adopted by the council.

→ The guidelines require that for a subdivision to be considered 'active by design', the people who will live there should be able to enjoy community gardens with a prescribed level of access. The gardens can be pre-existing or the developers can install or contribute towards new gardens, depending on the size of the development.

→ The guidelines also lay out primary and secondary qualities for community gardens to ensure they function well and meet other incidental qualities such as being aesthetically pleasing and accessible.
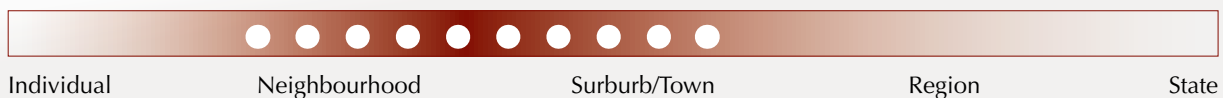
Matrix

	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓		✓✓
Processing and moving Food	✓✓			
Consumer access and utilisation	✓✓	✓✓		✓✓
Waste and re-use		✓		

Scale

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

- ☐ Individual
- ☐ Community
- ☐ Small business
- ☐ Commercial or developer
- ☐ NGO
- ☐ Peak body
- ☑ Local council
- ☐ Other government

Other info

- ☐ New
- ☐ Retrofit
- ☑ Urban
- ☐ Peri-urban
- ☑ Exists
- ☐ Concept
- ☐ In development

For more information

www.bawbawshire.vic.gov.au

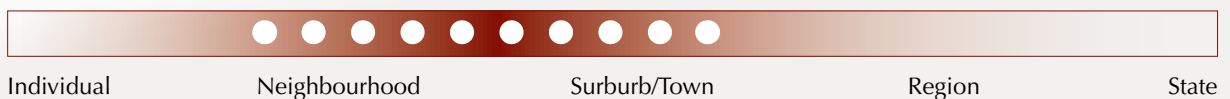# Melbourne municipal markets [61, 62, 63]

Icons of fresh produce

Description

→ The first fresh fruit and vegetable market was established in Melbourne in 1841. Known as the 'western market', it commenced with the election of eight leading citizens who were made market commissioners and controlled the market. In 1842, this control was transferred to the newly formed Melbourne Town Council.

→ Municipal markets in Melbourne are public markets managed by their respective local councils or private property owners. Many of these markets have existed since their inception in the nineteenth century, with few public markets opening since. They include the Queen Victoria, South Melbourne, Prahran, Preston and Dandenong Markets. Some are municipal owned (e.g. Queen Victoria Market) and some are privately owned (e.g. Preston Market).

→ Municipal markets serve as a central source and one-stop shop for people's grocery needs, including fresh fruit and vegetables, meat and dairy produce, and bakery and deli items.

→ They provide seasonal variation and also service particular cultural needs by providing Food stuffs, vegetables and fruits that may be less commonly found in other food outlets, such as Asian greens, halal butchers and an extensive range of deli items.

→ An example is the Dandenong Market:
  • established in 1866, it is one of Melbourne's oldest markets
  • in early 2010, it underwent an upgrade that has led to the provision of a large fresh Food section, increased fruit and vegetable space and a new General Merchandise Hall.

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food				
Processing and moving Food		✓	✓✓	
Consumer access and utilisation	✓✓	✓✓	✓✓	✓✓
Waste and re-use		✓	✓	

Scale

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

- ☐ Individual
- ☑ Community
- ☑ Small business
- ☑ Commercial or developer
- ☐ NGO
- ☐ Peak body
- ☑ Local council
- ☐ Other government

Other info

- ☐ New
- ☑ Retrofit
- ☑ Urban
- ☑ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

www.qvm.com.au

www.prahranmarket.com.au

www.vgavic.org.au/about_us/history/vga_beginnings.htm

US city and regional Food access projects[64]

Innovation improving access to healthy Food

Description

A range of cities and regions in the USA has developed innovative new approaches to improve access to healthy Foods.

→ **Los Angeles City Council** (2008) put a one-year ban on new fast food restaurants in one of the city's poorest areas, where 30% of children are obese (compared to a 21% average across the city). The moratorium was intended to give the city time to attract more grocery chains and fresh Food stores to open for business.

→ **Pennsylvania** (2003) passed a statewide economic development initiative to bring groceries and farmers' markets to underserved communities. Through a *Fresh Food Financing Initiative* (FFFI) they supported
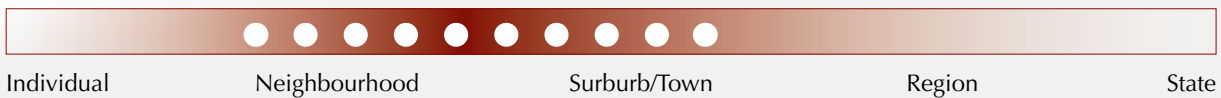
building 80 new stores in underserved rural and urban communities in the state (see Fresh Food Financing Initiative, Pennsylvania case study on page 56).

→ **Milwaukee** completed a Food System Assessment Study. Having identified a neighbourhood where 40% or more of the population earned incomes below the poverty level, they created the Fondy Food Center where 35 local farmers could sell their produce. The market installed technology to accept food stamps as payment for fresh produce.

→ **New York City** has a Green Carts program – Food carts that sell only fresh fruits and vegetables in neighbourhoods that lack access.

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food				✓✓
Processing and moving Food	✓✓	✓✓		
Consumer access and utilisation	✓✓		✓✓	✓✓
Waste and re-use	✓✓	✓✓		

Scale

Individual   Neighbourhood   Surburb/Town   Region   State

Actors

- ☐ Individual
- ☑ Community
- ☐ Small business
- ☐ Commercial or developer
- ☑ NGO
- ☑ Peak body
- ☑ Local council
- ☑ Other government

Other info

- ☐ New
- ☑ Retrofit
- ☑ Urban
- ☐ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

Access to Healthy Foods in Low-Income Neighborhoods: Opportunities for Public Policy.

www.yaleruddcenter.org/resources/upload/docs/what/reports/RuddReportAccesstoHealthyFoods2008.pdf

Fresh Food Financing Initiative [65, 66]

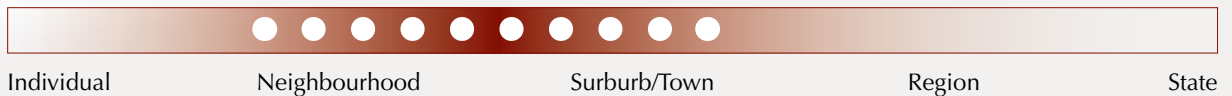Bringing groceries and farmers to underserved communities

Description

→ The Pennsylvania Fresh Food Financing Initiative is a state-wide economic development initiative that aims to attract fresh Food retailers to urban and rural underserved communities. [65]

→ 'The objectives of the program are to:
  • reduce the high incidence of diet-related diseases by providing healthy Food
  • stimulate investment of private capital in low-wealth communities
  • remove financing obstacles and lower operating barriers for fresh Food outlets in poor communities
  • create living-wage jobs
  • prepare and retain a qualified workforce.' [65]

→ The FFFI provides grants and loans to qualified food retailers to help meet costs. Funds may contribute to land acquisition, construction, equipment financing, capital grants for project funding gaps, and funding for workforce development.

→ Eligible stores:
  • are located in a low to moderate income census tract
  • provide a full selection of fresh Foods
  • locate in areas that are currently underserved.

→ By 2009 the scheme had brought an additional 5,000 jobs and 1.6 million square feet of fresh Food retail space to the state of Pennsylvania.

→ From 2010 this model has been adopted at a Federal level and is being rolled out across the United States.

Matrix

	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food				
Processing and moving Food				
Consumer access and utilisation	✓✓	✓✓	✓✓	✓✓
Waste and re-use				

Scale

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

☐ Individual	☑ Small business	☑ NGO	☑ Local council
☑ Community	☑ Commercial or developer	☐ Peak body	☐ Other government

Other info

☐ New   ☑ Urban   ☐ Concept
☑ Retrofit   ☐ Peri-urban   ☐ In development
☑ Exists

For more information

www.trfund.com/resource/downloads/Fresh_Food_Financing_Initiative_Comprehensive.pdf

http://www.thefoodtrust.org/pdf/FFFI%20Brief.pdf

Growing Power[67]

Inspiring communities to build sustainable Food systems
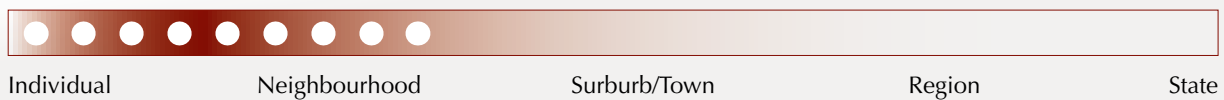
Description

→ Growing Power is a national non-profit organisation and land trust helping to provide equal access to healthy, high-quality, safe and affordable Food for people in all communities.

→ It provides people from diverse backgrounds with the resources, training, demonstration sites, technical assistance and outreach programs needed to develop community Food systems that help people grow, process, market and distribute Food in a sustainable manner.

→ Work includes:

• running and supporting urban farms and community gardens – Growing Power provides materials, assists in designing and building the space, provides daily staff and technical assistance

• soil production – advanced organic waste processing enables establishment of production anywhere within urban areas, e.g. Chicago garden has 36 biological worm-system raised beds built on top of concrete, producing fresh fruit and vegetables for the community

• farming in urban and traditional environments

• intensive all-weather systems, including aquaponics, greenhouses, etc.

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓	✓✓	✓✓
Processing and moving Food	✓	✓✓	✓	
Consumer access and utilisation	✓✓	✓✓	✓✓	✓✓
Waste and re-use		✓✓		

Scale

Individual	Neighbourhood	Surburb/Town	Region	State

Actors

- ☐ Individual
- ☑ Community
- ☑ Small business
- ☐ Commercial or developer
- ☐ NGO
- ☐ Peak body
- ☐ Local council
- ☐ Other government

Other info

- ☐ New
- ☑ Retrofit
- ☑ Urban
- ☑ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

www.growingpower.org

London Food Link – Capital Growth [68, 69, 70]

Matching unused space with unused skills for Food production
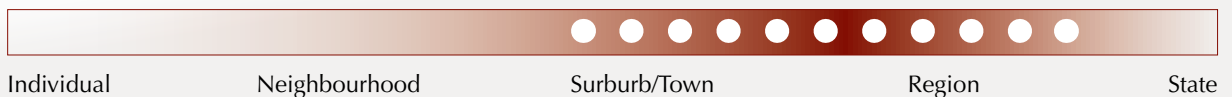
Description

→ London Food Link is a network of 285 organisations and individuals that work towards:
  • increasing the availability of sustainable Food in London
  • tackling the barriers preventing access to healthy and sustainable Food for all Londoners
  • protecting and celebrating London's diverse Food culture.

→ London Food Link has been running since 2001. Its activities include a quarterly newsletter called *The Jellied Eel*, influencing public and private supply chains, campaigning and contributing to food policy, and improving access to healthy and sustainable Food. Feature projects in 2009 included:
  • Capital Growth: working towards 2012 Food-growing spaces in London by 2012, the Capital Growth program matches spaces with people who wish to grow Food and provides information

and support. Additional funding supports social enterprises connected to Food production, and they have been trialling market stalls to sell London grown produce (including at Covent Garden).
  • Well London – BuyWell: supports community groups and businesses to make it easier to buy healthy, affordable and sustainably produced Food. For example the Buywell Retail Project, in 15 convenience stores across London, works with retailers in deprived areas to help them sell more healthy, affordable and sustainably produced fruit and vegetables.
  • Wholesale markets: working with wholesale markets to tackle issues around green procurement and waste.

→ Currently 30,000 people in London rent allotments to grow vegetables and fruit, and 14% of households grow vegetables in their garden.

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓	✓✓	✓✓
Processing and moving Food	✓✓	✓✓	✓✓	✓✓
Consumer access and utilisation	✓✓	✓✓	✓	✓✓
Waste and re-use		✓✓		

Scale

Individual — Neighbourhood — ● ● ● ● ● ● ● ● ● ● ● — Surburb/Town — Region — State

Actors

☐ Individual   ☐ Small business   ☑ NGO   ☑ Local council
☑ Community   ☐ Commercial or developer   ☐ Peak body   ☐ Other government

Other info

☐ New   ☑ Urban   ☐ Concept
☑ Retrofit   ☐ Peri-urban   ☐ In development
☑ Exists

For more information

www.sustainweb.org/londonfoodlink

www.capitalgrowth.org

http://www.foodforlondon.net

Social innovations in Food systems [71]

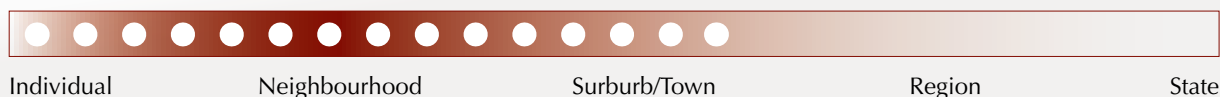Distributed responses and new solutions

Description

→ There are many new or emerging social practices, or small-scale 'movements', that have appeared in Melbourne as a response to many of the more apparent uncertainties or contradictions evident in the current practice of food provision. They fall under three categories: Improving the existing system; Consumer becomes (part) producer; and Actively designing new systems (see below for more information).

→ Often relatively informal and usually localised, these projects affect only a small proportion of the total food supply, but they reflect patterns of community thinking about issues and challenges in the food system.

→ **Improving the existing system**
  - Demand for 'greener and fairer' Food and new production systems
  - Distribution changes and reconnection of producers and consumers

  - Not-for-profit Food waste redistribution: SecondBite, FareShare, VicRelief FoodBank

→ **Actively designing new systems**
  - EcoMarkets (the supermarket that's not a supermarket); Fair Food; Vertical Farms
  - Food Sensitive Planning and Urban Design

→ **Consumer becomes (part) producer**
  - I eat what I sow: community, backyard and guerilla gardens; public orchards
  - I share what I grow: sharehoods; urban orchards; Grow and Share
  - New services and businesses: VEG, Book a Chook, community composting
  - Getting online: GrowLocal; HomeGrowers Exchange; aGrowingCommunity.org; sharedearth.com

Matrix

Matrix	Health and Fairness	Sustainability and Resilience	Livelihood and Opportunity	Community and Amenity
Producing Food	✓✓	✓✓	✓✓	✓✓
Processing and moving Food	✓✓	✓✓	✓✓	✓✓
Consumer access and utilisation	✓✓	✓✓	✓✓	✓✓
Waste and re-use	✓✓	✓✓	✓✓	✓✓

Scale

Individual　　　Neighbourhood　　　Surburb/Town　　　Region　　　State

Actors

- ☑ Individual
- ☑ Community
- ☑ Small business
- ☐ Commercial or developer
- ☑ NGO
- ☐ Peak body
- ☑ Local council
- ☑ Other government

Other info

- ☐ New
- ☑ Retrofit
- ☑ Urban
- ☑ Peri-urban
- ☐ Concept
- ☐ In development
- ☑ Exists

For more information

Edwards F. et al. Social Innovations in Victorian Food Systems, VEIL Briefing Paper. University of Melbourne, Victoria, 2010.

www.ecoinnovationlab.com
www.sustainablemelbourne.com/rdag

References

1. Castles H. Food and the City. Architectural Design, 2005; 75(3). Available from onlinelibrary. wiley.com/journal/10.1002/(ISSN)1554-2769. Accessed 30 September 2010.

2. Outer Suburban/Interface Services and Development Committee of Parliament. Inquiry into sustainable development of agribusiness in outer suburban Melbourne, 2010. Available from www.parliament.vic.gov. au/osisdc/inquiries/agribusiness/. Accessed 30 September 2010.

3. West S, Badham M. A Strategic Framework for Creating Liveable New Communities. Melbourne: Growth Areas Authority, 2008: March.

4. National Heart Foundation of Australia. Healthy by design: a planners' guide to environments for active living. Melbourne: National Heart Foundation of Australia, 2004. Available from www.heartfoundation.org.au/ SiteCollectionDocuments/Healthy%20by%20 Design.pdf. Accessed 30 September 2010.

5. Larsen K. Food Sensitive Urban Design. Presentation. Sydney: University of Sydney, Agri-Food XV conference, 2008: 25–29 November. Available from www. ecoinnovationlab.com/uploads/attachments/ 123_VEIL%20FSUD%20FINAL%20small.pdf. Accessed 30 September 2010.

6. Kickbusch I. Triggering debate – White Paper, The food system: a prism of present and future challenges for health promotion and sustainable development. Bern: Health Promotion Switzerland, 2010:July. Available from bit. ly/9wBwCk. Accessed 30 September 2010.

7. Victorian Government. Version No. 093, Planning and Environment Act 1987, No. 45 of 1987. Melbourne: Victorian Government, 2010: September, p.1. Available from www.legislation. vic.gov.au/. Accessed 26 October 2010.

8. Department of Planning and Community Development. Victorian Planning Provisions, State Planning Policy Framework. Melbourne: Victorian Government, 2010: September. Available from www.dpcd.vic.gov.au/planningschemes/VPPs/. Accessed 26 October 2010.

9. Australian Institute of Health and Welfare. Australia's Health 2006. Cat. No. AUS 73. Canberra: Australian Institute of Health and Welfare, 2006.

10. Victorian Health Promotion Foundation. Food Security – What is food insecurity? Melbourne: VicHealth, ND Available from www.vichealth.vic.gov.au/en/Programs-and- Projects/Healthy-Eating/Food-Security.aspx. Accessed 30 September 2010.

11. Victorian Health Promotion Foundation. Food for All – how local government is improving access to nutritious food. Melbourne: VicHealth. 2008. Available from www.vichealth.vic.gov.au/~/media/ResourceCentre/PublicationsandResources/healthy%20eating/food_for_all_web_singlepages.ashx. Accessed 30 September 2010.

12. Thornton LE, Bentley RJ, Kavanagh AM. Fast food purchasing and access to fast food restaurants: a multilevel analysis of VicLANES. Internat J Behav Nutr Phys Activ 2009; 6:28.

13. Kavanagh A, Thornton L, Tattam A, et al. Place does matter for your health: Victorian Lifestyle and Neighbourhood Environment Study. Melbourne: University of Melbourne, 2007. Available from www.kcwh.unimelb.edu.au/__data/assets/pdf_file/0005/55085/VicLanes_Report.pdf. Accessed 30 September 2010.

14. Ball K, Timperio A, Crawford D. Neighbourhood socioeconomic inequalities in food access and affordability. Health and Place 2009; 15(2):578–85.

15. Engels B, Nissim R, Landvogt K. Under pressure: costs of living, financial hardship and emergency relief in Victoria. Victoria: Victorian Council of Social Service and Emergency Relief Victoria, 2009. Available from www.vcoss.org.au/documents/VCOSS%20docs/Emergency%20Relief/ER%20report-Final_withCover.pdf. Accessed 30 September 2010.

16. Lenzen M. The influence of lifestyles on environmental pressure. University of Sydney, printed in Australian Bureau of Statistics 2002, Year Book Australia, Cat. No. 1301.0, Canberra: Australian Bureau of Statistics, 2002.

17. Australian Conservation Foundation. Consuming Australia – main findings. Sydney: Australian Conservation Foundation, 2007. Available from www.acfonline.org.au/uploads/res_Atlas_Main_Findings.pdf. Accessed 30 September 2010.

18. Department of Sustainability and Environment, Victoria. Metropolitan waste and resource recovery strategic plan. Melbourne: Department of Sustainability and Environment, 2009.

19. CSIRO. Fact Sheet: Learning to adapt to future climates. Melbourne: CSIRO, 2009. Available from www.csiro.au/resources/Learning-To-Adapt--ci_pageNo-2.html. Accessed 30 September 2010.

20. Climate Adaptation Science and Policy Initiative. Evidence of accelerated climate change. Sydney: The Climate Institute, 2007.

21. Larsen K et al. Sustainable and secure food systems for Victoria: What do we know? What do we need to know? VEIL Research Report no. 1. Melbourne: University of Melbourne, Victorian Eco-Innovation Lab, 2008. Available from www.ecoinnovationlab.com/uploads/attachments/018_VEIL_Food_Report_-_Full.pdf. Accessed 30 September 2010.

22. Australian Bureau of Statistics. Principal agricultural commodities, Australia 2007–08. Cat. No. 7111.0, Canberra: Australian Bureau of Statistics, 2008.

23. Department of Primary Industries, Victoria. Dry seasonal conditions in rural Victoria. Report No. 86. Victoria: Department of Primary Industries, 2009.

24. Froggatt A, Lahn G. White paper: Sustainable energy security – strategic opportunities and risks for business, 2010. London: Chatham House - Lloyds 360 Risk Insight, 2010. Available from www.chathamhouse.org.uk/files/16720_0610_froggatt_lahn.pdf. Accessed 30 September 2010.

25. Buxton M, Goodman R. Monograph: Maintaining Melbourne's Green Wedges: Planning Policy and the Future of Melbourne's Green Belt. Melbourne: RMIT University 2002 pp76.

26. National Farmers Federation and NSW Farmers Association. Submissions to the Inquiry into pricing and supply arrangements in the Australian and global fertiliser market, 2010. Submission 20 (page 5) and Submission 4 (pages 10–11). Available from www.aph.gov.au/Senate/committee/agric_ctte/fertiliser/report/c02.htm. Accessed 30 September 2010.

27. Crockett J et al. Feasibility study for a dry composting toilet and urine separation demonstration project. Melbourne: GHD, 2004. Available from www.ghd.com/pdf/CompostingToilets.pdf. Accessed 30 September 2010.

28. Jönsson H. Urine separation – Swedish experiences. EcoEng Newsletter 1. 2001. Wolhusen, Switzerland: International Ecological Engineering Society, 2001. Available from themas.stowa.nl/Uploads/nieuwe%20sanitatie/ Informatie/Bibliotheek/Overig/ervaring%20 met%20urineseparatie.pdf. Accessed 30 September 2010.

29. Stokes J, et al. Comparisons between applied biosolids and inorganic fertiliser under canola production in a red Dermosol in northeast Victoria, Australia. Poster. SuperSoil 2004. Sydney: The Regional Institute Ltd., 2004. Available from www.regional.org.au/au/asssi/ supersoil2004/s7/poster/1634_surapanenia. htm. Accessed 30 September 2010.

30. Planning Institute Australia. Healthy spaces and places. Canberra: Planning Institute of Australia, 2009. Available from www.healthyplaces.org. au. Accessed 30 September 2010.

31. Planning Institute Australia. About planning. Canberra: Planning Institute of Australia, 2010. Available from www.planning.org.au/index. php?option=com_content&task=view&id=684 &Itemid=618. Accessed 30 September 2010.

32. Barker-Reid F, Faggian R. Health benefits of community gardens and their potential to create links between urban and rural communities. From Margins to Mainstream: 5th World Conference on the Promotion of Mental Health and the Prevention of Mental and Behavioural Disorders. Presentation and abstract. Melbourne: World Federation for Mental Health, 2008:10–12 September.

33. Alaimo K, et al. Fruit and vegetable intake among urban community gardeners. J Nutr Educat Behav 2008; 40(2): 94–101.

34. Bell J, Standish M. Building healthy communities through equitable food access. Community Development Investment Review, Vol 5, Issue 3. San Francisco: Federal Reserve Bank of San Francisco, 2009. Available from www.frbsf.org/publications/community/review/ vol5_issue3/bell_standish.pdf. Accessed 30 September 2010.

35. Coutts A.M, et al. The urban heat island in Melbourne: drivers, spatial and temporal variability, and the vital role of stormwater. Melbourne: Monash University, 2009. Available from www.arts.monash.edu.au/ ges/staff/jberinger/pubs/stormwater2009.pdf. Accessed 30 September 2010.

36. Department of Planning and Community Development, Victoria. Victorian Planning Provisions, Local Planning Policy Framework. Clause 20.01. Melbourne: Victorian Government, 2010: September. Available from www.dpcd.vic.gov.au/planningschemes/VPPs/. Accessed 26 October 2010.

37. VicHealth. Regulatory and fiscal power. Using Council regulatory and fiscal powers to drive change. Information sheet series: Ten ways local government can act on food security. Melbourne: VicHealth, 2010. Available from www.vichealth.vic.gov.au/~/media/ ResourceCentre/PublicationsandResources/ healthy%20eating/Food%20for%20All-%20 resources%20for%20local%20govt/VHP%20 food%20for%20all_CMYK%20003-HE5.ashx. Accessed 30 September 2010.

38. National Heart Foundation of Australia. A Healthier Serve, The Heart Foundation's Guide to healthier catering. Melbourne: National Heart Foundation of Australia, 2010. Also view Healthier catering webpage and links to tools for community groups, foodservice, workplaces and commercial caterers. Available at http://www. heartfoundation.org.au/sites/HealthyEating/ healthiercatering/Pages/default.aspx. Accessed 30 September 2010.

39. Newman P, Kenworthy J. Sustainability and cities: Overcoming automobile dependence. Washington, DC: Island Press, 1999. Available from en.wikipedia.org/wiki/ Special:BookSources/1559636602. Accessed 30 September 2010.

40. Department of Human Services, Victoria. Environments for Health Planning Framework. Melbourne: Government of Victoria, 2001. Available from www.health.vic.gov.au/ localgov/mphpfr/index.htm. Accessed 30 September 2010.

41. Terricabras Maranges R. The Baix Llobregat Agricultural Park (Barcelona) agriculture for the future in a high-quality peri urban area. Barcelona: Fedenatur, n.d. Available from www.fedenatur.org/docs/docs/158.pdf. Accessed 30 September 2010.

42. Diputacio Barcelona. Parc Agrari del Baix Llobregat. Barcelona: Diputacio Barcelona, nd. Available from http://diba.cat/parcsn/parcs/plana.asp?parc=9&m=297&o=1. Accessed 30 September 2010.

43. Prairie Crossing – A Conservation Community. Illinois: Prairie Crossing, nd. Available from www.prairiecrossing.com/pc/site/about-us.html. Accessed 30 September 2010.

44. The Able Project. England, Wakefield: The Able Project, 2010. Available from www.theableproject.org.uk. Accessed 30 September 2010.

45. Larsen K , Barker-Reid F. Adapting to Climate Change and Building Urban Resilience in Australia. The Netherlands: Urban Agriculture Magazine, 2009: 22. Available from www.ruaf.org. Accessed 30 September 2010.

46. Estrada-Flores S. Opportunities and challenges faced with emerging technologies in the Australian vegetable industry. Report for Horticulture Australia, 2009. Sydney: Horticulture Australia, 2009.

47. Yarra Valley Gateway Estate. Victoria, Coldstream: Yarra Valley Gateway Estate, 2010. Available from www.gatewayestate.com.au/. Accessed 30 September 2010.

48. Velders M. Slim city: making food systems carbon and resource efficient. Brisbane: Arup, c.2009.

49. Century Group. Southlands. British Columbia, South Delta: Century Group, 2010. www.imaginesouthlands.ca/. Accessed 30 September 2010.

50. The Illinois Local and Organic Food and Farm Task Force. Local Food, Farms and Jobs: Growing the Illinois Economy, A Report to the Illinois General Assembly. Oak Park: The Illinois Local and Organic Food and Farm Task Force, 2009: March. Available from www.foodfarmsjobs.org/. Accessed 30 September 2010.

51. Family Farmed. FamilyFarmed.org. Oak Park: FamilyFarmed.org, 2010. Available from www.familyfarmed.org/.. Accessed 30 September 2010.

52. Carter-Whitney M. Ontario's greenbelt in an international context. Friends of the Greenbelt Occasional Papers. 2010: No. 11, February.

53. City of Vancouver Food Policy Council. Reports and resources on Vancouver's food system. Vancouver: City of Vancouver, 2009. Available from vancouver.ca/commsvcs/socialplanning/initiatives/foodpolicy/tools/links.htm#CityVFPCReports. Accessed 30 September 2010.

54. Göpel M. Celebrating the Belo Horizonte. Food Security Programme. Future Policy Award 2009: Solutions for the Food Crisis. Hamburg: World Future Council, 2009. Available from www.worldfuturecouncil.org/fileadmin/user_upload/PDF/Future_Policy_Award_brochure.pdf. Accessed 30 September 2010.

55. Film about Belo Horizonte's food policy. Future Policy Award Film. Hamburg: World Future Council, ND. Available from www.worldfuturecouncil.org/future_policy_award_film_en.html. Accessed 30 September 2010.

56. Moore Lappé F. The City that Ended Hunger. A city in Brazil recruited local farmers to help do something U.S. cities have yet to do: end hunger. Bainbridge Island, Washington: Yes Magazine, 2009: February 13. Available from www.yesmagazine.org/issues/food-for-everyone/the-city-that-ended-hunger. Accessed 30 September 2010.

57. Morgan P. Planning productive cities: urban agriculture integrated into urban planning. Presentation prepared for the Agri-Food XIV Conference. Brisbane: University of Queensland, 2007.

58. VicHealth. Food for All: resources for local governments. Melbourne: VicHealth, 2010. Available from www.vichealth.vic.gov.au/en/Resource-Centre/Publications-and-Resources/Healthy-Eating/Food-for-All/Food-For-All---Resources-for-Local-Governments.aspx. Accessed 30th September 2010.

59. Department of Planning and Community Development, Victoria. Wodonga planning scheme: municipal strategic statement. Select 21: Municipal Strategic Statement. Melbourne: Victorian Government, 2008. Available from www.dse.vic.gov.au/planningschemes/wodonga/home.html. Accessed 22 October 2010.

60. David Lock Associates. Active by design: subdivision guidelines and checklist for residential development. Warrigal: Baw Baw Shire Council, 2009.

61. Queen Victoria Market. Melbourne: Queen Victoria Market, nd. Available from www.qvm.com.au. Accessed 30 September 2010.

62. Prahran Market. Melbourne: Prahran Market, 2007. Available from www.prahranmarket.com.au. Accessed 30 September 2010.

63. Vegetables Victoria. VGA beginnings. Melbourne: Vegetables Growers of Victoria Inc., 2010. Available from www.vgavic.org.au/about_us/history/vga_beginnings.htm. Accessed 30 September 2010.

64. Yale Rudd Centre for Food Policy and Obesity. Access to healthy foods in low-income neighbourhoods: Opportunities for public policy. Connecticut: Yale University, 2008. Available from www.yaleruddcenter.org/resources/upload/docs/what/reports/RuddReportAccesstoHealthyFoods2008.pdf. Accessed 30 September 2010.

65. The Reinvestment Fund. Pennsylvania Fresh Food Financing Initiative. Philadelphia: The Reinvestment Fund, 2010. Available from www.trfund.com/resource/downloads/Fresh_Food_Financing_Initiative_Comprehensive.pdf. Accessed 30 September 2010.

66. The Reinvestment Fund. Pennsylvania Fresh Food Financing Initiative. Providing healthy food choices to Pennsylvania's Communities. Philadelphia: The Reinvestment Fund, 2007 Available from www.thefoodtrust.org/pdf/FFFI%20Brief.pdf. Accessed 30 September 2010.

67. Growing Power Inc. Available from www.growingpower.org. Milwaukee: Growing Power Inc., 2010. Accessed 30 September 2010.

68. Sustainweb. London Food Link. London: Sustain, 2010. Available from www.sustainweb.org/londonfoodlink. Accessed 30 September 2010.

69. Capital Growth. London: Capital Growth, 2010. Available from www.capitalgrowth.org. Accessed 30 September 2010.

70. London Food. Food for London. London: Food For London, 2010. Available from www.foodforlondon.net Accessed 30 September 2010.

71. Edwards F, et al. Social innovations in Victorian food systems: VEIL Briefing Paper. Melbourne: University of Melbourne, 2010.

72. Department of Human Services, Victoria. Victorian burden of disease study: Mortality and morbidity study 2001. Melbourne: Department of Human Services, Victoria, 2005. Available from www.health.vic.gov.au/healthstatus/bodvic/bod_current.htm. Accessed 30 September 2010.

73. SIGNAL and the National Vegetables and Fruit Coalition. Eat more vegetables and fruit: the case for a five-year campaign to increase more fruit and vegetable consumption in Australia, Part 1: Business Case. Canberra: SIGNAL and the National Vegetables and Fruit Coalition, 2002.

74. National Heart Foundation of Australia. Q&A: Dietary fats, dietary cholesterol and heart health. Melbourne: National Heart Foundation of Australia, 2009. Available from www.heartfoundation.org.au/SiteCollectionDocuments/DietaryFats%20QA%20FINAL.pdf. Accessed 30 September 2010.

75. National Heart Foundation of Australia. Position statement. The relationships between dietary electrolytes and cardiovascular disease. Questions and Answers – Health Professionals. Melbourne: National Heart Foundation of Australia, 2006. Available from www.heartfoundation.org.au/SiteCollectionDocuments/NHFA%20Dietary%20Electrolytes%20CVD%20QA-Health%20Prof.pdf. Accessed 30 September 2010.

76. BIS Shrapnel. Foodservice in Australia 2007. Volume 1: Market insights and market size. Sydney: BIS Shrapnel, 2007.

77. Freshlogic Mealpulse panel. Personal communication, August 2010.

78. Burns C. A review of the literature describing the link between poverty, food security and obesity with specific reference to Australia. Food Insecurity Program. Melbourne: Victorian Health Promotion Foundation, 2004. Available from www.tehotumanawa.org.nz/documents/File/Nutrition%20General/A_review_of_the_literature_describing_the_link_between_poverty_food_insecurity_and_obesity_with_specific_reference_to_Australia.pdf. Accessed 30 September 2010.

79. McCaughey Centre, School of Population Health and University of Melbourne. Community indicators Victoria. Melbourne: VicHealth, 2008. Available from www.communityindicators.net.au. Accessed 14 August 2008.

80. VicRelief Foodbank. Pushing the boundaries of hunger in Victoria. A report prepared by VicRelief Foodbank on the growing demand for emergency food relief among vulnerable and marginalised Victorians. Melbourne: VicRelief Foodbank, 2008.

81. Beaulac J, Kristjansson E, Cummins S. A systematic review of food deserts, 1966–2007. Prev Chronic Dis 2009; 6(3). Available from www.cdc.gov/pcd/issues/2009/jul/08_0163.htm. Accessed 30 September 2010.

82. Timperio A, Ball K, Roberts R, et al. 2008. Children's fruit and vegetable intake: association with the neighbourhood food environment. Prev Med 2008; 46(4): 331–335.

83. Maribyrnong City Council. Fruit and veg for all. Melbourne: Maribyrnong City Council, 2009. Available from www.maribyrnong.vic.gov.au/Page/page.asp?Page_Id=2113. Accessed 30 September 2010.

84. Barrat J et al. A Material Flow Analysis and Ecological Footprint of York: Technical Report. Sweden: Stockholm Environment Institute, 2002.

85. CSIRO. Water availability in the Murray–Darling Basin: Summary of a report from CSIRO to the Australian Government. Murray-Darling Basin Sustainable Yields Project. Canberra: CSIRO, 2008. Available from www.csiro.au/files/files/pna0.pdf. Accessed 30 September 2010.

86. International Energy Agency. World energy outlook 2009: Presentation to the press. London: International Energy Agency, 2009. Available from www.iea.org/speech/2009/Tanaka/WEO2009_Press_Conference.pdf. Accessed 30 September 2010.

87. Australian Petroleum Production and Exploration Association. Key statistics 2010. Canberra: Australian Petroleum Production and Exploration Association, 2008. Available from www.appea.com.au/images/stories/Publications/Key_Stats_2010_lores.pdf. Accessed 30 September 2010.

88. Australian Bureau of Agricultural and Resource Economics. Energy in Australia: 2008.Australian Bureau of Agricultural and Resource Economics for Department of Resources, Energy and Tourism. Canberra: Commonwealth of Australia, 2008. Available from www.abareconomics.com/publications_html/energy/energy_08/energyAUS08.pdf. Accessed 30 September 2010.

89. Dodson J et al. Assessing the impact of rising petroleum prices on agricultural production in rural and regional Australia. Proceedings of the Planning Institute of Australia (Queensland) Annual Conference. Longreach Queensland: Planning Institute of Australia (Queensland),2008.

90. Wood R et al. A comparative study of some environmental impacts of conventional and organic farming in Australia. Agricultural Systems 2006; 89(2–3):324–48.

91. Pimentel D, Giampietro M. Highlights of: Food, land, population and the U.S. economy. Washington, D.C.: Carrying Capacity Network, 1994. Available from dieoff.org/page40.htm. Accessed 30 September 2010.

92. PropertyOz. Myth #4: Increasing house sizes mean urban sprawl. Sydney: Property Council of Australia, 2010. Available from www.propertyoz.com.au/Article/Resource.aspx?media=461. Accessed 30 September 2010.

93. Australian Bureau of Statistics. Population projections, Australia, 2006 to 2101. Cat. No. 3222.0. Canberra: Australian Bureau of Statistics, 2008. Available from www.abs.gov.au/Ausstats/abs@.nsf/mf/3222.0. Accessed 30 September 2010.

94. Melbourne Water. Water use. Melbourne: Melbourne Water, 2010. Available from www.melbournewater.com.au/content/water_conservation/water_use/water_use.asp?bhcp=1. Accessed 30 September 2010

95. City of Melbourne. Total watermark: City as a catchment. Melbourne: Melbourne City Council, 2009. Available from .www.melbourne.vic.gov.au/Environment/WhatCouncilisDoing/Documents/city_as_catchment.pdf. Accessed 30 September 2010.

96. Walsh C. The water we should be using first. Little Stringybark Creek Project. Melbourne: University of Melbourne, 2009. Available from www.urbanstreams.net/Rpad/melbrunoff.html. Accessed 30 September 2010.

Useful resources

International

- Agricultural urbanism and municipal supported agriculture: A new food system path for sustainable cities. White paper prepared for the Surrey Regional Economic Summit 8/30/2008. Available from http://www.cityfarmer.org/agricultural_urbanism.pdf. [accessed 30 September 2010]

- American Planning Association. Policy guide on community and regional food planning. Available from http://myapa.planning.org/policyguides/food.htm. [accessed 30 September 2010]

- Delaware Valley Regional Planning Commission. Municipal Implementation Tool #018 – Food System Planning, 2010. Available from http://www.dvrpc.org/asp/pubs/publicationabstract.asp?pub_id=MIT018. [accessed 30 September 2010]

- Mougeot LJA. Agropolis: the social, political and environmental dimensions of urban agriculture. London: Earthscan Publishing, 2005.

- National Policy and Legal Analysis Framework for Childhood Obesity. Food system resources. Available from http://nplanonline.org/product_search/%2A/52. [accessed 30 September 2010]

- Steel C. Hungry city: how food shapes our lives. London: Vintage, 2009. Available from http://www.hungrycitybook.co.uk/.[accessed 30 September 2010]

- Sturm College of Law, Denver University. Sustainable community development codes. Chapter on: Food Production and Security. Available from http://www.law.du.edu/index.php/rmlui/programs/sustainable-community-development-code/sustainable-community-development-code-beta-version-12. [accessed 30 September 2010]

- United States Department of Agriculture. Local food systems: concepts, impacts, and issues. USDA, Economic Research Service, Economic Research Report, no. 97, May 2010 (Martinez et al). Available from www.ers.usda.gov/Publications/ERR97/ERR97.pdf. [accessed 30 September 2010]

- Viljoen A (ed). Continuous productive urban landscapes (CPULs): designing urban agriculture for sustainable cities. Oxford: Architectural Press, 2005.

- White House Task Force on Childhood Obesity. Solving the problem of childhood obesity within a generation. Report to the President, 2010. Available from http://www.letsmove.gov/taskforce_childhoodobesityrpt.html. [accessed 30 September 2010]

Australian

- Budge T, Slade C. Integrating land use planning and food security. A report for the Victorian Local Governance Association, 2009. Available from http://www.vlga.org.au/site/DefaultSite/filesystem/documents/Land%20Use%20Planning/INT%202009%20Oct%208%20VLGA%20Report%20on%20Food%20Security_Final.pdf. [accessed 30 September 2010]

- Queensland Government. Active, healthy communities: a resource package for local government to create supportive environments for physical activity and healthy eating. Developed by the Heart Foundation, Queensland Health and the Local Government Association of Queensland, 2010. Resource package available from http://www.activehealthycommunities.com.au. [accessed 30 September 2010]

- Sullivan R. Local food for sustainable communities. ECOS Magazine, CSIRO, Dec–Jan 2010. Available from http://www.ecosmagazine.com/?act=view_file&file_id=EC152p18.pdf. [accessed 30 September 2010]

- Thornton L and Kavanagh A. The local food environment and obesity. In: Pearce J and Witten K. Geographies of Obesity: Environmental Understandings of the Obesity Epidemic. England: Surrey, Ashgate, 2010.

Appendices

Appendix 1. Problems in the food system today

Problem	Evidence
Chronic disease For many people in Australia, the food being consumed is contributing to alarmingly high levels of disease.	• Cardiovascular diseases and cancer contribute to the largest burden of disease and injury in Victoria, together accounting for about 39% of the total burden.[72] • Several nutrition-related risk factors together accounted for the largest burden of disease attributable to risk factors in Victoria in 2001.[72] This includes the burden from obesity (8%), high blood pressure (7.3%), high cholesterol (6.1%), inadequate fruit and vegetable intake (3.3%) and alcohol (1.5%). • Only 7.7% of Victorian females and 3.1% of males meet the recommended healthy eating guidelines for both fruit and vegetable consumption.[72] • Eating more fruit and vegetables may be the single most important dietary change needed to reduce the risk of cardiovascular disease and some cancers.[73] • Australian intakes of harmful saturated fat and salt are higher than the intakes recommended by the Australian Government (National Health and Medical Research Council) and the Heart Foundation.[74 & 75]

Problem	Evidence
Food service There is an increasing trend to eat meals prepared outside the home. Consequently food service is playing an increasingly significant role in the food system. People from areas of lower socioeconomic status are more likely to have a greater reliance on fast food.	• On average Australians eat out more than four times per week (including meals, light meals and snacks), with three **meals** eaten out per week, and more than half of all Australians eating a **meal** out every day.[76] • Over 1.6 billion meals and snacks are eaten out at fast food outlets (including both chain outlets and independent outlets) each year, with almost 1 billion meals and snacks eaten at fast food **chains** each year.[76] • 4.5 million people visit a fast food **outlet** (including both chain outlets and independent outlets) each day, with 1.7 million people visiting a fast food **chain** every day; and 3.2 million people visiting restaurants and cafes every day.[76] • A survey of residents across 19 local government authorities (LGAs) of Melbourne found that twice as many people purchased fast food once a week or more in low socioeconomic areas (14%) compared with high socioeconomic areas (7%).[*] • Tracking of household purchasing patterns of food prepared outside the home (meal occasions, outlet types and type of food purchased) showed a significant increase in the share of meal occasions for hamburgers, pizzas, seafood and sandwiches/rolls from the first quarter of 2008 to the first quarter of 2010.[77]

Social exclusion
 	
There is strong evidence linking social disadvantage to nutrition-related illness, unhealthy eating and food insecurity.
	• Socioeconomic disadvantage has a high influence on cardiovascular disease (CVD). In 2002, CVD death rates of people from the most disadvantaged areas of Australia were between 1.5 and 2.0 times as high as those from least disadvantaged areas.[9]
	• The risk of obesity is 20–40% higher in individuals who are food insecure. This is true for women only and is regardless of income, lifestyle behaviours or education. It is observed consistently across the US, Europe and in Australia.[78]
	• Six per cent of Victorians experience food stress (have run out of food and been unable to afford to buy more in a 12 month period).[79] Furthermore, 53 out of 79 LGAs have reported that one in 20 of their residents ran out of food in the last 12 months and could not afford to buy more.[11]
	• Food insecurity is more prominent in disadvantaged areas and households. A survey across 19 LGAs of Melbourne found:[*]
	  – food insecurity was three times as high for respondents in low socioeconomic areas (12%) compared to high socioeconomic areas (4%)
	  – a reduced ability to lift or carry groceries due to health reasons was more frequent in low socioeconomic areas (26%) compared to both middle (19%) and high socioeconomic areas (13%)
	  – people in low socioeconomic areas were less likely to have access to a car to do their food shopping. About 76% of low socioeconomic residents reported that they always had access to a car to do food shopping – a noticeably lower percentage than those in high socioeconomic areas (about 94%).

*   4,913 residents in 50 small areas across 19 LGAs of Melbourne were surveyed.[13]

Food-sensitive planning and urban design

Problem	Evidence
Social exclusion *Continued…*	• Between 2006 and 2008, the number of emergency relief providers seeking food support from VicRelief Foodbank (Victoria's largest emergency relief resource centre) grew 99% from 312 in 2006, to 620 in 2008.[*] • Victorian emergency relief service providers also identify that they are increasingly assisting people who are not in poverty according to traditional definitions, such as the 'working poor' and people with high levels of debt. These agencies are experiencing growing demand from people "who simply don't earn enough to cover all their basic needs while servicing their debt".[15]
Increasing costs of transport will affect financial pressure and access to food for those in car-dependent areas more than others.	• In Melbourne's fringe suburbs and rural Victoria, petrol was the expense most commonly nominated as contributing to financial hardship for emergency relief recipients, whereas for all other areas emergency relief recipients reported gas or electricity costs as the expense contributing to their financial hardship.[15]
Proximity and density of food retail outlets (e.g. supermarkets, fruit and vegetable stores, convenience stores and fast food outlets) The design and layout of our cities and towns can have a major effect on what foods people can **readily** access. Access to healthy Foods is more difficult when areas have a low range of healthy and affordable Foods available via food retail and food-service outlets.	**Supermarkets and fruit and vegetable stores** • In terms of store proximity (distance from residents' homes to the nearest store), advantaged neighbourhoods in Melbourne have been shown to have a shorter travelling distance to the nearest supermarket or fruit and vegetable store compared with disadvantaged areas.[†] • In terms of store density, advantaged neighbourhoods were shown to have a greater number of supermarkets and fruit and vegetable stores within a 2 km buffer zone from home.[14] • Fruit and vegetable store density (in terms of number of stores per 10,000 residents within neighbourhoods) was found to be greater for advantaged neighbourhoods in Melbourne compared with disadvantaged areas. However, there was no difference in supermarket density (number of stores per 10,000 residents within neighbourhoods) between advantaged and disadvantaged neighbourhoods.[14] **Convenience stores and fast food outlets** • Lower fruit and vegetable intake in Victorian children has been linked with at least one convenience store or fast food outlet within 800 m, and with a greater number of convenience stores and fast food outlets within 800 m.[‡] • A greater number of different fast food chain outlets within 3 km has been shown to be a positive predictor of monthly fast food purchasing in Melbourne.[§] • People in low and mid socioeconomic areas of (19 surveyed) Melbourne LGAs were more likely to be exposed to fast food outlets than high socioeconomic LGAs.[¤] *Continued over…*

[*]   Client types in need of assistance were identified by a survey of 216 agencies (July–October 2008).[80]

[†]   Food store locations, food variety and price within stores were compared across 45 Melbourne neighbourhoods of varying socioeconomic disadvantage.[14]

[‡]   This study was a cross-sectional analysis of 340 children within Melbourne and Geelong recruited from both state and Catholic primary schools.[82]

[§]   This was a multilevel cross-sectional analysis of 2547 individuals from 49 census collector districts in Melbourne, looking at total number and variety of fast food chain outlets (including Red Rooster, McDonald's, KFC, Hungry Jacks and Pizza Hut) within 3 km of respondent's road network distance.[12]

[¤]   4,913 residents in 50 small areas across 19 LGAs of Melbourne were surveyed.[13]

Problem	Evidence
Food deserts (areas characterised by relatively poor access to healthy and affordable food) may contribute to social disparities in diet and diet-related health outcomes such as cardiovascular disease and obesity. Although 'food desert' can mean a literal absence of retail food in a defined area, studies of food deserts more commonly assess differential accessibility to healthy and affordable food between socioeconomically advantaged and disadvantaged areas.[81]	• The City of Maribyrnong's Mapping Maribyrnong program found there were more than 2.5 times the number of takeaway outlets within the municipality than fruit and vegetable outlets, and that 59% of residents were located in 'food deserts', defined in their project as an area 'outside a 500 m radius of a fruit and vegetable outlet'.[83]

Environmental impacts

The environmental impacts of our food system are less immediately evident to urban households than direct electricity and water use, but they are substantially greater.

• Approximately 50% of household water used is contained in the food its inhabitants consume, compared to 11% directly used in the house and garden.[16]
• Approximately 28% of household greenhouse gas emissions are from food – compared to 20% in direct energy use, and 10% for transport.[17]
• Over 40% of household residual rubbish sent to landfill in Melbourne is food organics.*

Figure 10. Contributions to ecological footprint in Households (UK)
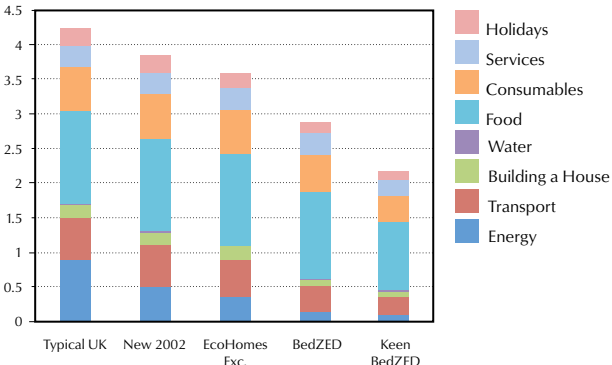
Best-practice sustainable (even 'zero-carbon') settlements in the UK have enabled substantial reductions in the ecological footprint of inhabitants. The largest, and so far hardly affected, portion of the footprint is from food.[84]
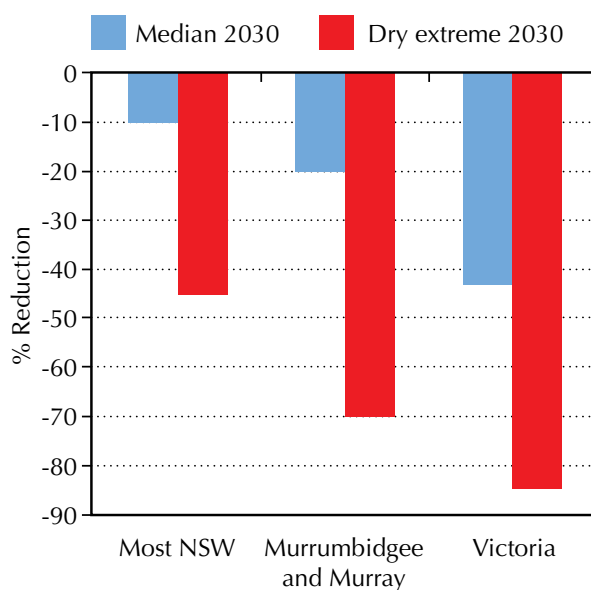
---

* Derived from audits of household residual (rubbish) bins conducted by a number of Melbourne councils between 2006 and 2008. Industrial food waste contributes 21% of the waste to landfill in Victoria (852,000 tonnes in 2006-07). Avoiding, recovering and reprocessing this material (rather than landfilling) provides a significant greenhouse gas reduction benefit, in the order of 300-500 kg of CO2-equivalent per tonne of organics recovered.[18]

Appendix 2. Emerging issues

This section outlines some emerging challenges that are beginning to impact on our food system, and that contribute to the case for urgent consideration of how our urban and peri-urban areas contribute to a healthy and resilient food system.

Problem	Evidence
Climate change Australia's climate is changing due to greenhouse gases already in the atmosphere, and projected impacts up to 2030 are considered unavoidable. [19] Food production is already being affected by climate change, particularly drought and extreme weather events. Global greenhouse gas emissions are increasing at a rate higher than the worst-case (no action) scenario projected by the International Panel on Climate Change (IPCC) in 2000. This is likely to mean that the projected impacts of climate change are conservative. [20]	• Climate change will bring localised advantages and disadvantages for food production, but worldwide and local declines in productivity are expected. [21] • In 2007–2008, 84% of Australian farmers reported having experienced adverse seasonal conditions. A third of these reported utilising financial reserves and/or increasing business liabilities as a response. [22] • An example of the impacts of extreme weather events is the horticultural losses from the 2009 heatwave in the Port Phillip region: 50–90% of raspberry, blackberry and blueberry crops; 20–25% in orchard crops (apples and late-season apricots); 60–80% of the strawberry crop that would have been picked during March. [23] **Figure 11.** Projected water available for irrigation in the Southern Murray Darling Basin [85] Key irrigation systems are unlikely to continue supporting previous levels of production.

Problem	Evidence
Vulnerability to peak oil The cost and availability of fossil fuels are critical to the food system, through their direct use on farms, tight links to the manufacture of fertilisers and agricultural chemicals, and their use in food distribution – including both supply chains and consumer access.	Concern about the imminent gap between demand for oil and the ability to increase supply – and the economic impacts of this gap – is increasing rapidly around the world. • 'Sustained investment is needed mainly to combat the decline in output at existing oil fields, which will drop by almost two thirds by 2030.'[86] • Remaining oil reserves are increasingly difficult and expensive to extract and use, requiring much more energy to be used for each barrel of oil returned. • Australian primary oil production (crude oil, condensate and LPG) peaked in 2000–2001 and declined at an average rate of 5% per year to 2007–2008. Australia's net imports of oil and oil products represented 45% of consumption in 2007–2008.[87 & 88] • Fuel costs account for a significant proportion of agricultural income in Australia: 32.4% (cropping), 21.1% (beef) and 15.4% (dairy), but less than 1% of costs for most other industries.[89] • Oil is a major cost in food distribution, including how people access their food (if they are car dependent). Outer suburban, regional and rural communities will feel the impacts sharply.
Vulnerability to depletion of other resources Food production is heavily dependent on a range of agrochemicals that are vulnerable to resource depletion.	• Nitrogen fertilisers are derived from natural gas – a non-renewable source that is closely linked to the oil price. • Phosphate fertilisers are derived from phosphate rock, which is also expected to peak in coming years. • Escalating costs and an inability to secure supplies of fertiliser have already impacted on Australia's agriculture sector.
Loss of land Our ability to produce food is being eroded by a range of factors and is dependent on resources that are increasingly contested and expensive – including land and soil.	• During the past 40 years, nearly one-third of the world's cropland (1.5 billion hectares) has been abandoned because of soil erosion and degradation.[90] • It takes approximately 500 years for natural processes to replace 25 mm (1 in) of topsoil lost to erosion.[91] Increasing use of regenerative agricultural practices is helping to rebuild topsoil, but this can only occur where sufficient land and water are both available. • Since 1945, Australian cities have expanded over more than one million hectares of rural land.[25] • The displacement of food production from fertile peri-urban land to more marginal land increases reliance on fertilisers[26] and transport. • The size of new houses in Australia is increasing (from 200 m^2 in 1950, to 250 m^2 in 1990 and 325 m^2 in 2005), while new block sizes are decreasing (from 900 m^2 in 1950 – just under a quarter of an acre – to 600 m^2 in 1990, and 400 m^2 by 2005 – less than one-tenth of an acre).[92] There is less outside space within residential areas.

Food-sensitive planning and urban design

Problem	Evidence

Population growth
 	
An increasing population requires more resources to house, feed and employ – unless we are able to change the intensity of our resource use per person.
	• The Australian population is expected to rise to between 33.7 and 62.2 million by 2101.[93]
	• While an increasing population does affect land and resource use, it is important to also consider Australia's relative consumption levels.
	  – Two-thirds of all the people on Earth use less than 60 L of water a day; the average Australian uses more than twice that amount during a single shower. In fact, Australians are among the biggest users of water in the world, especially around the home.[94]
	  – As outlined above, the size of new houses is increasing in Australia, yet household size (number of people) is decreasing.

Wasted resources Our cities and towns concentrate the critical resources needed to provide food (particularly water, nutrients and labour). Currently these resources are often not recognised, or are even treated as wastes or problems. Integrating food production into urban systems can 'close the loop' of resource flows in and out of cities, making use of the resources we have available.	• There are abundant resources in urban areas that can contribute to sustainable and resilient Food production. • Rainwater could substitute over 85% of the mains water requirement of the City of Melbourne (in 2000).[95] • In the greater Melbourne area, 400 GL of water runs off roofs and roads even in a dry year. This water **damages** urban waterways when it rushes through them during peak events.[*] • Over 80% of the phosphorus and nitrogen in household waste loads could be beneficially used on farmland.[27] Where urine-separating toilets are installed in Sweden, it has been found that the fertilising effect of urine on cereals is close to that for chemical nitrogen fertiliser (90%), and the phosphorus is equal to that for chemical fertiliser.[28] • Crops grown in soils treated with increasing rates of biosolids can produce equivalent or better yields than conventional fertiliser.[29] • Organic waste processing can also provide renewable energy. • The energy costs of pumping water and transporting bulky organic material mean that these materials may be most viable for production where they are concentrated – e.g. within and near to urban areas.

* The ecological ideal would be for 50 GL to soak into the ground (to slowly recharge waterways) and 350 GL of it to be captured and used for irrigation and to replace mains water.[96]

Appendix 3. The challenges for FSPUD

Some of the many challenges in reconciling Food objectives with other planning objectives are outlined in the table below. This list is not intended to be exhaustive, but to show the breadth of issues that are in planning and urban design's sphere of interest, if not entirely in its control.

Table 3. FSPUD challenges matrix

	Health and fairness	Sustainability and resilience
Producing Food	→ Do Food producers have fair and secure access to land, resources, markets, etc? → Could people produce their own Food if they want/need to? → Is local Food production safe and hygienic?	→ Can we reduce the environmental footprint of Food? → Can we reduce dependence on fossil fuels used for fuel and agrochemicals? → Can we use wasted resources in urban environments to produce Food? → Can we increase the diversity of food sources and production systems?
Processing and transporting Food	→ Can we facilitate food processors to produce healthy and affordable Foods? → Do supply chains support the delivery of safe and nutritious Foods? → Are healthy and low-impact Foods readily accessible in all areas? → Is local Food processing safe and hygienic?	→ Do Food processors have access to sustainable energy, water and material inputs? Are there barriers to access and use of these resources? → Are Food businesses appropriately located and co-located for ready access to raw Food product? → Can we reduce requirements for packaging, transport and storage? → What is needed to enable efficient and sustainable Food distribution? → Can we make more sustainable forms of transport (e.g. haulage by train) more attractive than alternatives (e.g. road haulage)?
Consumer access and utilisation	→ Can people easily access Food, irrespective of the modes of transport available to them? → Are there appropriate incentives to choose Food? → Do people have access to a diverse range of Food outlets, e.g. markets, supermarkets, small retailers, Food service (eating out)? → Are points of access and shopping experiences welcoming and inclusive? → Could extreme weather events impact on food safety? → Are there appropriate places for breast-feeding?	→ Can people access Food if they don't have access to a car? → Is sustainable Food available, with clear information to enable choice? → Does Food come from diverse sources? → Are Food outlets co-located with other destinations, to enable multipurpose trips? → How might Food access be affected by extreme weather events?
Waste, recycling and re-use management	→ Does Food waste pollute its surroundings? → Are products from recycled organic wastes safe for re-use? → Is all packaging safe?	→ Do people have appropriate storage facilities? → Are there facilities to recycle Food and other organic waste? → Do people and businesses have access to, and skills for, waste management? → Is the use of packaging minimised, and are resources used for packaging recyclable or reusable?

Livelihoods and opportunity	Amenity and community
→ Can producers confidently invest in their properties and infrastructure? → Can people commercially produce and market Food from urban areas? → Can urban areas contribute to the viability of farming in their hinterland through market opportunities and resources?	→ Can Food production contribute to urban amenity? → Can Food production improve the environments of those living nearby? → Can Food producers co-exist with urban areas – what needs to change to resolve conflict?
→ Are there barriers to Food businesses being established where employment is needed? → Are there opportunities for skills development?	→ Do Food processing and distribution facilities impact on the amenity of surrounding residents?
→ Are there opportunities for rewarding employment in Food retail and exchange? → Are there opportunities for businesses to offer Food service and distribution services?	→ Do Food outlets also meet other social needs? → Do people have the skills and facilities required to prepare Food? → Are places where Food is produced, processed or distributed designed to reflect the importance of Food to the community? → Do they add prestige to good Food and imply that Food is valued here? → Can communities store, prepare, cook and celebrate Food together? → Are water fountains available in public spaces?
→ Are organic waste treatment facilities located to maximise viability of products – i.e. near Food producers? → Are there opportunities for diverse water and nutrient recycling businesses?	→ Does waste management infrastructure reduce the amenity of surrounding communities? → Are space and resources available for community waste management and composting?

Notes
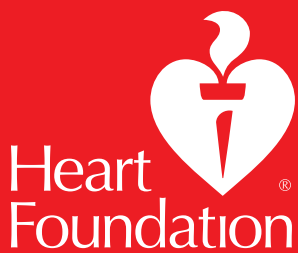
Heart Foundation

For heart health information
1300 36 27 87
www.heartfoundation.org.au

Australian Capital Territory

Canberra

15 Denison Street
Deakin ACT 2600

Tel: (02) 6282 5744

New South Wales

Sydney

Level 3, 80 William Street
Sydney NSW 2011

Tel: (02) 9219 2444

Newcastle

Suite 5, OTP House
Bradford Close
Kotara NSW 2289

Tel: (02) 4952 4699

Illawarra

Kiama Hospital and
Community Health Service
Bonaira Street
Kiama NSW 2533

Tel: (02) 4232 0130

Northern Territory

Darwin

Darwin Central Offices
Level 3, 21 Knuckey Street
Darwin NT 0800

Tel: (08) 8981 1966

Alice Springs

Shop 1, 9 Parsons Street
Alice Springs NT 0870

Tel: (08) 8953 5942

Queensland

Brisbane

557 Gregory Terrace
Fortitude Valley QLD 4006

Tel: (07) 3872 2500

Townsville

Suite 7B, 95 Denham Street
Townsville QLD 4810

Tel: (07) 4721 4686

South Australia

Adelaide

155-159 Hutt Street
Adelaide SA 5000

Tel: (08) 8224 2888

Tasmania

Hobart

86 Hampden Road
Battery Point TAS 7004

Tel: (03) 6224 2722

Northern Tasmania

Kings Meadows
Community Health Centre,
McHugh St
Kings Meadows TAS 7249

Tel: (03) 6336 5116

North-West Tasmania

2nd Floor, Room 232
Community & Health
Services Centre
23 Steele Street
Devonport TAS 7310

Tel: (03) 6421 7704

Victoria

Melbourne

Level 12, 500 Collins Street
Melbourne VIC 3000

Tel: (03) 9329 8511

Western Australia

Perth

334 Rokeby Road
Subiaco WA 6008

Tel: (08) 9388 3343