Discussion Paper Submission

Introduction

Please find following key information about making a submission.

Who can make a submission?

Anyone is able to comment and make submissions on the Plan Melbourne refresh discussion paper.

How will submissions be used?

We want a Plan Melbourne to reflect the community’s views, particularly in relation to housing affordability and diversity, energy efficiency and climate change. All submissions received will be reviewed and inform Plan Melbourne 2016.

Will submissions be publicly available?

Written submissions will be publicly available and will be able to be read by others, unless you have requested and been granted confidentiality status.

Why do I have to register to make a submission or comment online?

The information provided in the registration form will help us analyse the responses and help us know which issues are of concern to residents in which areas of Melbourne or to particular community groups.

Can I provide a submission in another format?

Given the high volume of submissions anticipated it is strongly preferred that the online form or the downloadable template be used. This will ensure the most effective evaluation of the issues raised in submissions.

How do I make a submission?

You will need to register to make a submission. Submissions and comments will close at 5.00pm AEDST Friday 18 December 2015. Once registered, there are two ways to make a submission:

- Complete the online submission form
- Upload your submission using this submission template. Note that the preferred format is MS Word.

As part of making a submission, you will need to agree to the privacy collection notice and statement of confidentiality. These are outlined in both the online submission and upload forms.

Do I have to respond to all of the questions in the submission form for my views to be heard?

Not at all. You are welcome to respond to as many, or as few, of the questions on the Plan Melbourne refresh discussion paper as you would like.
Can I comment on other areas not addressed in the Plan Melbourne refresh discussion Paper?

This refresh is not intended to comprehensively revise Plan Melbourne 2014. It builds on the extensive work and consultation underpinning Plan Melbourne 2014. Much of Plan Melbourne 2014 enjoys bi-partisan support and will not change.

The Plan Melbourne refresh discussion paper and consultation process is asking Melburnians to take another look at particular aspects of Plan Melbourne 2014 that need revision such as the key issues of housing supply, diversity and affordability, and climate change and will reflect the Government’s transport network priorities.
Chapter 2: Growth, challenges, fundamental principles and key concepts

1. The discussion paper includes the option (option 5, page 16) that Plan Melbourne better define the key opportunities and challenges for developing Melbourne and outlines some key points for considerations in Box 1. Are there any other opportunities or challenges that we should be aware of?

This response from the Victorian Eco-Innovation Laboratory at the University of Melbourne focuses specifically on the challenge of planning for the food supply of Melbourne’s rapidly growing population. It draws on emerging findings from the Foodprint Melbourne project. Further details and references can be found in the publications from this project, which include ‘Melbourne’s foodbowl: Now and at 7 million’ and ‘The role of cities in climate resilient food systems: A Foodprint Melbourne briefing’. These have been provided as attachments.

The findings of the Foodprint Melbourne project indicate that as Melbourne grows to a population of 7 million, 60% more food will be required to feed the city’s population. However, loss of farmland due to urban sprawl could reduce the capacity of Melbourne’s foodbowl to produce fresh food. Melbourne’s foodbowl currently produces enough food to meet around 41% of the population’s needs, including around 82% of the city’s demand for fresh vegetables. By 2050, the city’s foodbowl may only be able to meet 18% of the city’s food needs and just 21% of the demand for fresh vegetables.

The supply of fresh vegetables is likely to be particularly affected by urban sprawl, because Melbourne’s foodbowl produces 47% of the vegetables grown in the state of Victoria and because fresh vegetables tend to grow in the inner foodbowl, where they are at risk from expansion of the Urban Growth Boundary. Vegetable production also requires fertile soils and a secure source of water, which are in relatively short supply in Victoria. However, like many world cities, Melbourne was founded in an area with relatively fertile soils and it has secure sources of recycled water from the city’s water treatment plants and desalination plant. If Melbourne is able to accommodate its predicted population growth in a way that retains the productive capacity of agricultural land on the city fringe, Melbourne’s foodbowl could play an important role in strengthening the resilience of the city’s supply of fresh food.

The challenge of accommodating population growth while retaining the productive capacity of the city’s foodbowl should be identified in Plan Melbourne. To enable an appropriate response to this challenge, planning for the city’s future food supply should be recognized as an integral part of metropolitan planning, alongside planning for key infrastructure such as transport and housing. Pressures on national and global food supplies are increasing, due to population growth, changes in dietary patterns, climate change and declining supplies of natural resources, such as fertile land and water. Cities around the world are therefore increasingly focusing in metropolitan planning on strengthening the resilience and sustainability of their food supplies through food system planning. There is a strong argument for Melbourne to do the same. Melbourne is located in a water scarce region that has limited availability of fertile soils and where fresh food supplies are at risk due to urban sprawl. The city’s foodbowl should be recognized in Plan Melbourne as a valuable strategic asset, and a firm commitment should be given to protecting this asset.
2. The discussion paper includes the option (option 6, page 18) that the United Nations Sustainable Development Goals be included in Plan Melbourne 2016. **Do you agree with this idea? If so, how should the goals be incorporated into Plan Melbourne 2016? Choose one option:**

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [x] Strongly Agree

*Please explain your response:*

3. The discussion paper includes the option (option 7, page 18) to lock down the existing urban growth boundary and modify the action (i.e. the action under Initiative 6.1.1.1 in Plan Melbourne 2014) to reflect this. **Do you agree that there should be a permanent urban growth boundary based on the existing boundary? Choose one option:**

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [x] Strongly Agree

*Please explain your response:*

A permanent Urban Growth Boundary (UGB) is essential to protect Melbourne’s foodbowl. However, it is unclear how the mechanism to deliver a permanent or ‘locked down’ boundary will differ from the existing mechanism, which was also intended to deliver a permanent boundary, but has been revised four times since it was introduced. With each expansion of the UGB, more highly productive farmland is lost. Each review of the UGB also communicates to stakeholders that the city boundary is a ‘soft’ rather than ‘hard’ edge and that it is malleable. This fuels a cycle of speculative investment in ‘landbanking’ farmland. The UGB can only function as a genuine ‘hard edge’ to the city if reviews of the UGB cease.

Greater recognition is also needed of what is lost through expansions of the UGB. The significance of farmland in the city’s foodbowl is under-recognised in terms of its capacity for food production, its contribution to the supply of fresh foods and its contribution to the state’s economy. Melbourne’s foodbowl consists of many relatively small areas of food production scattered around the city fringe. Expansions of the UGB into any one of these smaller areas of food production tend to be seen as insignificant in terms of their impact on the economy or the food supply. However, the loss in productive capacity of the city’s foodbowl occurs through the cumulative impact of these multiple expansions of the UGB in various foodbowl regions. Plan Melbourne should provide a clear statement about why Melbourne’s UGB is now ‘locked down’, which should include recognition of the significance of the city’s foodbowl and the cumulative impact of UGB expansions on its productive capacity.

Agricultural land on the city fringe should also receive stronger long-term protection to prevent future re-zoning for development and inclusion in the UGB. Fertile land on the city fringe should be protected as a strategic asset for the food security of current and future generations, so that local sources of food production can continue to contribute to meeting the city’s food needs.
4. The discussion paper includes the option (option 8, page 18) that Plan Melbourne 2016 should more clearly articulate the values of green wedge and peri-urban areas to be protected and safeguarded. How can Plan Melbourne 2016 better articulate the values of green wedge and peri-urban areas?

Plan Melbourne should better articulate the significance of green wedge and peri-urban areas for food production, both in terms of the economic contribution of food production in these areas and their contribution to a sustainable and resilient food supply. This is important because there is low awareness of the value of these areas for food production, and this low awareness impedes attempts to protect the productive capacity of green wedge and peri-urban areas.

The green wedges comprise a significant part of Melbourne’s foodbowl. The ‘inner foodbowl’ region identified by the Foodprint Melbourne project is made up to a large extent of the green wedges. This inner foodbowl region is an important source of highly perishable foods like fresh vegetables and berries, which benefit from close proximity to population centres and markets. The inner foodbowl region is a highly productive agricultural area that represents just 2% of Victoria’s agricultural land, but produces a high proportion of some fruits and vegetables, including 96% of the state’s berries, 94% of asparagus, 92% of cauliflowers, 66% of broccoli and 62% of lettuce. The inner foodbowl also produces 35% of Victoria’s eggs and 59% of chicken meat.

The Plan Melbourne Refresh discussion paper highlights the value of green wedge and peri-urban areas for agricultural industries. This is important, and the economic value of agriculture in Melbourne’s foodbowl (and secondary industries) will form a key focus of future stages of the Foodprint Melbourne project. However, the value of food producing areas in the green wedges and peri-urban areas should be articulated more broadly in Plan Melbourne to encompass their value for the resilience and sustainability of the city’s food supply, as well as the population’s food security.

5. The discussion paper includes the option (option 9, page 18) to remove the concept of an Integrated Economic Triangle and replace it with a high-level 2050 concept map for Melbourne (i.e. a map that shows the Expanded Central City, National Employment Clusters, Metropolitan Activity Centres, State-Significant Industrial Precincts, Transport Gateways, Health and Education Precincts and Urban Renewal Precincts). What elements should be included in a 2050 concept map for Melbourne?

6. The discussion paper includes the option (option 10, page 18) that the concept of Melbourne as a polycentric city (i.e. a city with many centres) with 20-minute neighbourhoods (i.e. the ability to meet your everyday (non-work) needs locally, primarily within a 20-minute walk) be better defined. Do the definitions adequately clarify the concepts? Choose one option:

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

Please explain your response:
7. The discussion paper includes options (options 11-17, pages 23 to 27) that identify housing, climate change, people place and identity and partnerships with local government as key concepts that need to be incorporated into Plan Melbourne 2016. Do you support the inclusion of these as key concepts in Plan Melbourne 2016?

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

Please explain your response:

8. Any other comments about chapter 2 (growth, challenges, fundamental principles and key concepts)?

Chapter 3: Delivering jobs and investment

9. The discussion paper includes the option (option 20, page 30) to revise the Delivering Jobs and Investment chapter in Plan Melbourne 2014 to ensure the significance and roles of the National Employment Clusters as places of innovation and knowledge-based employment are clear. How can Plan Melbourne 2016 better articulate the significance and roles of the National Employment Clusters as places of innovation and knowledge-based employment?

10. The discussion paper includes two options (page 30) relating to National Employment Clusters, being:

Option 21A: Focus planning for National Employment Clusters on core institutions and businesses

Option 21B: Take a broader approach to planning for National Employment Clusters that looks beyond the core institutions and businesses

Which option do you prefer?

- [ ] Option 21A
- [ ] Option 21B

Please explain why you have chosen your preferred option:
11. The discussion paper includes the option (option 22, page 30) to broaden the East Werribee National Employment Cluster to call it the Werribee National Employment Cluster in order to encompass the full range of activities and employment activities that make up Werribee. This could include the Werribee Activity Centre and the Werribee Park Tourism Precinct. *Do you agree with broadening the East Werribee Cluster? Choose one option:*

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

*Why?*

12. The discussion paper includes the option (option 23, page 30) to broaden the Dandenong South National Employment Cluster to call it the Dandenong National Employment Cluster in order to encompass the full range of activities and employment activities that make up Dandenong. This could include the Dandenong Metropolitan Activity Centre and Chisholm Institute of TAFE. *Do you agree with broadening the Dandenong South National Employment Cluster? Choose one option:*

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

*Why?*

13. The discussion paper includes options (options 24 to 30, pages 33 and 34) that consider the designation of activity centres and criteria for new activity centres. *Do you have any comments on the designation of activity centres or the criteria for new activity centres as outlined in the discussion paper?*

14. The discussion paper includes the option (option 31, page 35) to evaluate the range of planning mechanisms available to protect strategic agricultural land. *What types of agricultural land and agricultural activities need to be protected and how could the planning system better protect them?*

It is important that all remaining areas of agricultural land on Melbourne’s fringe are identified and protected, including areas currently within the UGB. The Foodprint Melbourne project highlights that 60% more food will be required to feed a population of 7 million. However, up to 16% of farmland in
Melbourne’s foodbowl could be lost to urban sprawl as the city expands to accommodate this population if existing rates of urban density are maintained. This loss of farmland could reduce the foodbowl’s capacity to meet the food needs of the city’s growing population from 41% to around 18% by 2050. If the types of agricultural land to be protected are defined too narrowly, this could result in significant loss of production capacity. It is also important that the areas of agricultural land to be protected are defined broadly. Plan Melbourne 2014 identified the need for localised planning statements for the Mornington Peninsula, Yarra Ranges and Macedon Ranges to acknowledge areas important for food production. However, Melbourne’s foodbowl contains many important areas of food production that are scattered around the city, some of which are small but significant areas, such as Werribee Irrigation District, which produces around 10% of Victoria’s vegetables, including 85% of cauliflower and 53% of broccoli. The significance of these many smaller areas of food production should also be acknowledged.

The significance of remaining areas of agricultural land in close proximity to the city, such as the Heatherton and Clayton market gardens and the Werribee Irrigation District, should also be recognised. These areas benefit from close proximity to population centres, markets and labour and are well suited to intensive production of highly perishable fresh vegetables. As some of Melbourne’s last remaining areas of traditional market gardens, they also have heritage value and the potential to be developed as areas that enable consumers to reconnect with food producers e.g. through community supported agriculture and farmgate sales.

Some of the most strategically significant areas of agricultural land in Melbourne’s foodbowl are the areas with existing or potential access to secure sources of recycled water. This includes the areas in close proximity to the Eastern and Western Treatment Plants, and the proposed Bunyip Food Belt. These areas, where highly fertile land co-exists with secure sources of water, should be recognized for their potential to be developed as future ‘drought proof’ foodbowls and given the highest possible levels of protection. An audit should be undertaken to identify additional areas of Melbourne’s foodbowl that have access to secure sources of recycled water, and investigations undertaken of the potential to promote food production in these areas by investing in infrastructure to increase the amount of recycled water available for food production.

A number of potential mechanisms for protecting agricultural land are identified in Plan Melbourne and these mechanisms are currently under investigation. It is important that measures are integrated into both state and local planning policy frameworks. Melbourne’s foodbowl is of state, as well as local, significance and strong measures to protect the city’s foodbowl should be adopted in Plan Melbourne and the State Planning Policy Framework. It is also important that mechanisms to protect agricultural land are closely linked to additional measures that promote active farming of the land, with an emphasis on food production. This will require an integrated ‘whole of government’ approach to protection of agricultural land that recognizes the need for action by other areas and levels of government e.g. to encourage young farmers to take up farming in Melbourne’s foodbowl, invest in appropriate infrastructure or grow the market for food produced in the city’s foodbowl.

15. The discussion paper includes the option (option 32, page 36) to implement the outcomes of the Extractive Industries Taskforce through the planning scheme, including Regional Growth Plans, to affirm that extractive industries resources are protected to provide an economic supply of materials for construction and road industries. Do you have any comments in relation to extractive industries?
16. Any other comments about chapter 3 (delivering jobs and investment)?
Chapter 4: A more connected Melbourne

17. The discussion paper includes the option (option 34, page 42) to include the Principal Public Transport Network in Plan Melbourne 2016. Do you agree that the Principal Public Transport Network should inform land use choices and decisions? Choose one option:

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

Why?

18. The discussion paper includes the option (option 35, page 43) to incorporate references to Active Transport Victoria (which aims to increase participation and safety among cyclists and pedestrians) in Plan Melbourne 2016. How should walking and cycling networks influence and integrate with land use?

19. Any other comments about chapter 4 (a more connected Melbourne)?
Chapter 5: Housing

20. The discussion paper includes the option (option 36A, page 46) to establish a 70/30 target where established areas provide 70 per cent of Melbourne’s new housing supply and greenfield growth areas provide 30 per cent. Do you agree with establishing a 70/30 target for housing supply? Choose one option:

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

Why?

21. What, if any, planning reforms are necessary to achieve a 70/30 target?

Why?

22. The discussion paper includes the option (option 36B, page 46) to investigate a mechanism to manage the sequence and density of the remaining Precinct Structure Plans based on land supply needs. Do you agree with this idea? Choose one option:

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

Why?

23. The discussion paper includes the option (option 36C, page 46) to focus metropolitan planning on unlocking housing supply in established areas, particularly within areas specifically targeted for growth and intensification. Do you agree with this idea? Choose one option:

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

Why?
24. The discussion paper includes options (option 37, page 50) to better define and communicate Melbourne’s housing needs by either:

Option 37A: Setting housing targets for metropolitan Melbourne and each sub-region relating to housing diversity, supply and affordability.

Option 37B: Developing a metropolitan Housing Strategy that includes a Housing Plan.

*Which option do you prefer? Choose one option:*

☐ Option 37A
☐ Option 37B
☐ Other

*Why?*

________________________________________________________________________

25. The discussion paper includes the option (option 38, page 52) to introduce a policy statement in Plan Melbourne 2016 to support population and housing growth in defined locations and acknowledge that some areas within defined locations will require planning protection based on their valued character. *How could Plan Melbourne 2016 clarify those locations in which higher scales of change are supported?*

________________________________________________________________________

26. The discussion paper includes the option (option 39, page 52) to clarify the direction to ‘protect the suburbs’. *How could Plan Melbourne 2016 clarify the direction to protect Melbourne and its suburbs from inappropriate development?*

________________________________________________________________________

27. The discussion paper includes the option (option 40, page 56) to clarify the action to apply the Neighbourhood Residential Zone to at least 50 per cent of residential land by:

Option 40A: Deleting the action and replacing it with a direction that clarifies how the residential zones should be applied to respect valued character and deliver housing diversity.

Option 40B: Retain at least 50 per cent as a guide but expand the criteria to enable variations between municipalities.

*Which option do you prefer? Choose one option:*

☐ Option 40A
☐ Option 40B
☐ Other

*Why?*
28. The discussion paper includes the option (option 42, page 58) to include an action in Plan Melbourne 2016 to investigate how the building and planning system can facilitate housing that readily adapts to the changing needs of households over the life of a dwelling. *In what other ways can Plan Melbourne 2016 support greater housing diversity?*

29. A number of options are outlined in the discussion paper (page 58) to improve housing affordability, including:

   - **Option 45A:** Consider introducing planning tools that mandate or facilitate or provide incentives to increase social and affordable housing supply.

   - **Option 45B:** Evaluate the affordable housing initiative pilot for land sold by government to determine whether to extend this to other suitable land sold by government.

   - **Option 45C:** Identify planning scheme requirements that could be waived or reduced without compromising the amenity of social and affordable housing or neighbouring properties.

   *What other ideas do you have for how Plan Melbourne 2016 can improve housing affordability?*

30. Any other comments about chapter 5 (housing)?
Chapter 6: A more resilient and environmentally sustainable Melbourne

31. The discussion paper includes the option (option 46, page 69) to introduce Strategic Environmental Principles in Plan Melbourne 2016 to guide implementation of environment, climate change and water initiatives. Do you agree with the inclusion of Strategic Environmental Principles in Plan Melbourne 2016? Choose one option:

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

Why?

32. The discussion paper includes the option (option 47, page 72) to review policy and hazard management planning tools (such as overlays) to ensure the planning system responds to climate change challenges. Do you agree with this idea? Choose one option:

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

Why?

33. The discussion paper includes options (options 48 and 49, page 72) to update hazard mapping to promote resilience and avoid unacceptable risk, and update periodically the planning system and supporting legislative and policy frameworks to reflect best available climate change science and data. Do you have any comments on these options?

Why?

34. The discussion paper includes the option (option 50, page 73) to incorporate natural hazard management criteria into Victorian planning schemes to improve planning in areas exposed to climate change and environmental risks. Do you agree with this idea? Choose one option:

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

Why?
35. The discussion paper includes the option (option 51, page 75) to investigate consideration of climate change risks in infrastructure planning in the land use planning system, including consideration of an ‘infrastructure resilience test’. Do you agree that a more structured approach to consideration of climate change risks in infrastructure planning has merit? Choose one option:

[ ] Strongly Disagree  
[ ] Disagree  
[ ] Agree  
[ ] Strongly Agree

Why?

The proposed investigation of climate change risks in infrastructure planning should include consideration of the risks of climate change for Melbourne’s food supply, and the role that Melbourne’s foodbowl could play in increasing the resilience of the city’s food system to climate change. This is documented in a briefing from the Foodprint Melbourne project on ‘The role of cities in climate resilient food systems’.

Climate change is likely to reduce the capacity for food production across Southern Australia through drying and warming, and increased frequency of extreme weather events, such as droughts, storms and floods. This could lead to disruptions in food supply and spikes in the price of fresh foods, as seen in Australia during the Millenium Drought and the 2010-11 Brisbane Floods. Melbourne’s foodbowl could play an important role in increasing the resilience of the city’s food supply to these disruptions, and this should be investigated, with a particular emphasis on the role of areas with existing or potential access to recycled water and their potential to be developed as ‘drought proof’ areas of food production.

36. The discussion paper includes the option (option 52, page 76) to strengthen high-priority habitat corridors throughout Melbourne and its peri-urban areas to improve long-term health of key flora and fauna habitat. Do you agree with this idea? Choose one option:

[ ] Strongly Disagree  
[ ] Disagree  
[ ] Agree  
[ ] Strongly Agree

Why?

37. The discussion paper includes options (options 53 and 54, pages 78 and 79) to introduce strategies to cool our city including: increasing tree canopy, vegetated ground cover and permeable surfaces; use of Water Sensitive Urban Design and irrigation; and encouraging the uptake of green roofs, facades and walls, as appropriate materials used for pavements and buildings with low heat-absorption properties. What other strategies could be beneficial for cooling our built environment?
38. The discussion paper includes the option (option 56A, page 80) to investigate opportunities in the land use planning system, such as strong supporting planning policy, to facilitate the increased uptake of renewable and low-emission energy in Melbourne and its peri-urban areas. Do you agree that stronger land use planning policies are needed to facilitate the uptake of renewable and low-emission energy? Choose one option:

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

Why?

39. The discussion paper includes options (options 56B and 56C, page 80) to strengthen the structure planning process to facilitate future renewable and low-emission energy generation technologies in greenfield and urban renewal precincts and require consideration of the costs and benefits of renewable or low-emission energy options across a precinct. Do you agree that the structure planning process should facilitate the uptake of renewable and low-emission technologies in greenfield and urban renewal precincts? Choose one option:

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

Why?

40. The discussion paper includes the option (option 57, page 81) to take an integrated approach to planning and building to strengthen Environmentally Sustainable Design, including consideration of costs and benefits. Do you agree that an integrated planning and building approach would strengthen Environmentally Sustainable Design? Choose one option:

- [ ] Strongly Disagree
- [ ] Disagree
- [ ] Agree
- [ ] Strongly Agree

Why?

41. Any other comments about chapter 6 (a more resilient and environmentally sustainable Melbourne)?
Chapter 7: New planning tools

42. The discussion paper includes options (options 58A and 58B, page 84) to evaluate whether new or existing planning tools (zones and overlays) could be applied to National Employment Clusters and urban renewal areas. *Do you have any comments on the planning tools (zones and overlays) needed for National Employment Clusters and urban renewal areas?*

43. The discussion paper includes options (options 59A and 59B, page 84) to evaluate the merits of code assessment for multi-unit development, taking into account the findings from the ‘Better Apartments’ process, to either replace ResCode with a codified process for multi-unit development or identify ResCode standards that can be codified. *Do you have any comments on the merits of code assessment for multi-unit development?*

44. Any other comments about chapter 7 (new planning tools)?
Chapter 8: Implementation

45. The discussion paper includes the option (options 1 and 61, pages 14 and 90) of Plan Melbourne being an enduring strategy with a long-term focus supported by a ‘rolling’ implementation plan. *Do you agree that separating the long-term strategy from a shorter-term supporting implementation plan is a good idea?*

46. *If a separate implementation plan is developed for Plan Melbourne 2016 what will make it effective?*

47. *Any other comments about chapter 8 (implementation)?*
Introduction

Melbourne, Australia’s second largest city, is situated in a region already feeling the impacts of climate change, including increasing temperatures and decreasing water availability. Like many world cities, Melbourne has historically produced a significant amount of fresh food on its urban fringe. This peri-urban food production has the potential to contribute to a more resilient and sustainable food supply for Melbourne in the context of rapid population growth and increasing climate pressures, but food production on Melbourne’s fringe is under threat from urban development.

Sustainable and resilient city region food systems

There is increasing international policy attention on the role of cities in contributing to more sustainable and resilient food systems, particularly in the context of climate change adaptation. Recent policy initiatives and declarations such as the 2014 Medellin Call for Action, the 2015 Seoul Declaration and the Milan Urban Food Policy Pact have all highlighted an important role for city region food systems in increasing the sustainability and resilience of food systems.

One of the things emphasised by these policy initiatives is the importance of urban and peri-urban food production in increasing the resilience of food systems; that is, increasing the capacity of food systems to withstand and recover from the effects of crises or shocks, such as natural disasters (e.g. droughts, storms and floods) or socio-economic shocks, such as a rapid rise in food prices.

For a city such as Melbourne, which is geographically isolated and faces climate threats such as drought, bushfires, storms and floods, urban and peri-urban food production has the potential to increase food system resilience in multiple ways. This includes reducing the dependence of the city population on distant sources of food and maximising the use of the limited natural resources available for food production, particularly fertile soils and water. South-East Australia is a water-scarce region, and less than 10% of its soils are arable and suitable for agricultural production. Some of the best soils and most secure sources of water are located on the coastal fringe around its major cities.

Melbourne is not unusual in having access to fertile soils and reliable water sources close to the city. Many world cities were founded in fertile areas with good access to water to provide a secure source of fresh food for their growing populations. Some world cities still produce significant amounts of fresh food on their peri-urban fringes, particularly vegetables, but also fresh milk, eggs, poultry, pork and fruit. Shanghai produces enough...
vegetables to meet around 60% of the needs of its urban population, while Hong Kong produces enough vegetables to meet around 45% of its needs.

As the availability of natural resources for food production becomes more constrained, the significance of urban and peri-urban areas of food production is likely to increase because of their access to urban waste streams. Recycled water from city water treatment plants, desalination plants and stormwater runoff could provide an increasingly secure source of water for food production in a warming and drying climate. Cities also have an abundant and under-utilised supply of organic waste that could provide an alternate source of nutrients for food production, as pressures on supplies of conventional fertilisers increase.

As cities expand to accommodate rapidly urbanising populations, areas of peri-urban food production with access to fertile soils, water and valuable waste streams could be lost to urban development. However, these regions of city fringe food production have the potential to play an increasingly important role in creating sustainable and resilient city region food systems in the context of increasing climate and natural resource pressures.

**Melbourne’s city region food system**

Melbourne is a sprawling city of around 4.3 million people in the state of Victoria in South-East Australia. Its city region food system includes multiple relatively small areas of food production scattered around the city fringe. The significance of these areas for food production is under-recognised. However, peri-urban Melbourne is one of the most productive agricultural regions in this part of Australia, and it produces a wide variety of foods.

Early findings from the Foodprint Melbourne project suggest that Melbourne’s peri-urban region currently produces enough food to meet 41% of the food needs of metropolitan Melbourne’s current population, including 82% of vegetables, 100% of eggs and poultry, 39% of dairy and 13% of fruit. Some areas of peri-urban Melbourne are highly significant for the supply of particular types of foods, such as Koo Wee Rup, an area around 60 km to the South-East of the city, which produces over 90% of Australia’s asparagus.

The areas of food production close to Melbourne’s two main water treatment plants are relatively water-secure areas with access to recycled water to produce vegetables during drought. The Werribee Irrigation District, situated next to one of the city’s water treatment plants, grows around 10% of the vegetables produced in the state of Victoria. Towards the end of Australia’s Millennium Drought (which lasted from 1996 to mid-2010), vegetable production in this region became dependent on recycled water as river flows dropped to unsustainable levels.

Melbourne is Australia’s fastest growing city and the population is projected to rise to over 7 million in 2050, increasing the city’s demand for fresh food by around 60%. However, Australia’s cities have historically accommodated population growth by sprawling outwards, and if Melbourne continues to sprawl at its current rate, loss of farmland could reduce the

As cities expand to accommodate rapidly urbanising populations, areas of peri-urban food production with access to fertile soils, water and valuable waste streams could be lost to urban development.

**Melbourne’s peri-urban region currently produces enough food to meet 41% of the food needs of metropolitan Melbourne’s current population.**
capacity of Melbourne’s city region food system to support the food needs of the city’s growing population to 18% of food needs by 2050 (from 41% in 2015). The capacity of the peri-urban region to meet the city population’s need for fresh vegetables could reduce to 21% (from 82% in 2015).

However, if Melbourne is able to accommodate the predicted population increase in a way that contains urban sprawl and retains the city’s capacity for peri-urban food production, particularly in areas with access to recycled water, this city region food system could contribute to a more resilient city food supply in the face of increasing climate pressures on food production elsewhere in Southern Australia.

Impacts of climate change on food production in Southern Australia

Climate change is likely to reduce the capacity for food production across Australia, with strong drying and warming expected in Southern and Eastern Australia. Figure 1 shows the significant drying that has already occurred across Southern Australia and how severely the state of Victoria has already been affected.

The impact of climate change is likely to be particularly significant in the irrigation districts of the Murray-Darling Basin, Australia’s main region of food production. Estimates of the potential loss of food production capacity range from an overall 17% decline in Australian production to a 92% drop in irrigated agricultural production in the Murray-Darling Basin by 2100, in the context of a high emissions scenario and no global adaptation.

In addition to the impacts of gradual warming and drying, increasing extreme temperatures and weather events are likely to affect food production. Crops such as fruit and vegetables are particularly vulnerable to these changes, especially plants that are sensitive to the impacts of extreme weather events, a reduction in winter chilling or the effects of heat stress. In 2009, a heatwave in Victoria resulted in the loss of 20-25% of the apple crop and 60-80% of the strawberry crop in the Port Philip region. Declines in dairy production of up to 7% are also expected in Victoria.

If Melbourne continues to sprawl at its current rate, the city’s peri-urban region may only be able to meet 18% of the city’s food needs by 2050.
Cities can contribute to sustainable and resilient food systems

In the context of growing climate pressures and decreasing availability of natural resources, city region food systems create opportunities for resilient and sustainable food production under increasingly challenging conditions. Cities are not always regarded as obvious sites of food production, but they have good access to the necessary resources.

<table>
<thead>
<tr>
<th>Sustainable and resilient food systems need...</th>
<th>Cities have ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertile land</td>
<td>Areas of highly fertile land - cities were often founded in places with highly fertile land to provide a secure food source for their growing populations</td>
</tr>
<tr>
<td>Water</td>
<td>Access to secure sources of recycled water from city water treatment plants and desalination plants, as well as storm water from urban water catchments</td>
</tr>
<tr>
<td>Fertilisers</td>
<td>Abundant supplies of under-utilised organic waste that can be converted to compost and utilized for food production</td>
</tr>
<tr>
<td>Labour</td>
<td>Access to sources of labour that may be scarcer in more remote and regional areas</td>
</tr>
<tr>
<td>Food processing infrastructure</td>
<td>Good access to infrastructure for secondary food processing and manufacturing</td>
</tr>
<tr>
<td>Transport infrastructure</td>
<td>Good road systems and transport links to move fresh foods quickly and efficiently to population centres</td>
</tr>
<tr>
<td>Proximity to markets</td>
<td>Close proximity to key markets for fresh foods in major population centres</td>
</tr>
</tbody>
</table>

The cooler average conditions of Southern Victoria (relative to the rest of Australia) will be part of a shrinking area capable of conducting cooler climate agriculture the kind of agriculture that has been possible over most of the southern part of Australia up till now.

Source: CSIRO and Bureau of Meteorology 2015, in Hughes et al. 2015.
For more information about the Foodprint Melbourne project, see the [project website](#) or contact:

5. Milan Urban Food Policy Pact, 15 October 2015. The City of Melbourne is a signatory to the Milan Urban Food Policy Pact, and developed a city food policy in 2012.
11. Carey, R; Sheridan, J and Larsen, K (2015) To feed growing cities we need to stop urban sprawl eating up our food supply. The Conversation, 26 October 2015.
12. Reisinger et al. (2014) as above.
14. Reisinger et al. (2014) as above.
MELBOURNE’S FOODBOWL

Now and at seven million

A Foodprint Melbourne report
December 2015
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Melbourne is located at the centre of a highly productive agricultural area – it is a city surrounded by its own foodbowl. This report from the Foodprint Melbourne project explores the capacity of Melbourne’s foodbowl to feed Greater Melbourne now and with a projected population of 7 million in 2050. It is the first project of its kind in Australia to model the capacity of a city foodbowl and the impact of urban sprawl on production in the foodbowl.

The key findings of this research include:

- Melbourne’s foodbowl includes multiple relatively small areas of food production scattered around the city fringe
- Melbourne’s foodbowl produces a wide variety of fresh foods, particularly fresh fruit and vegetables, but also eggs and chicken meat, and some beef, lamb, pork and dairy
- Melbourne’s foodbowl produces around 47% of the vegetables grown in Victoria and around 8% of fruit
- Highly perishable foods, such as leafy greens and berries, are typically grown in the inner foodbowl, close to the city. The outer foodbowl produces a more diverse range of foods that includes fewer perishable foods, such as fruit and vegetables, but more livestock products and some oilseeds
- Melbourne’s population is predicted to grow to at least 7 million by 2050, and Melbourne will require 60% more food to meet the population’s needs
- By 2050, around 16% of the farmland in Melbourne’s foodbowl could be lost if current urban density trends continue, including up to 77% of farmland in the inner foodbowl
- Melbourne’s foodbowl currently produces enough food to meet around 41% of the food needs of Greater Melbourne’s population, but by 2050 urban sprawl could reduce the capacity of the city’s foodbowl, so that it can only produce enough food to meet 18% of the city’s food needs
- Melbourne’s foodbowl currently produces enough vegetables to meet 82% of Greater Melbourne’s needs, but by 2050, urban sprawl could reduce the capacity of the foodbowl to meet Greater Melbourne’s vegetable needs to around 21%
- If Melbourne is able to accommodate the predicted population increase in a way that contains urban sprawl and retains the city’s capacity for peri-urban food production, Melbourne’s foodbowl could contribute to a more resilient city food supply in the face of increasing climate pressures on food production

Executive Summary
1.1 Introduction

Foodprint Melbourne is a two-year project that investigates Melbourne’s ‘foodbowl’, the highly productive agricultural region on the city fringe. It is the first project of its kind in Australia to model the capacity of a city foodbowl and the potential impact of losing farmland on food production.

Foodprint Melbourne explores the capacity of Melbourne’s foodbowl to feed Greater Melbourne now and with a projected population of 7 million in 2050. It also explores the city’s ‘foodprint’ – the amount of land, water and energy required to feed the city, and the amount of greenhouse gases and waste that are generated.

Like many other world cities, Melbourne was founded in an area with fertile soils and good water resources to provide a reliable source of food for its population. Melbourne still produces a considerable amount of fresh food on its peri-urban fringe, enough to meet around 41% of the food needs of Greater Melbourne’s current population. However, the significance of ‘Melbourne’s foodbowl’ is under-recognised, and foodbowl areas are being lost to urban development as the city continues to expand to accommodate a rapidly growing population.

This report explores the diversity of production in Melbourne’s foodbowl, its significance for the city’s food supply and its potential to contribute to a more resilient and sustainable food system for Melbourne in the context of rapid population growth and increasing climate pressures.

1.2 About this report

This report:

- Presents the findings from Part 1 of the Foodprint Melbourne project about Melbourne’s ‘Foodbowl’;
- Explores the potential implications of Melbourne’s projected population growth for food production in the foodbowl and the capacity of the foodbowl to feed the city; and
- Describes the methodology and data sources used for the research.
1.3 Research method

Throughout the report, the research method and data sources are summarised in breakout boxes, so that the research findings can be further explored and the research approach can inform similar studies in other cities.

This research uses the Australian Stocks and Flows Framework (ASFF), which is a database and simulation system that is used to understand physical processes and resource flows (e.g. use of land, water, energy) across the domestic economy.

The ASFF can be used to explore scenarios of potential outcomes in the future as a result of actions and policy choices made now. In this project, it has been used to evaluate the potential impact of urban sprawl, and to validate other data sets by checking them against long-term trends1.

This research has revealed some gaps and challenges in analysis of city-region food systems in Australia, and these challenges are discussed in Section 5.

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This section defines Melbourne’s foodbowl and describes what grows in its inner and outer foodbowl regions.

2.1 Introducing Melbourne’s foodbowl

Melbourne is located at the centre of a highly productive agricultural area – it is a city surrounded by its own foodbowl. The term “foodbowl” is often used to describe productive regional areas of Australia, such as the Murray Darling Basin, that are an important source of food. The urban fringes of Australia’s major cities are not typically thought of as “foodbowls”, but are some of the most highly productive agricultural regions in Australia.

Melbourne’s foodbowl comprises many small highly productive regions scattered around the fringe of the city. The Foodprint Melbourne project divides these regions into two areas – an ‘inner foodbowl’ and an ‘outer foodbowl’.

The inner foodbowl is the metropolitan area of Greater Melbourne – it includes urban local government areas and the “Interface Councils”, the local government areas that are on the edge of the metropolitan fringe and border the city’s Urban Growth Boundary (see Figure 1). The inner foodbowl includes well-known areas of food production, such as the Yarra Valley and the Mornington Peninsula, as well as lesser known regions, such as Cranbourne and Koo Wee Rup to the south-east of Melbourne, and Werribee to the west.

The outer foodbowl is the next ‘ring’ of peri-urban local government areas that includes regions in the “Peri-Urban Group of Rural Councils”, such as Bacchus Marsh and Baw Baw Shire.

Other areas of food production outside Melbourne’s foodbowl are also important in feeding Greater Melbourne. These include areas just outside the city’s foodbowl in Melbourne’s hinterland, as well as areas of regional Victoria, such as the Murray Darling Basin. Indeed, Greater Melbourne is fed by a global food system that includes other states of Australia, as well as other regions of the world. State, national and global sources of food are all important to the stability and resilience of Melbourne’s food system.

However, this study focuses specifically on the capacity of peri-urban Melbourne to feed the city.

Melbourne’s foodbowl, including its ‘inner’ and ‘outer’ regions, are illustrated in Figure 1 on the following page. For a full list of the local government areas included in these regions, see Appendix 1.
2.2 Food production in Melbourne’s foodbowl

Melbourne’s foodbowl produces a wide variety of fresh foods, particularly fresh fruit and vegetables, but also eggs and chicken meat, and some beef, lamb, pork and dairy. Melbourne’s foodbowl produces around 47% of the vegetables grown in Victoria and around 8% of fruit.\(^3\)

Highly perishable foods, such as leafy greens and berries, are typically grown in the inner foodbowl, close to the city. The outer foodbowl produces a more diverse range of foods that includes fewer perishable foods, such as fruit and vegetables, but more livestock products and some oilseeds.

Some areas of Melbourne’s foodbowl are highly significant for the production of particular types of crops, because they have soil types, climates or other growing conditions that are ideally suited to those crops. For example, the Yarra Valley produces around 78% of Victoria’s strawberries, and Koo Wee Rup grows over 90% of the nation’s asparagus. See the foodbowl “snapshots” 12, 13, and 16 for other examples.

Food production in Melbourne’s foodbowl is typically intensive, high value production that takes place on relatively small areas of land. Food production that requires more land tends to take place outside Melbourne’s foodbowl in regional Victoria. This includes production of dairy, cereals (e.g. wheat and barley), oilseeds (e.g. canola) and pulses (e.g. lentils), as well as much of Victoria’s livestock grazing. Regional Victoria also accounts for a high proportion of Victoria’s fruit production, including the stone fruit industries concentrated around Shepparton, the citrus and grape industry based in Mildura, and other fruit growing areas located within the Murray-Darling Basin.

There are a number of crops that Victoria produces little or none of. Rice is an “opportunity crop” that is only produced during years of high water availability in the Murray-Darling and Murrumbidgee Basins in northern Victoria and New South Wales. Other crops that require tropical conditions are grown elsewhere in Australia e.g. sugar cane or fruits like bananas and pineapples.


4. Australian Department of Agriculture and Water Resources (2015), ‘Rice’
Casey, Cardinia, and the Mornington Peninsula

What grows there?
Almost all of Australia's asparagus production (90%) occurs in Casey-Cardinia thanks to rich, peaty soils. The area also produces a broad variety of vegetable crops, including 70% of the state's herbs, and a little less than one fifth of the state's pumpkins, potatoes, and blueberries.

Mornington Peninsula's frost-free maritime climate supports a broad range of production, including a third of Victoria's lettuce production, a quarter of the state's herbs and around 15% of a variety of horticultural crops, including strawberries and broccoli.

Almost a third of the state's chicken meat production occurs in the South-East, split across Mornington Peninsula and Casey-Cardinia. The area also produces excellent pastures and fodder crops that support beef cattle, some dairy cattle, and sheep for mutton and lamb.

History of the area
Market gardens have been under cultivation in the area since the late 1890s, and have made important contributions to Melbourne's food supply. In 1973, the suburbs of Clyde and Dalmore provided around 40% of Melbourne's onions, 15% of its potatoes, and 66% of its tomatoes.

In recent decades Mornington Peninsula has developed an increasingly strong agritourism and artisanal produce sector, including u-pick farms reliant on proximity to Melbourne.

Strengths
This area has some of the state's richest soils and access to recycled water, making it a relatively drought-resilient area. The Eastern Treatment Plant is Melbourne's second largest water treatment plant, which currently produces 21 gigalitres of Class A recycled water each year.

Challenges
The farmland in Melbourne's South-East encapsulates the advantages and challenges of farming on the city fringe. The land is highly productive across a range of commodities. However, large areas of farmland in Casey have been lost to urban development in recent expansions of the Urban Growth Boundary.

Werribee South

What grows there?
Werribee South, 30 kilometres to Melbourne's west, is Victoria's brassica and leafy greens powerhouse. This small suburb with only 0.02% of the state's agricultural land produces 10% of Victoria's vegetables, including:
- 85% of the state's cauliflower
- 53% of the state's broccoli
- 34% of Victoria's lettuce

History of the area
Werribee South has over 3100 hectares of market gardens on rich basalt soils that were turned over to irrigated farming in the 1920s. It's an area of Italian heritage, with strong community and family relationships across farms as the original 12 farms of the 1920s have been divided and passed down to each generation since.

Strengths
One of Werribee South's greatest strengths is its potential to become a drought-proof foodbowl area. The Werribee South market gardens are located next to Melbourne's Western Treatment Plant. During the Millennium Drought, water allocations from Werribee River fell to just 5% of the usual allocation and a ban was placed on pumping groundwater due to risks to the water table, but market gardeners were able to continue producing vegetables using recycled water from the water treatment plant.

Challenges
Recycled water from the water treatment plant is more saline than the river water, and some farmers have experienced negative impacts on crops as a result. Reducing the salinity of the water is an ongoing challenge.

5,6,7. ABS (2013) as previously.
11. ABS (2013) as previously.
12. Wyndham City Council (2014) ‘Agricultural Competitiveness’
13. Rodda C (2008) ‘Background to the establishment of the scheme’
2.3 Inner foodbowl

The inner foodbowl produces substantial amounts of many highly perishable crops. The area represents just 2% of Victoria’s agricultural land, but contributes a significant proportion of the state’s total production of some fruits and vegetables, including:

- 96% of berry fruits
- 94% of asparagus
- 92% of cauliflowers
- 88% of mushrooms
- 66% of broccoli
- 62% of lettuce
- 93% of herbs

The inner foodbowl also produces 35% of the state’s eggs and 59% of the state’s chicken meat. The highly perishable foods produced in the inner foodbowl benefit from being close to markets, sources of labour and food processing facilities. Many of the fruit and vegetable crops also rely on rich soil and reliable access to water, and most of the fruit and vegetable production in the inner foodbowl is concentrated in a relatively small irrigated area.

Almost half of the land in the inner foodbowl region is used for agriculture, but only 4% of this land is irrigated. However, this small amount of irrigated land makes an extraordinary contribution to Victoria’s agricultural production, with 86% of vegetable production and 61% of fruit production occurring on irrigated land.

2.4 Outer foodbowl

The outer foodbowl is also highly productive. The outer foodbowl is a diverse region of food production that grows between 10 and 15% of a broad range of crops, including fruit and vegetables, as well as livestock. However, the region produces fewer highly perishable crops, such as leafy greens and berries. The outer foodbowl produces:

- 40% of the state’s potatoes
- 32% of eggs
- 24% of chicken meat
- 19% of onions
- 46% of sunflowers

Livestock production in the outer foodbowl includes raising of sheep, beef cattle, dairy cattle and pigs. Significant amounts of chicken meat and eggs are also produced in both the inner and outer foodbowl regions.

Sheep and cattle are typically raised in ‘extensive’ grazing systems on pasture. However, chicken meat, egg and pig meat production is mostly ‘intensive’, rather than free range production, as is typical of these industries. Around 95% of pig meat in Australia is intensively produced, 85% of chicken meat and around 70% of eggs. Although demand for free range production is increasing, free range systems require more land, which could constrain the expansion of free range production in Melbourne’s foodbowl, particularly in the inner foodbowl region.

Data sources

Data about production in the foodbowl region is based on the ABS Agricultural Commodities 2010-2011. This data provides the most detailed available breakdown of crops grown in the foodbowl area. The total production of specific crops in the foodbowl was calculated by summing together data from all SA2 areas in the foodbowl. SA2 areas provide detailed data on local areas similar in size to a suburb.

Water

Conservation and natural environments

Intensive uses

Irrigated production

Unirrigated production

Figure 2: Current Land Use in the Inner Foodbowl

Figure 3: Proportion of Victoria’s Food Production from Foodbowl Regions

15. Over half of this irrigated area in the foodbowl is used to produce fruit and vegetables, calculated from ABS (2014b) ‘Water Account 2012-13’, cat. no. 4611.0
16. ABS (2014b) as previously.
18. ABS (2010) as previously. NB. Chart capped at 1,000,000 tonnes, but dairy and cereal grain production is greater than this.
Bacchus Marsh
What grows there?
Like many other outer foodbowl regions, Bacchus Marsh has a broad range of farming activities that include broadacre cropping and livestock grazing, as well as fruit and vegetable production.

Of the foodbowl’s total production, Bacchus Marsh contributes:
• 11% of both cereal grains and oil crops
• 8% of legumes
• 4% of fruit
• 2% of vegetables
It also has 13% of the foodbowl’s pigs, 4% of its sheep, and 2% of its meat cattle.

History of the area
Bacchus Marsh was developed for agriculture in the 1860s, with a focus on large grazing properties. Immigrants from diverse backgrounds brought a wide range of farming traditions from their home countries, which influenced practices in the area. Until the 1930s there was significant dairy farming in the area, with a number of processing plants in Bacchus Marsh. The development of irrigation in Bacchus Marsh allowed orchards to be planted, which have been retained as a key crop.

Strengths
While much of the lands to Melbourne’s west are dry grassland and plains which have been used for sheep and cattle grazing, the river flats along Lerderderg River and Werribee River have long been cultivated thanks to their water access and alluvial soils.

Challenges
Agricultural production in the region has felt the impact of droughts. There is also ongoing pressure to rezone farmland for housing.

---

Foodbowl snapshot:

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This section outlines how much food is required to feed Melbourne and how much of this food can be produced by Melbourne’s foodbowl.

### 3.1 How much food is needed to feed Melbourne?

Greater Melbourne’s current population of around 4.37 million requires around 15,080 tonnes of food per day, which is equivalent to around 3.45kg per person.

Melbourne’s food needs have been estimated based on the average Australian diet, using data from the Australian Health Survey\(^{24}\). The population of Melbourne is defined as the population of Greater Melbourne\(^{25}\), which is also equivalent to the population of the ‘inner foodbowl’ region. See the ‘Data sources’ breakout box for more information about the data and calculations behind this estimate. The typical daily Australian diet is detailed in Table 2 below.

#### Table 2: Per capita Food Requirements in the Typical Australian Diet

<table>
<thead>
<tr>
<th>Foodstuffs</th>
<th>Grams eaten per person per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy</td>
<td>322.4</td>
</tr>
<tr>
<td>Fruit</td>
<td>218.8</td>
</tr>
<tr>
<td>Vegetables</td>
<td>184.8</td>
</tr>
<tr>
<td>Cereal grains</td>
<td>144.3</td>
</tr>
<tr>
<td>Sugar</td>
<td>76.2</td>
</tr>
<tr>
<td>Chicken meat</td>
<td>51.7</td>
</tr>
<tr>
<td>Beef &amp; veal</td>
<td>48.1</td>
</tr>
<tr>
<td>Eggs</td>
<td>29.7</td>
</tr>
<tr>
<td>Pig meat</td>
<td>26.7</td>
</tr>
<tr>
<td>Seafood</td>
<td>26.6</td>
</tr>
<tr>
<td>Oils</td>
<td>23.2</td>
</tr>
<tr>
<td>Rice</td>
<td>19.4</td>
</tr>
<tr>
<td>Legumes</td>
<td>16.9</td>
</tr>
<tr>
<td>Mutton &amp; lamb</td>
<td>11.1</td>
</tr>
<tr>
<td>Nuts</td>
<td>8.4</td>
</tr>
<tr>
<td>Salt</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total food:</strong></td>
<td><strong>1210.2</strong></td>
</tr>
</tbody>
</table>

---

25. See Appendix 1 for the full list of local government areas included in the definition of Greater Melbourne.
To produce enough food to meet the average Australian’s requirement of 3.45 kg per day, significantly more food needs to be grown because a lot is wasted or spoiled. Estimates of food waste through the food supply chain range from 30-50%. For example, an extra 45% of fruit is required to compensate for inedible parts, such as apple cores or banana peels, as well as other waste, while it takes around 138 kg of sugar cane to produce 1 kg of sugar.

The amount of waste for each type of food has been taken into account in estimating the required production for Greater Melbourne’s current population of 4.37 million people. A total of 15,080 tonnes needs to be produced in order to feed Greater Melbourne. The breakdown of the food requirement is detailed below.

3.2 How much of Melbourne’s food can be produced by Melbourne’s foodbowl?

Melbourne’s foodbowl produces enough food to meet a substantial proportion of the food needs of Greater Melbourne – around 41%, as shown in Figure 5 (See Appendix 2 for more detail).
Melbourne’s foodbowl is able to meet a high proportion of the city’s food needs for some types of foods, including 82% of fresh vegetables (see Table 5). It also produces a surplus of some types of foods. (see Table 4).

Table 4: % of Melbourne’s Vegetable Needs Met by Melbourne’s Foodbowl

<table>
<thead>
<tr>
<th>Vegetable crop</th>
<th>Grams consumed per person each day</th>
<th>% of food needs met by inner foodbowl</th>
<th>% of food needs met by outer foodbowl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables overall</td>
<td>184.8</td>
<td>42%</td>
<td>42%</td>
</tr>
<tr>
<td>Potatoes</td>
<td>46</td>
<td>42%</td>
<td>&gt;100%</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>14</td>
<td>5%</td>
<td>7%</td>
</tr>
<tr>
<td>Carrots</td>
<td>9</td>
<td>22%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Broccoli</td>
<td>6.5</td>
<td>&gt;100%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Lettuces</td>
<td>5</td>
<td>18%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Onions and garlic</td>
<td>3</td>
<td>29%</td>
<td>92%</td>
</tr>
<tr>
<td>Mushrooms</td>
<td>1.4</td>
<td>&gt;100%</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Figure 6 shows the capacity of Melbourne’s foodbowl and regional Victoria to meet Melbourne’s food needs.

Data sources

The amount of food produced in regions of the foodbowl was estimated using production data from the ABS Agricultural Commodities 2010-2011. The production data was classified into the same food groups as the consumption data, and the proportion of Melbourne’s annual food needs met by the foodbowl was estimated by comparing food needs to food production for each food group. To determine the proportion of total food needs met by the foodbowl, the contribution each food group makes to the overall diet was multiplied by the fraction of food needs met by the foodbowl, and the figures for each food group were added together.

Combining production figures into broad food groups reduces the sensitivity of comparing food needs to production. For example, if 90% of our fruit consumption was a crop that doesn’t grow in the foodbowl, like tropical fruit, then the data would still show that we could meet 13% of our fruit needs locally, because we could meet those needs from other fruits that are produced in the foodbowl.

29. See Appendix 2 for detailed breakdown
3.3 How much food do Melburnians eat from Melbourne’s foodbowl?

It is possible to estimate how much food is consumed in Melbourne and how much food Melbourne’s foodbowl produces, but there is little data available to indicate how much of the food produced in the foodbowl is actually transported to and consumed in Greater Melbourne. Food imports to and exports from Australia are relatively well understood, but there is little publicly available data about how much food moves interstate or between major population centres within states. For further details, see Section 5, Research Challenges.

Seasonal shifts in production also make it difficult to estimate how much of the food produced in the foodbowl is consumed in Melbourne. For example, the data indicate that the foodbowl could meet all of Melbourne’s needs for berry fruits. However, it is unlikely that this is the case because berries are produced during a distinct season, whereas consumers have become accustomed to eating most foods year-round and are likely to source berries from other states or overseas outside of the Victorian production period.

The table below shows the seasonality of strawberry production across Australia, and the proportion of Australia’s total strawberry production from each state. This suggests that Greater Melbourne sources berries from other states during its winter, and that Melbourne’s foodbowl most likely meets other states’ berry needs during its production season. Similar patterns of seasonal production and sourcing can be expected across most fresh fruit and vegetable crops.

For some foods, other parts of Victoria or Australia are inherently more suitable for production than Melbourne’s foodbowl, so demand in Melbourne is unlikely to ever be met from the foodbowl. For example, bananas make up about 8% of Melburnians’ fruit intake31, but 95% of Australia’s banana-growing is concentrated in Queensland32.

Table 5: Australian Seasonal Availability of Strawberries30

<table>
<thead>
<tr>
<th>State</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>% of Total Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>32%</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

For some foods, other parts of Victoria or Australia are inherently more suitable for production than Melbourne’s foodbowl, so demand in Melbourne is unlikely to ever be met from the foodbowl. For example, bananas make up about 8% of Melburnians’ fruit intake31, but 95% of Australia’s banana-growing is concentrated in Queensland32.

31. ABS (2014) as previously
4.1 How much food will be needed to feed Melbourne in 2050?

Melbourne is Australia’s fastest growing capital city\(^3\), and Greater Melbourne is projected to reach a population of around 7 million by 2050\(^4\). The population in the outer foodbowl is also likely to increase by 80%, reaching almost 900,000 by 2050 (the population of the outer foodbowl is not included in the estimate of Greater Melbourne’s population).

If Melbournians eat the same diet as they currently consume\(^5\), and a similar amount of food is wasted through the food chain, Greater Melbourne will require 60% more food to feed its population by 2050 – around 24,132 tonnes of food per day, at an average of 3.45 kg per person.

4.2 Land loss in Melbourne’s foodbowl

By 2050, Melbourne’s population is likely to grow by at least an additional 2.63 million people to reach a population of 7 million. This analysis models the possible impact of the predicted population growth on loss of agricultural land and productive capacity in Melbourne’s foodbowl. If population growth is accommodated at the current rate of urban density, that is, it models the potential impacts of maintaining the current trend.

Density rates approved by the Metropolitan Planning Authority\(^6\) were used, closely validated against Melbourne’s urban growth trend from 1946 to now. If the current rate of urban density is maintained, population growth will likely continue to displace farmland to provide the houses and infrastructure needed to support 7 million people by 2050. At the existing rate of urban density, Melbourne’s Urban Growth Boundary (UGB) is also likely to continue to be exceeded. The current Victorian state government has indicated that it intends to maintain the existing UGB\(^7\). However, Melbourne’s UGB has been moved four times since it was instituted as a permanent boundary in 2002\(^8\). There is ongoing pressure for further expansion, and the State Planning Policy Framework currently lacks effective measures to prevent further loss of productive agricultural land\(^9\).

There is likely to be greater loss of farmland in the inner foodbowl compared to the outer foodbowl, because higher population growth is predicted to occur in this region\(^10\). As a result, the impact on foods grown mostly in the inner foodbowl region, such as vegetables, is likely to be particularly significant (see the next section).

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Data sources

The estimate of Melbourne’s population in 2050 is based on projections from “Victoria in Future 2015” published by the Department of Environment, Land, Water, and Planning. Projections for Melbourne’s population at 2050 vary from 7 million to almost 8 million, with different fertility and migration assumptions underlying the various figures. Plan Melbourne predicts that Melbourne “could grow by another 3.4 million people to become a city of around 7.7 million people by 2051\(^9\). However, the more conservative estimates used in this project place Melbourne’s growth at closer to 7 million by 2050.

The estimate of the food required to feed Greater Melbourne in 2050 is based on the average Australian diet consumed in 2015, and the same rate of food waste (see section 3.1). The average requirement per person has been multiplied by a population figure of 7 million.
This estimate of the amount of farmland that is likely to be lost in Melbourne’s foodbowl by 2050 has been modelled using the Australian Stocks and Flows Framework, drawing on population data from the Victorian Government and land use data from the Australian Bureau of Statistics. The estimate draws on land use data from 2012 and therefore includes land that was still in agricultural production at that time, but has already been rezoned for urban development. In some cases, this land has already been converted to urban uses. See the section on ‘Data sources’ for further information.

By 2050, the area required for intensive use in Greater Melbourne could increase to around three quarters of the total land area in order to accommodate the predicted population growth. Many of the local government areas that are likely to see significant population growth are food-growing regions in Melbourne’s foodbowl: while the Victorian population is projected to increase by almost 40% between now and 2031, Casey’s population is predicted to increase by 66%, Cardinia by 113%, Wyndham by 116%, Melton by 130%, and Mitchell by 145%.

By 2050, the area required for intensive use in Greater Melbourne could increase to around three quarters of the total land area in order to accommodate the predicted population growth. Many of the local government areas that are likely to see significant population growth are food-growing regions in Melbourne’s foodbowl: while the Victorian population is projected to increase by almost 40% between now and 2031, Casey’s population is predicted to increase by 66%, Cardinia by 113%, Wyndham by 116%, Melton by 130%, and Mitchell by 145%.

4.3 How much of Melbourne’s food needs will be met by the foodbowl in 2050?

Losing around 16% of farmland to accommodate a population of 7 million by 2050 would have a significant impact on the capacity of Melbourne’s foodbowl to produce food. At the same time, the demand for food will increase by 60% to meet the food needs of an extra 2.63 million people. As a result, the foodbowl’s capacity to meet the food needs of Greater Melbourne’s population is likely to fall from 41% in 2015 to 18% by 2050. The impact on production in the foodbowl is likely to vary across food types (see Table 6). Only 2% of legume production is likely to be lost, but 59% of vegetable production and 64% of fruit production.

<table>
<thead>
<tr>
<th>% of production lost in the foodbowl by 2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit</td>
</tr>
<tr>
<td>Vegetables</td>
</tr>
<tr>
<td>Chicken meat</td>
</tr>
<tr>
<td>Eggs</td>
</tr>
<tr>
<td>Beef &amp; veal</td>
</tr>
<tr>
<td>Dairy</td>
</tr>
<tr>
<td>Cereal grains</td>
</tr>
<tr>
<td>Pig meat</td>
</tr>
<tr>
<td>Mutton &amp; lamb</td>
</tr>
<tr>
<td>Oils</td>
</tr>
<tr>
<td>Legumes</td>
</tr>
</tbody>
</table>

Table 6: Estimated Loss of Production in Melbourne’s Foodbowl by 2050

By 2050, the area required for intensive use in Greater Melbourne could increase to around three quarters of the total land area in order to accommodate the predicted population growth. Many of the local government areas that are likely to see significant population growth are food-growing regions in Melbourne’s foodbowl: while the Victorian population is projected to increase by almost 40% between now and 2031, Casey’s population is predicted to increase by 66%, Cardinia by 113%, Wyndham by 116%, Melton by 130%, and Mitchell by 145%.

The capacity of Melbourne’s foodbowl to meet Greater Melbourne’s food needs is likely to fall to 18% in 2050.
This will particularly affect production of vegetable crops in the inner foodbowl as 86% of vegetable crops are irrigated, and they occupy almost 44% of all irrigated land. Losses of unirrigated farmland are also likely to affect vegetable production. As a result, urban expansion could displace the majority of vegetable production in Melbourne’s inner foodbowl. Vegetable production in Melbourne’s outer foodbowl is likely to be less affected. However, the capacity of Melbourne’s foodbowl to meet the city’s vegetable needs is likely to fall from 82% in 2015 to 21% by 2050. Losses of unirrigated farmland are also likely to affect vegetable production. As a result, urban expansion could displace the majority of vegetable production in Melbourne’s inner foodbowl. Vegetable production in Melbourne’s outer foodbowl is likely to be less affected. However, the capacity of Melbourne’s foodbowl to meet the city’s vegetable needs is likely to fall from 82% in 2015 to 21% by 2050.

Livestock and dairy production in Melbourne’s foodbowl is likely to be less affected, because it is more concentrated in the outer foodbowl, where there is expected to be less urban sprawl. However, the foodbowl’s capacity to meet Greater Melbourne’s dairy needs could fall from 39% of total needs currently to 22% in 2050. The capacity of the foodbowl to meet requirements for red meat will fall from around 37% of total needs currently to 34% in 2050.

Some food groups (pig meat, chicken meat and eggs) were not included in our land use calculations due to a lack of data about land requirements, and will likely lose more production than is indicated here.

Data sources
The impact of the projected loss of farmland on production in Melbourne’s foodbowl was estimated using ASFF, as well as a range of external sources. The proportion of land used for irrigated and non-irrigated production was estimated using ABS Water Use on Farms cat. no. 4618 data. Livestock were measured as “head” of livestock, and the land used by livestock was estimated by applying the proportion consumed of volume of sown pasture to the hectares of sown pasture in the relevant area. However, pigs and poultry were not allocated a land area. Hectares of irrigated production were proportionally removed from land used by each crop and the proportion each crop used of the total “unirrigated” land remaining was estimated.
This project is the first of its kind in Australia to model the capacity of a city foodbowl and the impact of land loss on food production. It is therefore likely that there will be some gaps in the data and potential to improve the methodologies. In this section, we summarise some of the challenges encountered.

5.1 Data sources cover geographical areas with different ‘shapes’

One of the challenges in this project is changes in the shape of statistical areas across different years and datasets. For example, the ABS changed their standard statistical areas in 2006, which hinders direct comparison between pre- and post-2006 datasets. Where possible, data was drawn from the smallest statistical areas possible to create new areas which best matched the definitions of Greater Melbourne and Melbourne’s foodbowl. This data was also used to map the proportions of older statistical areas. Occasionally, direct comparison of data was not possible. In these circumstances, data was used that was representative of the area studied and the proportions of that area were applied.

5.2 ABS production data

Much of the data used for this project was drawn from government sources, either directly from government departments or from government agencies such as the Bureau of Meteorology and the Australian Bureau of Statistics. In some cases, this data had a high level of error or statistical inaccuracy. This project has used the best available data, with the knowledge that in places the best available data may not precisely reflect on-the-ground reality, particularly in ‘difficult to track’ fields such as agricultural commodities or freight. In general, ABS Agricultural Commodities data have been found to underestimate production, particularly in peri-urban areas, which often have multiple crops that are under constant harvest. Where detailed audits have been conducted, they have sometimes found significantly more production than is reported by the ABS.

Where there were known weaknesses in some ABS data, this project has attempted to mediate those by using ASFF to calibrate current data points with long-term historical data as a way of validating assumptions and trends. This modeling smooths “bumps” in data (e.g. decreased production during a drought year) and enables a focus on longer term trends.
5.3 Movements of food from production to consumption

This project has identified significant gaps in data about interstate and intrastate food freight movements in Australia, which have made it difficult to estimate how much of the food produced in Melbourne’s foodbowl is actually consumed in Melbourne.

Tracking the relationship between where food is produced and consumed requires detailed analysis of food supply chains, including distribution and retail networks. These are highly complex systems and they differ substantially for different kinds of food. This project has identified some potential data sources, but has not applied them at this stage. This is an ongoing area of investigation for the project.

5.4 Applying the Australian Stocks and Flows Framework to city region food systems

One of the aims of this project is to test the effectiveness of the CSIRO Australian Stocks and Flows Framework for analysis of city region food systems. This framework has to date been used for national or state-level modelling. Some of the challenges of using this framework for analysis at a city region scale include:

- A need to ‘convert’ data from regions at a small scale to match data sets at a larger scale
- Identifying where national averages are inappropriate to apply at a city region level e.g. grazing areas for livestock are larger on average across Australia than in Melbourne’s foodbowl
- Adjusting the settings for food system modelling to reflect specific regional conditions
This investigation of Melbourne’s foodbowl has revealed that Melbourne has significant capacity for food production on its city fringe. It currently produces a wide variety of foods and has the capacity to supply around 41% of Greater Melbourne’s food needs, including around 82% of the city’s demand for fresh vegetables.

This analysis also highlights the risk that urban sprawl could significantly reduce the capacity of Melbourne’s foodbowl, particularly for fresh vegetable production. The projections model the likely impacts on the foodbowl if the city continues to accommodate future population growth as it has in the past — at relatively low rates of urban density and with continued expansion of the Urban Growth Boundary. This finding has relevance to Australia’s other major cities, many of which have highly productive foodbowls on their urban fringes.

Melbourne draws its food supply from a complex global food system that includes regional Victoria, other states of Australia and other parts of the world. This investigation has found insufficient data to determine how much of the food produced in Melbourne’s foodbowl is consumed in the city of Melbourne and how much comes from other sources. However, local, regional, national and international sources are all likely to play a part in a resilient and stable future food supply.

The value of Melbourne’s foodbowl for the city’s future food supply has been overlooked in historical decisions about land use in foodbowl areas. Less than 10% of Australia’s soils are arable and suitable for agricultural production. Some of the best soils and most secure sources of water are located around Australia’s major cities. As the availability of natural resources for food production becomes more constrained, the importance of city foodbowls is likely to increase because of their access to urban waste streams, particularly recycled water. These issues will be considered further in later phases of this project.

Climate change will have a significant impact on agriculture in Australia through decreasing rainfall, rising temperatures, and increasing frequency of extreme weather events. This is likely to have a profound impact on food production in Southern Australia. A drying climate will decrease production in major national foodbowls, such as the Murray-Darling Basin. Melbourne’s foodbowl could play an important part in creating a more water-secure food supply through its access to alternative water supplies, such as recycled water. However, this will only be possible if productive farmland in the foodbowl is retained.

If Melbourne is able to accommodate the predicted population increase in a way that contains urban sprawl and retains the city’s capacity for peri-urban food production, Melbourne’s foodbowl could contribute to a more resilient city food supply in the face of increasing climate pressures on food production.

50. Houston P (2005) as previously
51. Buxton and Carey (2014) as previously
52. Houston (2005) as previously
54. See the Foodprint Melbourne briefing on ‘The role of cities in climate resilient food systems’ for more information.
Part 1 of this project has highlighted the significance of loss of farmland for the capacity of Melbourne’s foodbowl to support the food needs of the city’s growing population. This is an important first step in planning for Melbourne’s future food supply and understanding the implications of choices made now for the way that future generations will be fed.

Part 2 of the project will extend this investigation to explore the environmental impacts of producing the food required to feed Greater Melbourne’s population. It will also identify opportunities to reduce environmental impacts, and to strengthen the resilience and sustainability of the city’s food system.

Part 3 will assess the economic costs and benefits of strengthening the resilience and sustainability of Melbourne’s foodbowl. It will also explore opportunities for expanding food production in Melbourne’s foodbowl.

This project is the first of its kind in Australia to investigate the capacity of a city foodbowl and the impact of urban sprawl on this capacity. This analysis provides a basis on which to continue to build our understanding of Melbourne’s city region food system – and, most importantly - an evidence base that can contribute to re-designing this city region food system for a sustainable and resilient future.
**ABS**: The Australian Bureau of Statistics

**ASFF**: The Australian Stocks and Flows Framework is a CSIRO-developed model which was used extensively for future scenario modelling and historical data calibration across this project.

**BOM**: The Australian Bureau of Meteorology

**Inner Foodbowl**: The inner foodbowl is an area defined specifically for this research. It is made up of all the local government areas in metropolitan Melbourne and the interface councils. This set of local government areas also makes up Greater Melbourne and the two regions are equivalent. A full list of councils included in the definition is in Appendix 1.

**LGA**: This is an acronym for Local Government Area, which can also be thought of as a local city council.

**Melbourne's foodbowl**: Melbourne's foodbowl is used throughout this report to describe the highly productive farmland immediately surrounding Melbourne. It includes the inner foodbowl and the outer foodbowl. A full list of councils included in the definition is in Appendix 1.

**Outer Foodbowl**: The outer foodbowl is an area defined specifically for this research. It is made up of the ring of peri-urban local councils immediately contiguous to the inner foodbowl. A full list of councils included in the definition is in Appendix 1.

**SA1**: These are the ABS’s smallest area for representing statistical data (the same size as one mesh block). They are designed around a number of factors including population, population density, LGA boundaries, internal interconnectedness of roads within the area, and interactions between various industries and population centres. Rural SA1s generally have smaller populations than urban SA1s. SA1s have a population of between 200 and 800, with an average of 400.

**SA2**: These are the next size up of the ABS’s statistical data areas, and are built by bundling together a number of whole SA1s. They attempt to match gazetted suburbs where possible, although at times particularly large suburbs are broken up or numerous small suburbs are bundled together. This is done based on shared facilities and road networks, and common socio-economic traits. They are usually designed to not cross LGA boundaries. They have a population of between 3,000 and 25,000 with an average of 10,000.

**SA4**: These are the largest sub-state statistical area defined by the ABS. There are 17 in Victoria. They are made by bundling together SA2s based on labour markets so that, as much as possible, the population in each SA4 both lives and works in the one region. Rural SA4s typically have a population of between 100,000 and 300,000, while urban SA4s have populations of between 300,000 and 500,000.

### Glossary and definitions

**SECTION 6**
APPENDIX 1:
Defining Melbourne’s Foodbowl

Melbourne’s foodbowl consists of two regions – the inner foodbowl and outer foodbowl. The following local government areas are included in the definition of the inner foodbowl:

- Banyule City
- Bayside City
- Brimbank City
- Cardinia Shire*
- City of Borondara
- City of Casey*
- City of Darebin
- City of Glen Eira
- City of Greater Dandenong
- City of Kingston
- City of Maribyrnong
- City of Melton*
- City of Monash
- City of Moonee Valley
- City of Moreland
- City of Port Phillip
- City of Stonnington
- City of Whitehorse
- City of Whittlesea*
- City of Yarra
- Frankston City
- Hobsons Bay City
- Hume City*
- Knox City
- Manningham City
- Mornington Peninsula Shire*
- Nillumbik Shire*
- Wyndham City*
- Yarra Ranges Shire*

This group of local government areas includes urban areas, such as the City of Melbourne, and areas on the outskirts of Greater Melbourne – marked with an asterisk in the list above – which could be considered the ‘interface’ with the peri-urban zone.

The councils included in the outer foodbowl region are:
- Bass Coast Shire
- Baw Baw Shire
- City of Greater Geelong
- Golden Plains Shire
- MacedonRanges Shire
- Mitchell Shire
- Moorabool Shire
- Mumurindhi Shire
- Surf Coast Shire
### APPENDIX 2:

Food needs met from Melbourne’s Foodbowl

Melbourne’s current food needs and foodbowl production

<table>
<thead>
<tr>
<th>food group</th>
<th>Tonnes required each year to feed Melbourne</th>
<th>Proportion of Tonnes produced - inner foodbowl</th>
<th>Melbourne’s food needs inner foodbowl can meet</th>
<th>Tonnes produced - outer foodbowl</th>
<th>Proportion of Tonnes Melbourne’s food needs outer foodbowl can meet</th>
<th>Tonnes Melbourne’s food needs the foodbowl can meet</th>
<th>Proportion of Tonnes produced in regional Victoria</th>
<th>Melbourne’s food needs regional Victoria can meet</th>
<th>Melbourne’s food needs that Victoria can meet</th>
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<tbody>
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<td>Dairy</td>
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Melbourne at 7 million - food needs and foodbowl production

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<tr>
<th>food group</th>
<th>Tonnes required each year to feed Melbourne 2050</th>
<th>Tonnes produced - foodbowl in 2050</th>
<th>Proportion of Melbourne’s food needs foodbowl can meet</th>
<th>Tonnes produced - regional Victoria in 2050</th>
<th>Proportion of Melbourne’s food needs regional Victoria can meet</th>
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<td>Dairy</td>
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