A Local Food System for Saskatoon:

Envisioning Prosperous Rural Communities and Food-Secure Cities on the Canadian Prairies

by
Melodie Coneybeare

A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Master of Architecture

Waterloo, Ontario, Canada, 2011
© Melodie Coneybeare 2011

Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Perhaps nowhere in the world is the unsustainability of our current agricultural system more obvious than on the Canadian Prairies. Based not upon the ecological capacity of the land or the well-being of those who care for it, but upon industrial economies of scale and mass production, this fossil fuel driven system is not only causing environmental and cultural destruction which threatens the very ability of the ecosystem to continue producing food in a future of diminished fossil fuel resources, but as many recent studies have shown, the abundance of cheap grain being delivered by the system is doing more to increase hunger and human health problems around the world than to help alleviate them.

Fortunately, as more and more of us realize this and many other fallacies (e.g. that industrially produced food is safe, healthy and nutritious) being told by global agribusiness today, an alternative is emerging. By reconnecting with each other directly through things like CSAs and farmers' markets, producers and consumers around the world are making viable systems of production that are not only environmentally sound and culturally rewarding, but since they limit a community's dependence on globally traded commodities, also contribute to the building of an overall food system which is far healthier as well as far more equitable than the global industrial one we have today.

Through the development of a local food system (comprised of small-scale natural-systems-based production, rural processing and support centers, neighbourhood farmers' markets, and community support facilities) involving one urban and one rural community - between which there is a critical reciprocal relationship - this thesis investigates the scale of system required to feed a Prairie city of 200,000, and what the implications of this would be to both the food security of urban communities, as well as the economic and social vitality of surrounding rural communities.

Acknowledgements

First of all, I would like to thank my supervisor Professor John McMinn. I am grateful for your unending patience throughout this entire process, and I apologize for having taken so much of your time!

Erik - You know as well as I, that I could not have finished this without you, I love you so much! You deserve a gigantic holiday for having put up with this for so long. Let's go!

Mom, Dad and all my sisters - you guys are the best family a girl could ever ask for. I thank you all from the bottom of my heart for all the love and support you have given me throughout this process. I could not have done this spiritually (or financially!) without you. I owe you all big time.

I am also extremely grateful to Professors Tracey Winton, and Rick Andrighetti, your guidance and support throughout this process has been extremely helpful.

I would also like to thank my external examiner, Chris Hardwicke, for participating in the final stretch of this journey.

Dedication

I would like to dedicate this thesis to my Mom and Dad as well as the thousands of other men and women of this country who work hard every day to keep our tables full and our rural communities alive. May we work together to inspire a new generation of farmers capable of doing the same in a rapidly changing world.

Table of Contents

Front Matter — Author's Declaration ii

Abstract iii

Acknowledgements iv

Dedication v

List of Figures ix

Introduction 1

Chapter One — The Framework:
A 150 km Foodshed for Saskatoon 7

Chapter Two — The Elements:
A Study of Types for the South-East Sector 23

Chapter Three — A System for the South-East Sector 53

Chapter Four — Re-Imagining Craik:
Envisioning the Required Capacity of One Rural Community 93

(continued on following page)

Chapter Five — Markets in the Park: An Evolving System for Holliston and Breevort Parks 121

Conclusion 197

References 201

Appendices

Appendix One: Fruit and Vegetable Availability in Southern Saskatchewan 217

Appendix Two: Three Farm Models, an Elaboration 229

Appendix Three: Farm Model Yield Calculations 247

Appendix Four: Additional Information Regarding the Rural S-E Sector 259

Appendix Five: Urban Node-Making Elements, a Detailed Description 271

List of Figures

Fig. No.	Title/Source	Page
1.1	Title: *Ecoregions and Soil Zones of southern Saskatchewan with a 150 km Radius Inscribed around Saskatoon and Regina* Source: University of Regina, p. 881; University of Regina, p. 272. Redrawn by author.	9
1.2	Title: *A 150 km Foodshed for Saskatoon* Source: Various. Compiled and redrawn by author.	10
1.3	Title: *Rural Population Distribution of Saskatchewan, 1996, with a 150 km Radius inscribed around Saskatoon and Regina* Source: Fung, Ka-iu, et.al., p. 186. Redrawn by author.	11
1.4	Title: *Average Canadian Per Capita Food Consumption* Source: Drawn by author.	13
1.5	Title: *Sector Delineation in the Rural Portion of the Foodshed* Source: Drawn by author.	17
1.6	Title: *Major Physical Barriers in the Urban Portion of the Foodshed.* Source: Various. Compiled and redrawn by author.	18
1.7	Title: *Extent of Residential Zoning in the Urban Portion of the Foodshed* Source: City of Saskatoon. "Zoning Map" Retrieved from: http://www.saskatoon.ca/DEPARTMENTS/Community%20Services/Planning Development/Documents/Mapping/Wall_maps/Zoning_Map.pdf, 2008. Redrawn by author.	18

Fig. No.	Title/Source	Page
1.8	Title: *Sector Delineation within the Urban Portion of the Foodshed.* Source: Various. Drawn by author.	19
1.9	Title: *Rural Portion of the South-East Sector, key map.* Source: Drawn by author.	20
1.10	Title: *Rural Area of the South-East Sector.* Source: degraded/forested/pasture land as revealed by satellite imagery at www.maps.google.ca, 2008; various. Compiled and redrawn by author.	21
1.11	Title: *Urban Area of the South-East Sector.* Source: Drawn by author.	23
2.1	Title: *Wally's Urban Market Garden, Saskatoon, Saskatchewan.* Source: Wally's Urban Market Garden. See reference list. Retrieved 2008.	27
2.2	Title: *Four Season Farm, Harborside, Maine.* Source: Ableman, p. 179.	28
2.3	Title: *Windborne Farms, Scott Valley, California.* Source: Ableman, p. 43.	29
2.4	Title: *Meeting Place Organic Farm, Lucknow, Ontario.* Source: Organic Agriculture Centre of Canada. Retrieved from http://www.organicagcentre.ca/VirtualFarmTour/vft_mpof_june05.asp, 2008.	30
2.5	Title: *RockBottom Farm, Strafford, Vermont.* Source: RockBottom Farm blog, May 28, 2008. See reference list. Retrieved 2008.	31
2.6	Title: *Polyface Farms Inc., Shenandoah Valley, Virginia.* Source: Ableman, p. 215.	32

Fig. No.	Title/Source	Page
2.7	Title: *Sagehill Buffalo Ranch, Cudworth, Saskatchewan.* Source: Photo by author.	33
2.8	Title: *Open-air Livestock Killing Shed, Polyface Farms, VA.* Source: Sharon Nimtz at Picasa Web Albums. Retrieved from: http://picasaweb.google.com/SNimtz/PolyfaceJoelSalatinSFarmInSwoopeVASeptember2008#5428845012489998754, 2008.	36
2.9	Title: *Gate to Plate Food Services Inc., Fort St. John, B.C.* Source: Morrigan, Jan. 2005.	37
2.10	Title: *Dairy Processing Kitchen, Swatsworth Foundation, Germany* Source: currently unavailable.	38
2.11	Title: *Wildfire Organic Bakery & Cafe, Victoria, B.C.* Source: Slow Food Foundation for Biodiversity. Retrieved from: http://www.slowfoodfoundation.com/pagine/eng/presidi/dettaglio_presidi.lasso?-id=267&-nz=38&-tp=2, 2008.	39
2.12	Title: *Granville Island Public Market, Vancouver, B.C.* Source: Travlang Travel Guide. Retrieved from: http://www.travlang.com/blog/granville-island-perfect-shopping-place-for-tourists/, 2008.	42
2.13	Title: *Dufferin Grove Farmers' Market, Toronto, ON.* Source: Tzero at wordpress.com. Retrieved from: http://tzero.wordpress.com/category/parks/trinity-bellwoods/, 2008.	43
2.14	Title: *Seasonal Roadside Stand, Vicki's Veggies, Picton, ON.* Source: Vicki's Veggies. Retrieved from: http://www.vickisveggies.com/Contact_%26_Directions.html, 2008.	43
2.15	Title: *Year-round Farm Store, Pine View Farms, Osler, SK.* Source: Photo by author, 2008.	44

Fig. No.	Title/Source	Page
2.16	Title: *Online Directory, Local Harvest, USA.* Source: Screenshot by author, 2008.	44
2.17	Title: *Fairview Gardens CSA Program, Goleta, CA.* Source: Fairview Gardens CSA at wordpress.com. Retrieved from: http://fairviewgardenscsa.wordpress.com/about/, 2008.	45
2.18	Title: *Community Seed Bank, Mina Honda, Honduras.* Source: USC Canada. See reference list. Retrieved 2008.	48
2.19	Title: *The Center for Urban Agriculture at Fairview Gardens, Goleta CA.* Source: The Center for Urban Agriculture. See reference list. Retrieved 2008.	49
2.20	Title: *City Park Community Garden, Saskatoon, SK.* Source: Photo by author, 2008.	50
2.21	Title: *Community Canning Center, Citrus County, Florida.* Source: Board of County Commissioners, Citrus County, Florida. See reference list. Retrieved 2008.	50
2.22	Title: *Neighbourhood Root Cellar, Ecovillage at Ithaca, Ithaca, NY.* Source: Photo by author, 2007.	51
2.23	Title: *The Edible Schoolyard, Martin Luther King Jr. Middle School, Berkeley, CA.* Source: Cool Town Studios. Retrieved from: http://www.cooltownstudios.com/site/comments/the-experience-economy-comes-to-schools/, 2008.	51
3.1	Title: *A Framework of Rural Processing/Support Centers and Their Associated Rural Communities* Source: Drawn by author.	57

Fig. No.	Title/Source	Page
3.2	Title: *A Framework of Neighbourhood Farmers' Markets and Their Associated Urban Communities* Source: Drawn by author.	57
3.3	Title: *Schematic Diagram of Proposed Small-scale Natural-systems-based Production in the Rural Portion of the South-East Sector* Source: Drawn by author.	59
3.4	Title: *Schematic Diagram of Proposed Processing/Support Centers in the Rural Portion of the South-East Sector* Source: Drawn by author.	61
3.5	Title: *Schematic Diagram of Proposed Neighbourhood Farmers' Markets in the Urban Portion of the South-East Sector* Source: Drawn by author.	63
3.6	Title: *Schematic Diagram of Proposed Community Support Facilities in the Urban Portion of the South-East Sector* Source: Drawn by author.	65
3.7	Title: *Schematic Diagram, A case Study Area for both the Rural and Urban Area* Source: Drawn by author.	67
3.8	Title: *A Rural Case Study Area* Source: Drawn by author.	68
3.9	Title: Town Size/*Demographics within the Rural Portion of the Sector* Source: Statistics Canada, drawn by author.	69
3.10	Title: *Craik "Green Map"* Source: Craik Sustainable Living Project, led by Paul Stinson. Retrieved from: http://www.greenmap.org/greenhouse//node/164, 2009.	70

Fig. No.	Title/Source	Page
3.11	Title: *Current Sustainable Agricultural Initiatives within the Sector* Source: Map drawn by author. *CSIDC* photo: Agriculture and Agri-food Canada. Retrieved from: http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1186152258980&lang=eng, 2008. *Taylor Family Farm* photo: Retrieved from http://oapf.saskorganic.com/photos.html, 2008. *BFRF* photo: Stop the Hogs.com. Retrieved from: http://www.stopthehogs.com/extras/back_to_the_farm_research_founda.htm, 2008. *CSLP* photo: See 3.10 *Grainland Pasture* photo: Encyclopedia of Saskatchewan. Retrieved from: http://esask.uregina.ca/entry/community_pastures.html, 2008.	71
3.12/.13/.14	Title: *A System of 10 Rural Nodes; A System of 15 km Hinterlands; A Case Study Area* Source: Drawn by author.	73
3.15/.16	Title: *Flat fertile land; Hilly/degraded land* Source: Google maps street view, 2011	74
3.17	Title: *Craik's 15 km Hinterland* Source: Background aerial photo upon request from Information Services Corporation (ISC), 2008; Map of "Rural Municipality of Arm River No. 252", by Munisoft for the RM of Arm River, June 2005; Map of "Rural Municipality of Craik No.222", by Bradley Directories, April 25 2008.	75
3.18/.19	Title: *Craik Railscape; Craik Main Street* Source: Photos taken by author, 2008.	76

Fig. No.	Title/Source	Page
3.20	Title: *The Town Site of Craik, Saskatchewan* Source: Background aerial photo upon request from Information Services Corporation (ISC), 2008.	77
3.21	Title: *An Urban Case Study Area* Source: Drawn by author.	78
3.22	Title: *A Map of Node-making Elements within the Urban Sector* Source: Mapped and drawn by author.	79
3.23	Title: *The Distance of a 10 minute Walk.* Source: Drawn by author.	80
3.24	Title: *A System of 10 Potential Urban Nodes* Source: Drawn by author.	81
3.25	Title: *Frequency and Distribution of "Mixed-use Retail" Nodes in the Urban South-East Sector* Source: Drawn by author.	83
3.26	Title: *The Mixed-use Retail Node of Broadway Avenue* Source: Background image sourced from Google Earth, 2009.	83
3.27	Title: *Frequency and Distribution of "Main Neighbourhood Park" Nodes in the Urban South-East Sector* Source: Drawn by author.	84
3.28	Title: *Frequency and Distribution of "Multiple Main Neighbourhood Park" Nodes in the Urban South-East Sector* Source: Drawn by author.	85
3.29	Title: *The "Multiple Main Neighbourhood Park" Node of Breevort Park* Source: Background image sourced from Google Earth, 2009.	85

Fig. No.	Title/Source	Page
3.30/.31/.32	Title: *Holliston Park and Schoolyard; Calvin -Goforth Presbyterian Church; Medium Density Residential Units along 7th Street* Source: Google maps street view, 2011	86
3.33	Title: *The Node of Holliston Park* Source: Background image sourced from Google Earth, 2009.	87
3.34	Title: *The Node of Holliston Park's Surrounding Urban Community* Source: Background image sourced from Google Earth, 2009.	89
3.35	Title: *A System for Estimating Required Production and Distribution Capacity* Source: Drawn by author.	91
4.1	Title: *Production Capacity Required per Rural Community if in fact the system was required to deliver 80 percent of the entire sector's foodstuffs* Source: Figures from Statistics Canada, 2001. Drawn by author.	95
4.2	Title: *System of Farms Required in order to Provide 6,000 Prairie Residents with 80 percent of their Year-round Food Supply* Source: Drawn by author.	105
4.3	Title: *Production Summary 1* Source: Drawn by author.	106
4.4	Title: *Potential Arrangement of Vegetable Farms in and Around Craik* Source: Drawn by author.	107
4.5	Title: *Production Summary 2* Source: Drawn by author.	108

Fig. No.	Title/Source	Page
4.6	Title: *Potential Arrangement of Bison, Mixed Livestock, Dairy, Holistic Fruit, Grains and Cereals farm within Craik's 15 km Hinterland* Source: Drawn by author.	109
4.7	Title: *Bridging gaps: Community Greenhouses and Gardens* Source: Drawn by author.	110
4.8	Title: *Site Plan, West side of Town* Source: Drawn by author.	111
4.9	Title: *Building Reuse and In-fill on Main Street* Source: Drawn by author.	112
4.10	Title: *Site Plan, Main Street* Source: Drawn by author.	113
4.11	Title: *Small-scale Grain Storage and Test Plots along the Tracks* Source: Drawn by author.	114
4.12	Title: *Site Plan, along the Tracks* Source: Drawn by author.	115
4.13	Title: *Extending Main Street to the East Side of Town* Source: Drawn by author.	116
4.14	Title: *Site Plan, East of the Tracks* Source: Drawn by author.	117
4.15	Title: *Community Fruit Growing on the Eastern edge of Town* Source: Drawn by author.	118
4.16	Title: *Site Plan, the Eastern edge of Town* Source: Drawn by author.	119

Fig. No.	Title/Source	Page
5.1	Title: *Holliston Park Market Site Plan* Source: Drawn by author.	125
5.2	Title: *A Kit of Market Parts* Source: Drawn by author.	127
5.3/5.4	Title: *Vendor Space, Direct Truck Access;* *Vendor Space, Back to back Stalls* Source: Drawn by author.	129
5.5	Title: *Market Carts, the General System* Source: Drawn by author.	130
5.6/5.7	Title: *Marts Carts, Exposed;* *Market Carts, Sheltered* Source: Drawn by author.	131
5.8/5.9	Title: *Temporary Unloading, Back-in* *Temporary Unloading, Parallel Park* Source: Drawn by author.	133
5.10/5.11	Title: *Vendor Parking, Direct Access* *Vendor Parking, Satellite* Source: Drawn by author.	135
5.12	Title: *Servicing/Enclosure, Space Allocation Only* Source: Drawn by author.	137
5.13	Title: *Servicing/Enclosure, Services and Post Holes* Source: Drawn by author.	138
5.14	Title: *Servicing/Enclosure, Open-air Pavilions* Source: Drawn by author.	139

Fig. No.	Title/Source	Page
5.15	Title: *Servicing/Enclosure, Semi-enclosed Shelter with Storage* Source: Drawn by author.	140
5.16	Title: *Servicing/Enclosure, Fabric Canopies* Source: Drawn by author.	141
5.17	Title: *Servicing/Enclosure, Enclosed Building* Source: Drawn by author.	142
5.18	Title: *Servicing/Enclosure, Enclosed Cart Storage* Source: Drawn by author.	143
5.19	Title: *"Markets Components" Reference Legend* Source: Drawn by author.	145
5.20	Title: *Site Plan, Market System 1 - Infrastructure Required* Source: Drawn by author.	148
5.21	Title: *Site Plan, Market System 1 - Summer Market System* Source: Drawn by author.	149
5.22	Title: *Site Section, Market System 1 - Non-market Day* Source: Drawn by author.	150
5.23	Title: *Site Section, Market System 1 - Summer Market Day* Source: Drawn by author.	151
5.24	Title: *Site Plan, Market System 2 - Infrastructure Required* Source: Drawn by author.	152
5.25	Title: *Site Plan, Market System 2 - Summer Market System* Source: Drawn by author.	153

Fig. No.	Title/Source	Page
5.26	Title: *Site Section, Market System 2 - Non-market Day* Source: Drawn by author.	154
5.27	Title: *Site Section, Market System 2 - Summer Market Day* Source: Drawn by author.	155
5.28	Title: *Site Plan, Market System 3 - Infrastructure Required* Source: Drawn by author.	156
5.29	Title: *Site Plan, Market System 3 - Summer Market System* Source: Drawn by author.	157
5.30	Title: *Site Plan, Market System 3 - Winter Market System* Source: Drawn by author.	158
5.31	Title: *Site Plan, Market System 3 - Spring/Fall Market System* Source: Drawn by author.	159
5.32	Title: *Site Section, Market System 3 - Non-market Day* Source: Drawn by author.	160
5.33	Title: *Site Section, Market System 3 - Summer Market System* Source: Drawn by author.	161
5.34	Title: *Site Section, Market System 3 - Winter Market System* Source: Drawn by author.	164
5.35	Title: *Site Section, Market System 3 - Spring/Fall Market System* Source: Drawn by author.	165
5.36	Title: *Site Plan, Market System 4 - Infrastructure Required* Source: Drawn by author	166

Fig. No.	Title/Source	Page
5.37	Title: *Site Plan, Market System 4 - Summer Market System* Source: Drawn by author	167
5.38	Title: *Site Plan, Market System 4 - Winter Market System* Source: Drawn by author	168
5.39	Title: *Site Section, Market System 4 - Non-market Day* Source: Drawn by author	169
5.40	Title: *Site Section, Market System 4 - Summer Market System* Source: Drawn by author	172
5.41	Title: *Site Section, Market System 4 - Winter Market System* Source: Drawn by author	173
5.42	Title: *Site Plan, A Market for Breevort Park* Source: Drawn by author	177
5.43/5.44	Title: *Vendor Stalls; Market Carts* Source: Drawn by author	179
5.45	Title: *Temporary Unloading* Source: Drawn by author	180
5.46/5.47	Title: *Satellite Vendor Parking; Vendor Overflow Space* Source: Drawn by author	181
5.48	Title: *Site Plan, A Market for Breevort Park* Source: Drawn by author	183
5.49	Title: *Breevort Park, Year 1* Source: Drawn by author	184

Fig. No.	Title/Source	Page
5.50/5.51	Title: *Breevort Park, Year 2; Breevort Park Year 3* Source: Drawn by author.	185
5.52/5.53	Title: *Breevort Park, Year 4; Breevort Park Year 5* Source: Drawn by author.	186
5.54/5.55	Title: *Breevort Park, Year 7; Breevort Park Year 10* Source: Drawn by author.	187
5.56	Title: *The Final Breevort Market* Source: Drawn by author.	189
5.57	Title: *Testing the Capacity of Broadway Avenue* Source: Drawn by author.	191
5.58	Title: *Testing the Capacity of President Murray, Kilburn, Greystone and W.W. Ashley Parks* Source: Drawn by author.	193
5.59	Title: *Testing the Capacity of John Lake, Adelaide, and James Anderson Parks* Source: Drawn by author.	195
22.1	Title: *A Typical Plot of Wally's Urban Market Garden, Spring 2008.* Source: Photo taken by author.	232
22.2	Title: *Typical "High-value" and "Low-value" Crops of a SPIN® Farm* Source: Information from Satzewich and Christensen 2005(b). Drawn by author.	232
22.3	Title: *The Varying Crop Intensities of a SPIN® Farm* Source: Information from Satzewich and Christensen 2005(b). Drawn by author.	233

Fig. No.	Title/Source	Page
22.4	Title: *Schematic Diagram of a Typical "Intermediate" SPIN® Farm.* Source: Information from Satzewich and Christensen 2005(b). Drawn by author.	234
22.5	Title: *Estimated Total Yield of a Typical "Intermediate" SPIN® Farm.* Source: Drawn by author.	234
22.6	Title: *Yield Illustration of the "Saskatchewan Adaptation" of a SPIN® Half-acre Vegetable Farmer.* Source: Drawn by author.	235
22.7	Title: *System Summary of the "Saskatchewan Adaptation" of a SPIN® Half-acre Vegetable Farmer.* Source: Drawn by author.	235
22.8	Title: *Sample Temperatures (in degrees Celsius) Taken by Eliot Coleman illustrating the Climate-tempering Effects of Single- and Double-layer Unheated Crop Protection in Varying Winter Conditions.* Source: Coleman 1999.	237
22.9	Title: *The "Twice-tempered" Crop Protection System on Eliot Coleman's Four-Season Farm.* Source: Coleman 1999.	237
22.10	Title: *Mobile High-tunnels on Eliot Coleman's Four-Season Farm.* Source: Coleman 1999.	238
22.11	Title: *Crop Rotation System made possible by Mobile High-tunnels on Eliot Coleman's Four-Season Farm.* Source: Coleman 1999, 120. Redrawn by author.	239
22.12	Title: *Schematic Diagram of Eliot Coleman's 1.5 acre Farm.* Source: Drawn by author.	240

Fig. No.	Title/Source	Page
22.13	Title: *Estimated Total Yield of the Coleman's Four-Season Farm.* Source: Drawn by author.	240
22.14	Title: *From a Zone "3" to Zone "6" with Two Layers of Protection* Source: United States National Arboretum. "Plant Hardiness Zone Map." Retrieved from: http://www.usna.usda.gov/Hardzone/, 2008.	241
22.15	Title: *The Roughly Equal "Crop Units" of Four-Season Farm, the "Early" Farmer, and the "Late" Farmer.* Source: Drawn by author.	241
22.16	Title: *Schematic Diagram of the "Early" Vegetable Farm in Southern Saskatchewan.* Source: Drawn by author.	242
22.17	Title: *Estimated Total Yield of the "Early" Vegetable Farmer.* Source: Drawn by author.	242
22.18	Title: *System Summary of the "Early" Vegetable Farmer.* Source: Drawn by author.	242
22.19	Title: *Schematic Diagram of the "Late" Vegetable Farm in Southern Saskatchewan.* Source: Drawn by author.	243
22.20	Title: *Estimated Total Yield of the "Late" Vegetable Farmer.* Source: Drawn by author.	243
22.21	Title: *System Summary of the "Late" Vegetable Farmer.* Source: Drawn by author.	243
22.22	Title: *Schematic Diagram of the Developed Model of Integrated Holistic Fruit Production on the Prairies.* Source: Drawn by author.	245

Fig. No.	Title/Source	Page
22.23	Title: *System Summary of the Developed Saskatchewan Model of Integrated Holistic Fruit Production on the Prairies.* Source: Drawn by author.	245
33.1	Title: *Schematic Plot Layouts, Small-Plot Intensive Vegetable Production* Source: Information from Satzewich and Christensen 2005(b). Drawn by author.	248/249
33.2	Title: *Yield Calculations, Small-Plot Intensive Vegetable Production, Model Farm* Source: Various, see Reference List, 251. Compiled by author.	250
33.3	Title: *Yield Calculations, Small-Plot Intensive Vegetable Production, Saskatchewan Adaptation* Source: Various, see Reference List, 251. Compiled by author.	251
33.4	Title: *Schematic Diagram, Cool-Weather Vegetable Unit* Source: Drawn by author.	252
33.5	Title: *Schematic Diagram, Root Vegetable Unit* Source: Drawn by author.	253
33.6	Title: *Schematic Diagram, Warm-Weather Vegetable Unit* Source: Drawn by author.	253
33.7	Title: *Schematic Diagram, Extremely Warm-Weather Fruit and Vegetable Unit* Source: Drawn by author.	254
33.8	Title: *Yield Calculations, Cool-Weather, Root, Warm-Weather and Extremely Warm-Weather Vegetable Units* Source: Drawn by author.	255

Fig. No.	Title/Source	Page
33.9	Title: *Schematic Diagram, Berry Plot Inter-cropping on Integrated Holistic Fruit and Animal Production* Source: Drawn by author.	256
33.10	Title: *Yield/Income Calculations, Integrated Holistic Fruit and Animal Production* Source: Drawn by author.	257
44.1	Title: *Town Population Figures, 1981 to 2006* Source: Drawn by author.	260
44.2	Title: *The Two Largest Towns in the Sector: Outlook and Davidson* Source: Drawn by author.	261
44.3	Title: *The Largest Highway 11 Towns (besides Davidson): Dundurn, Hanley, Kenaston, and Craik.* Source: Drawn by author.	262
44.4	Title: *The Only other "Towns" within the Sector: Central Butte, Imperial, and Elbow.* Source: Drawn by author.	263
44.5	Title: *The Four Largest "Villages" within the Sector: Riverhurst, Simpson, Loreburn and Tugaske.* Source: Drawn by author.	264
44.6	Title: *Mid-sized "Villages" within the Sector: Glenside, Broderick, Hawarden, Liberty and Bladworth.* Source: Drawn by author.	265
44.7	Title: *The Four Smallest Officially Recognized Settlements within the Sector: Mistusinne, Strongfield, Aylesbury and Penzance* Source: Drawn by author.	266

Fig. No.	Title/Source	Page
44.8	Title: *Communities in the Sector with Populations of 25 or Less: Girvin, Stalwart, and Lawson* Source: Drawn by author.	267
44.9	Title: *Current Initiatives Promoting Small-scale Sustainable Agriculture within the Sector* Source: Map drawn by author. Photo sources same as Figure 3.11.	269
44.10	Title: *Craik "Green Map" and Legend* Source: Craik Sustainable Living Project, led by Paul Stinson. Retrieved from: http://www.greenmap.org/greenhouse//node/164, 2009.	270/ 271
55.1	Title: *Distribution of Public Parks within the Urban South-East Sector* Source: Map drawn by author.	275
55.1a	Title: *Rotary Park* Source: Wikipedia. "Rotary Park" Retrieved from: http://en.wikipedia.org/wiki/File:Rotary_Park.jpg, 2008.	275
55.1b	Title: *Meewasin Park* Source: Photo by author, May 2008.	275
55.1c	Title: *Greystone Park* Source: Google maps street view, 2011.	275
55.1d	Title: *Wiggins Park* Source: Google maps street view, 2011.	275
55.2	Title: *Distribution of "Social Community Infrastructure" within the Urban South-East Sector* Source: Drawn by author.	277

Fig. No.	Title/Source	Page
55.2a	Title: *Nutana Collegiate* Source: Saskatoon Public Schools. "Nutana Collegiate" Retrieved from: http://class.spsd.sk.ca/index.aspx?section=schools&page=NCI, 2011.	277
55.2b	Title: *St. James Anglican Church and Spirit Center* Source: Jordon Cooper on Flickr.com. Retrieved from: http://www.flickr.com/photos/jordoncooper/94755322/sizes/l/in/set-72057594058310281/, 2009.	277
55.2c	Title: *Adelle House* Source: Google maps street view, 2011.	277
55.3	Title: *Distribution of Commercial Areas within the Urban South-East Sector* Source: Drawn by author.	279
55.3a	Title: *Broadway Avenue* Source: Photo by author, May 2008.	279
55.3b	Title: *8th Street East* Source: Henry James on Panoramio.com. Retrieved from: http://static.panoramio.com/photos/original/5234980.jpg, 2009.	279
55.3c	Title: *Avalon Shopping Center* Source: Yoshi Hashimoto, on request by author, summer 2009.	279
55.4	Title: *Distribution of Residential Areas within the Urban South-East Sector* Source: Drawn by author.	281
55.4a	Title: *4th Street East between Melrose and Victoria Ave.* Source: Google maps street view, 2011.	281

Fig. No.	Title/Source	Page
55.4b	Title: *8th Street East between Dufferin and Broadway Ave.* Source: Google maps street view, 2011.	281
55.4c	Title: *Edmund Heights Housing Development* Source: Google maps street view, 2011.	281
55.4d	Title: *"Scott" and "Forget" Towers at Mceown Ave. and Louise St.* Source: Google maps street view, 2011.	281

Introduction

An Unsustainable Agriculture

"That we should have an agriculture based as much on petroleum as on the soil - that we need petroleum exactly as much as we need food and must have it before we can eat - may seem absurd. It is absurd. It is nevertheless true." - Wendell Berry

Like nearly everything else in the world today, the way we produce, process, distribute and even consume food in many cases, is dependant upon the availability of cheap fossil fuels. From the diesel fuel used to cultivate the land, plant the seeds, and harvest the crop; to the hydro-carbon based chemicals used to both fertilize our plants and keep them free from pests; studies estimate that it now takes the equivalent of 1,000 liters of oil to produce food from a single hectare of land in North America. (Springbett 2008) And that's just production.

Taking into account the fuels used in processing, distributing and consuming these foods, studies show that the U.S. food system (of which Canada is comparable) is currently running an energy deficit of 10:1. That is, it currently takes 10 kilocalories of energy (90 percent of which are fossil fuels) to deliver a single kilocalorie of food energy. (Pfeiffer 2006, 12) Expressed in other terms, the equivalent of 400 gallons of oil are required annually to feed a single North American citizen. (Pfeiffer 2006, 8) Not only is this extremely inefficient, but as we reach the end of cheap oil, it is completely unsustainable.

Experts predict that by 2016 at the very latest, and as early as within the next two or three years, global energy availability will begin an "inexorable downward trend." (Heinberg 2004, 36) While some claim that it will possible to switch to alternative sources, Pfeiffer points out that there is no other energy resource – "not renewables, not unconventional resources such as tar sands, not even coal" capable of delivering as much energy as hydrocarbons. He goes on to say that the impact of fossil fuel depletion will not only be felt at the pumps, but the dinner table as well, resulting in "higher food prices and, if nothing is done to completely revamp our food system, sooner or later in food shortages and massive starvation." (Pfeiffer 2006, 35). Fortunately for all of us, something *is* being done.

An Emerging Alternative

"Shortening the links between farmers and consumers may in fact be the most strategic and enjoyable way to bring about fundamental change for the better. A world in which everyone is well fed with local, fresh foods would be a world where everyone has more power, community and contact with nature." - Helena Norberg-Hodge, Todd Merrifield, Steven Gorelick.

In the last forty years, the number of Farmers' Markets across North America has increased dramatically – from a few hundred in the 1970s to over 7,000 today. (Halweil 2004, 111) Likewise, the number of Community Supported Agriculture Programs (CSAs) on the continent has grown from only 2 in 1986 to over 13,000 today. (McFadden 2011) And in a similar fashion, we have seen an explosion in the number of "farm to fork" restaurants, urban food buying clubs, and 100-mile markets across the continent.

Around the world, producers and consumers alike are realizing that by reconnecting with each other directly, not only is it possible to build food systems that are far less dependant on fossil fuels, but since this re-connection makes economically viable for producers, methods of small-scale diverse agriculture, it is also possible to contribute to the rebuilding of the ecological and cultural resources upon which we will all be dependant for the production of our foodstuffs in a world of diminished fossil fuel resources - fertile soil, healthy ecosystems, and a generation of farmers interested in returning to the land in order to produce food in a safe, healthy and secure way.

And although these initiatives currently account for only a very small portion of all the food being consumed in North America today (3 percent by some estimates – Kingsolver 2008, 32) it is believed that with government support, and/or policy change (to favour local sustainable production over green revolution-type agriculture as it currently does), the possibility is there for local, sustainable systems to take over a much greater portion of the food market – providing both food security to urban populations, while developing a scenario which makes it viable for those wanting to, to return to the land supported by sustainable rural communities.

A Proposal for the Prairies

This thesis investigates the possibility of such a system for Saskatoon, Saskatchewan and its 150 km rural hinterland. Located in the heart of the Canadian Prairies, both the city and its surrounding rural communities have been dependant upon the capital-intensive long-distance industrial food system for both economic vitality and the majority of its foodstuffs for over 70 years, and unfortunately, it has taken its toll. Fertile soils have been transformed into "sponges into which we must pour hydrocarbon based fertilizers to produce crops" (Pfeiffer 2006, 12), while native grasslands have been degraded and fragmented to the point that many can no longer support wild species vital to maintaining ecosystem health. (IISD 2011)

At the same time, the replacement of labour on the farm with ever-increasingly large fossil-fuel driven equipment has resulted in a decades-old out-migration of workers, leaving dozens of towns and hamlets abandoned, and hundreds more struggling to maintain essential services. And in addition to this, the migration of global grocery chains from inner-city areas to more affluent suburban areas has created "food deserts" - that is, large areas of the city (and rural area alike) where fresh, affordable, foodstuffs are currently unavailable for many. (Saskatoon Community Clinic 2008)

Fortunately, a growing number of initiatives both within the city and its surrounding rural area are proving that this doesn't have to be the case: small-scale livestock, fruit, vegetable and dairy producers are emerging, while the number of farmers' markets, "farm to fork" restaurants, food box programs and on-farm stores continues to rise. Together, producers and consumers are proving that not only is small-scale diverse agricultural production possible and able to contribute to the building of vibrant rural communities on the Prairies, but since this food can be distributed on a much smaller scale, and can easily be set up in communities throughout the city and rural area, has the ability to make a significant contribution to the reduction of food deserts in both areas as well.

Role of the City/Rural Municipality

Unfortunately however, like everywhere else in the industrialized world, despite a growing interest *in*, as well as growing capacity *of* these systems, they still only account for a very small percentage of the food being distributed in and around Saskatoon today. Recent figures show that even during the growing season, the province is only 7 percent self-sufficient in fresh vegetables. (Agriculture and Agri-food Canada 2007).

Although policy makers and health professionals alike are making inroads in developing programs and establishing initiatives that help both producers and consumers increase their capacity to either grow, produce, buy, or consume these foods, in Saskatoon as well as in nearby rural communities, private business and capital enterprise still shape *how*, and as a result, to a large degree *what* we all eat, while any local food initiatives that do come to fruition are the result of grass-roots efforts driven by producers and consumer themselves, without any help from (and in some cases even hindered by - i.e. with policies that favor big box retail over smaller initiatives) the city or rural municipality of which they are a part.

However, this thesis proposes that just as cities and rural municipalities take an active role in developing the water, electrical and transportation infrastructure of their respective built environments, they too have the opportunity, and indeed obligation to plan for, design, and build sustainable food systems for all communities.

Goals of the Thesis

That being said, it is recognized that unlike a water, electrical, or transportation system a local food system cannot just be planned and implemented overnight. But rather there is a significant amount of capacity building that must be done on both the side of producer as well as consumer before a local food system not only on the Prairies, but anywhere in the world, would be able to provide the majority of foodstuffs a community requires.

And so, by developing a local food system for the city of Saskatoon and its surrounding hinterland, that has the ability to produce, process, and distribute 80 percent of the foodstuffs required by the community, this thesis will attempt to do several things:

1) present in a very visual, very accessible way just how much capacity would be required in order for such a system to be able to provide some degree of food security for both rural and urban communities on the Prairies,

2) develop a very viable, economically reasonable, and easily executable framework upon which this capacity could be built; and

3) illustrate the ability of such systems to contribute to the building of socially prosperous rural and urban communities alike.

Layout of the Thesis

In order to do this, the thesis has been divided into five chapters.

Entitled *A 150 km Foodshed for Saskatoon*, the first chapter simply introduces the framework in which the proposal is set, discusses restrictions on the proposal, and develops a smaller, more reasonable case study area to be used for the remainder of the thesis.

Chapter Two then, introduces and briefly discusses four elements deemed to be crucial in developing a comprehensive local food system on the Prairies: small-scale natural-systems-based production; decentralized, small-scale processing and preserving; direct producer-to-consumer distribution; and facilities that propagate a new cuisine.

Utilizing the elements from Chapter Two together with the case study area identified in Chapter One, Chapter Three then outlines a system of production, processing, distribution and community support for the South-East Sector of the city. Dependant upon a reciprocal capacity-building relationship between one rural and one urban community, this chapter also defines and identifies a case study area of each to which the system will then be applied in the final two chapters of the thesis.

Chapter Four then, applies the system as outlined to the town of Craik and its surrounding 15 km hinterland; while the fifth and final chapter does the same for the urban case study area of Holliston Park and its surrounding urban community.

Although not crucial to understanding the main premise or trajectory of the thesis, also included is a fairly extensive appendix which includes a great deal background information regarding both the geographical context as well as several of the agricultural models used within the thesis itself.

Chapter One

The Framework:

A 150 km Foodshed for Saskatoon

Chapter contents:

1.1 A 150 km Foodshed for Saskatoon 8

1.2 Six Self-sufficient Sectors 14

1.3 Rural Portion of the South-East Sector 18

1.4 Urban Portion of the South-East Sector 20

1.1 A 150 km Foodshed for Saskatoon

Defining "Local" as 150 km

Depending upon one's location in the world, the guideline distance used to define "local" varies. Locavores (i.e. those dedicated to eating "local" food) in California, for instance, commonly cite a 50 mile (80 km) radius as their guideline, while for those in Alaska a much larger area of 150 miles (240 km) is more common. In the case of Saskatchewan, a 150 km radius seems to make sense for a number of reasons.



"...a 100-mile radius is large enough to reach beyond a big city and small enough to feel truly local."

- Alisa Smith and J.B. MacKinnon, co-creators of the "100-mile diet" concept.

First of all, it coincides with the popular "100 mile diet" concept, which is becoming more and more familiar to many of us. For, as Alisa Smith and J.B. MacKinnon note, this distance is both large enough to cover a significant amount of land and growing conditions, while at the same time remaining small enough to allow for the intimate re-connection of people and places crucial to building such systems.

In addition to this, a 150 km radius seems to makes sense based upon the geographic and demographic characteristics of the province as well. For as Figures 1.1 and 1.3 illustrate, if both Regina and Saskatoon - the two largest cities in the province - developed a 150 km foodshed, not only would a significant portion of the province's most fertile lands (Dark Brown and Black Soil zones) be included, but a good portion (44 percent) of the province's rural population* would also be included.

---

* Figures calculated by author based on 1996 Statistics Canada figures combined with graphics of the source map for Figure 1.3 (see list of figures).

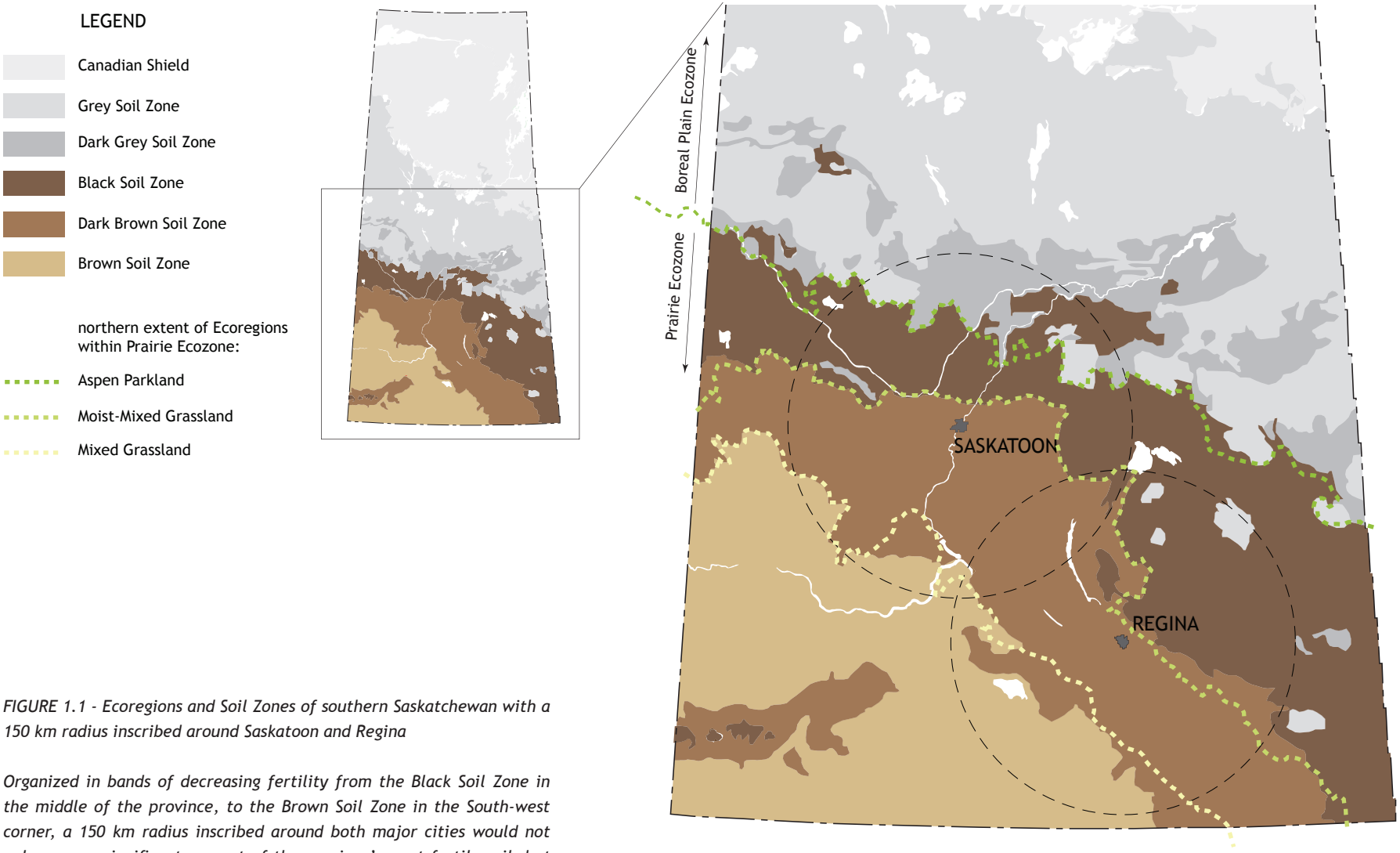


FIGURE 1.1 - Ecoregions and Soil Zones of southern Saskatchewan with a 150 km radius inscribed around Saskatoon and Regina

Organized in bands of decreasing fertility from the Black Soil Zone in the middle of the province, to the Brown Soil Zone in the South-west corner, a 150 km radius inscribed around both major cities would not only cover a significant amount of the province's most fertile soil, but the province's most productive ecoregions (Moist Mixed Grassland and the Aspen Parkland) as well.



Figure 1.2 - A 150 km Foodshed for Saskatoon

A 150 km Foodshed for Saskatoon

And so, this thesis will investigate the possibility of developing a food system (of production, processing, distribution, and community support) for the city of Saskatoon that will draw the majority of its resources from a distance no greater than 150 km. As discussed earlier, not only will this drastically reduce the "footprint" left by Saskatonian's meals on the planet, but it may also contribute to the economic, social and environmental health of rural communities within the said area, as well as reintroduce all parties to the natural cycles and limitations of the place upon which we all ultimately rely for all things.

It is worth noting that either Saskatoon or Regina could have been chosen as the area of investigation for this thesis. As a result of the author's familiarity with a greater number of local food initiatives in Saskatoon however, it has been chosen over Regina. It is assumed however, that being of very similar size, climate and cultural condition, either city could act as a model for the other, or even scaled back in order to shed some light on the type of system appropriate for smaller centers in the province as well.

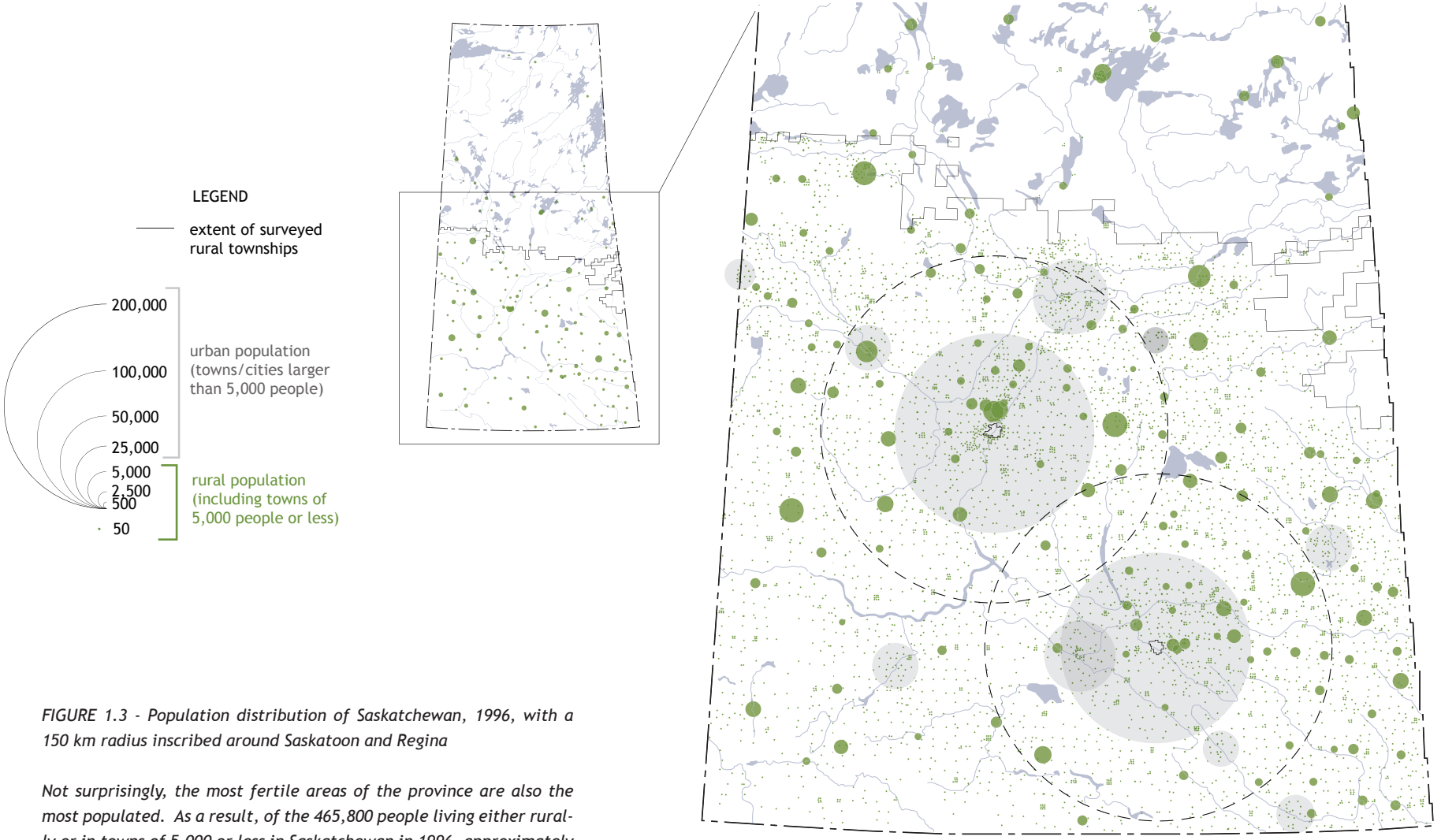


FIGURE 1.3 - Population distribution of Saskatchewan, 1996, with a 150 km radius inscribed around Saskatoon and Regina

Not surprisingly, the most fertile areas of the province are also the most populated. As a result, of the 465,800 people living either rurally or in towns of 5,000 or less in Saskatchewan in 1996, approximately 206,400 of these - 44 percent - live within 150 km of either Saskatoon or Regina.

Exceptions

Recognizing that it is unrealistic to propose that Saskatonian residents give up all exotic foods now common in their diets, this thesis is proposing that 80 percent of the community's foodstuffs come from local sources.

While local food gurus have stated that it is not unreasonable to expect that 50 percent of a typical Saskatonian diet can be fulfilled from the province's resources (Ehman 2008), as Figure 1.4 illustrates, after excluding only the foodstuffs that cannot easily be grown or raised in the Saskatchewan context (i.e. fish*, sugar and tropical fruit), 81 percent of the total food requirements of a typical Canadian (as per Statistics Canada 2006) still remain.

Thus, this will be the goal here - to develop a system that will be able to deliver approximately 80 percent of the foodstuffs required by a Saskatonian diet locally, with imports of exotics making up the other 20 percent.

* at least one farm in the area is experimenting with aquaculture in the area, so although this has not been incorporated as part of the scope of this thesis, it is possible that someday even the province's fish consumption may be accommodated locally.

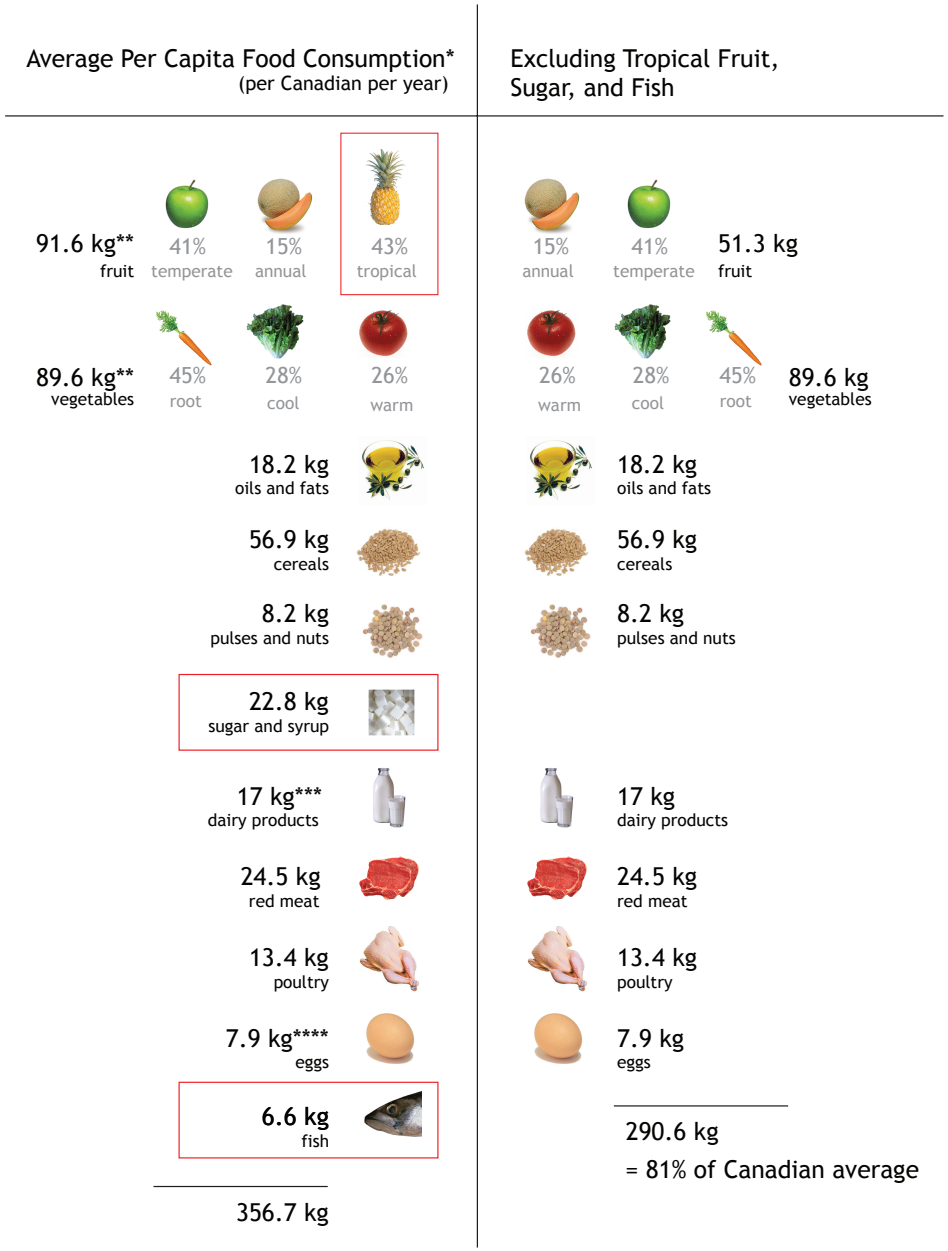


Figure 1.4 - Average Canadian Per Capita Food Consumption

After excluding from the "Average per capita Food Consumption in Canada" the foodstuffs that cannot easily be grown or raised in Saskatchewan's climate - tropical fruit, sugar, and fish - 81 percent of total food consumption still remains.

* as per Statistics Canada, 2006.
** fresh equivalent
*** eqivlanet to approximately 170 litres of fluid milk
**** approx. mass of 11.5 doz eggs

1.2 Six Self-sufficient Sectors

While some areas of this 150 km radius may be more ideally suited to some types of food production than others (e.g. the wetter, more temperate area to the northeast of the city for dairy production, or the area on west slopes of the North Saskatchewan River for fruit production), by utilizing small-scale natural-systems-based production in combination with natural as well as man-made microclimate conditions, it seems quite possible that all dietary staples previously mentioned can be produced with relative success throughout the entire area. Thus, in order to limit the scale and scope of the geographical area with which this proposal is dealing, the entire foodshed (including the city itself) has been divided into six sectors, with each sector being required to produce (process, distribute and preserve) enough food to feed itself (excluding the 20 percent exotic foodstuffs) throughout the year.

Defined by Transportation "Spines" in the Rural Area

Relatively evenly spaced and radiating from the city in all directions, major transportation routes have been used as "spines" around which such sectors could come to be defined in the rural area.

In addition to connecting even the outermost producers of this 150 km area as efficiently as possible to the rest of the sector, as well as to the city center; such arteries are also typically home to more and larger towns than more remote areas (as the increased traffic provides much needed economic and social support) - making them not only a reasonable *physical*, but also *psychological* heart of this larger rural area as well.

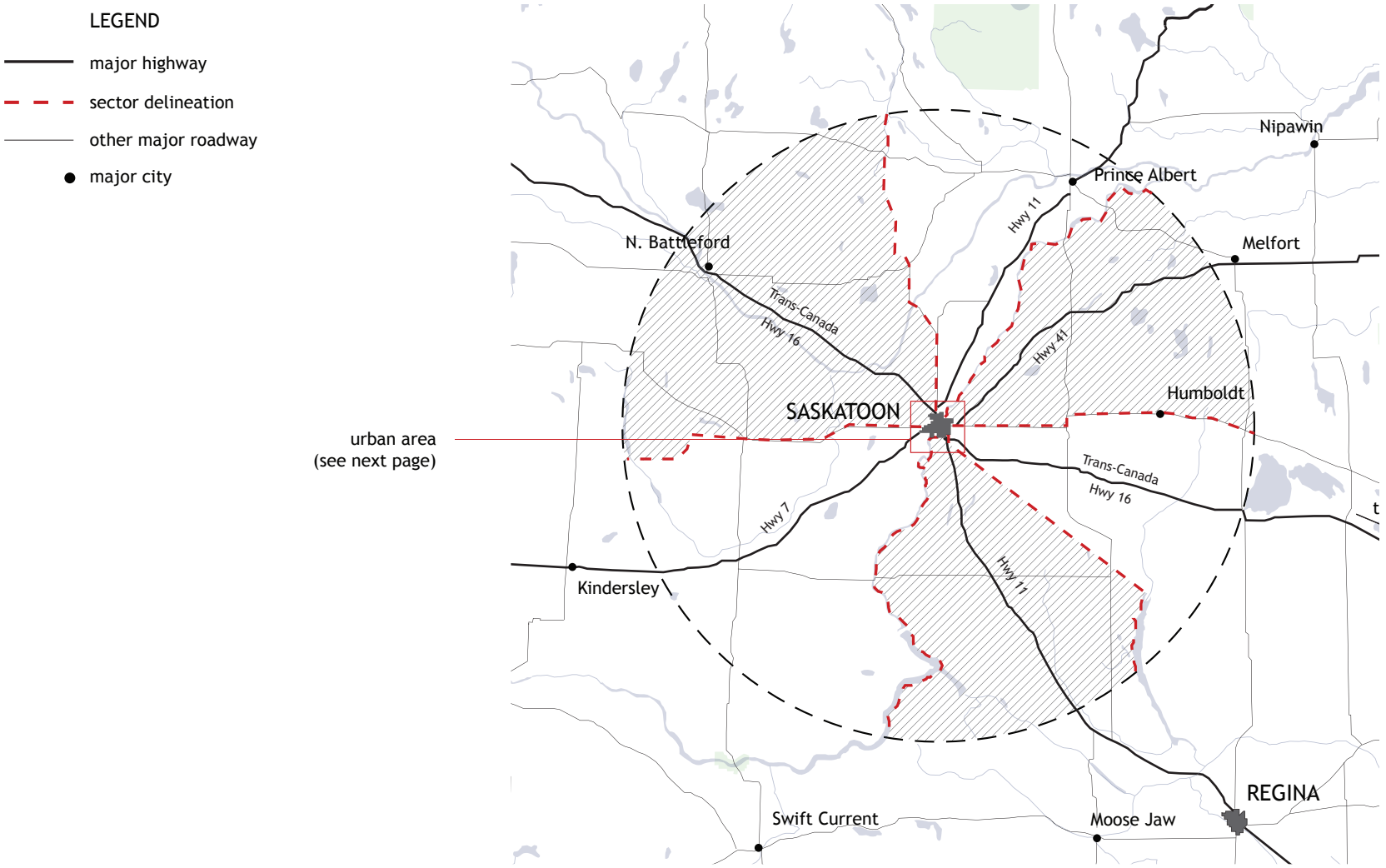


FIGURE 1.5 - Sector Delineation within the Rural Portion of the Foodshed

Major transportation routes act as "spines" around which six roughly similarly-sized sectors have been defined within in the rural portion of Saskatoon's 150 km foodshed.

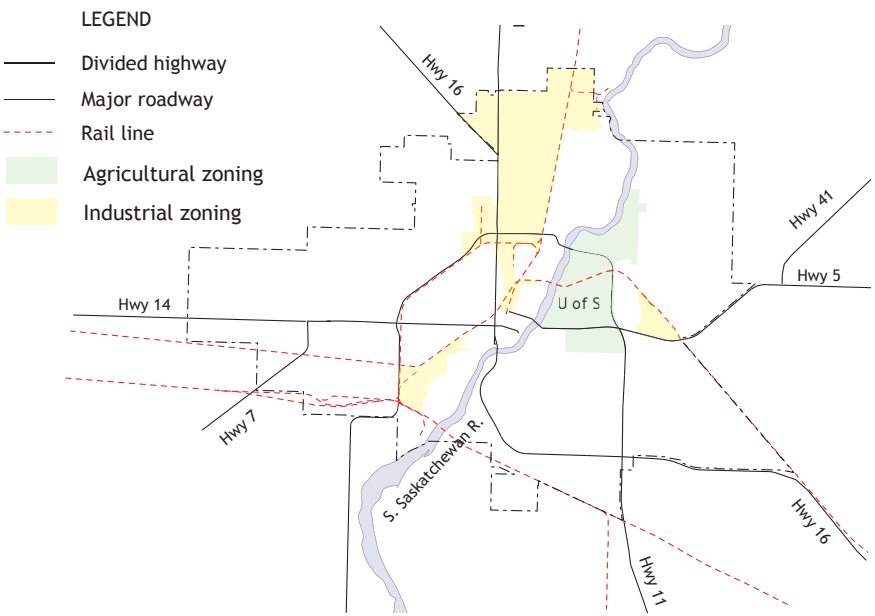


FIGURE 1.6 - Major Physical Barriers within the Urban Portion of the Foodshed

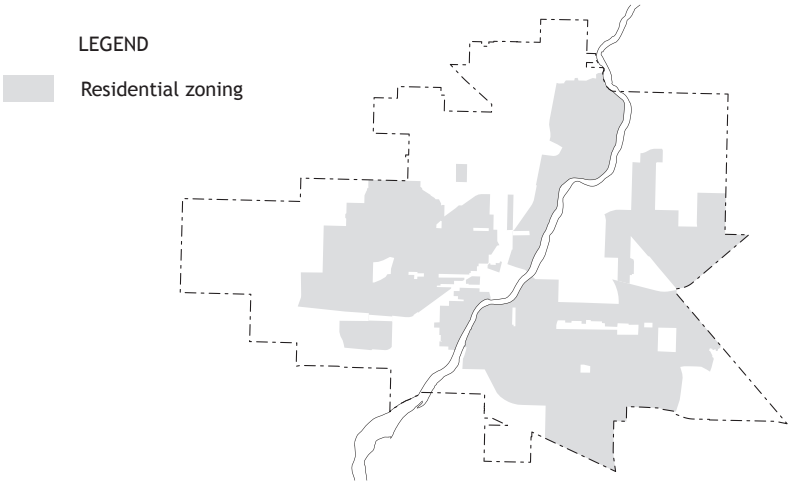


FIGURE 1.7 - Extent of Residential Zoning within the Urban Portion of the Foodshed

Defined by Gaps within The Residential Fabric in the Urban Area

In the urban area however, these transportation routes along with other major infrastructural pieces of the built fabric (e.g. railways, industrial corridors, the South Saskatchewan River, and the University of Saskatchewan Lands - see Figure 1.6) typically create barriers that actually divide major residential areas (see Figure 1.7) from each other.

This, combined with the attempt to delineate sectors of roughly equivalent consumption capacity (i.e. containing the same number of people) and distribution opportunities (i.e. including a cross-section of demographics as well as building density patterns) has resulted in the delineation of six urban sectors as shown in Figure 1.8.

A Case Study Sector

While any one of these urban sectors (together with its rural counterpart) could have been chosen as a case study area, the South-East Sector has been selected simply because it seems to present an average case - the rural portion of the sector having neither the worst nor best agricultural capacity, while the urban area having neither the wealthiest nor poorest population as well as a variety of residential densities. The following section briefly introduces both.

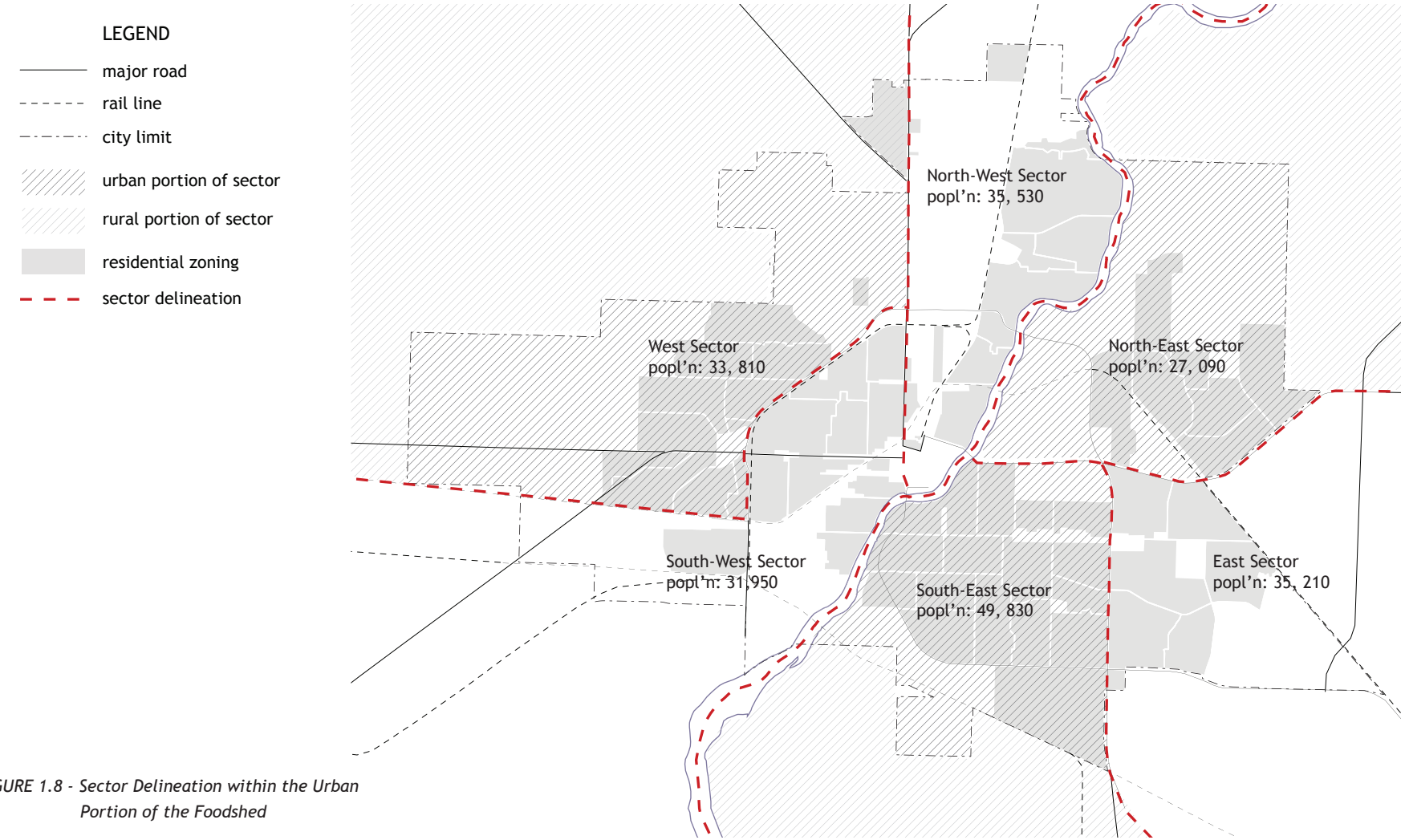


FIGURE 1.8 - Sector Delineation within the Urban Portion of the Foodshed

Combined with population densities and overall population figures (as per Statistics Canada, 2006), gaps within the residential fabric have been used to delineate sectors of roughly equivalent consumption capacity and distribution opportunities within the urban context.

1.3 Rural Portion of the South-East Sector

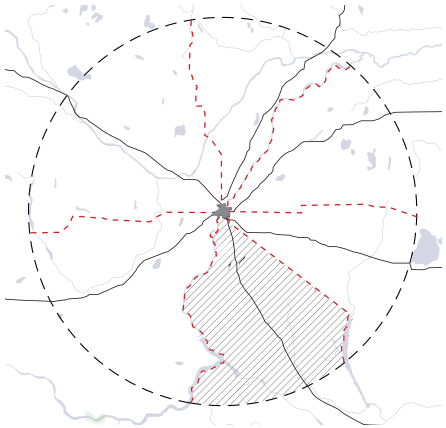


Figure 1.9 - Key plan, Rural Portion of the South-East Sector

Like nearly everywhere else in province, the ever-increasing scale of agriculture has been reducing the rural as well as small-town population within this area for decades. Of the 25 settlements within the sector, only two have been able to retain populations of close to 1,000 or more, seven have populations between 650 and 250, 14 have between 125 and 25 people, while 3 have even less than that. Even so, combined with a rural population of 3,500 people*, the sector is home to approximately 10,000 people.

In addition to this, the sector is also home to many initiatives that are challenging the notion of business as usual on the Prairies as well. Projects such as the Back to the Farm Research Foundation, the Craik Sustainable Living Project, the Grainland Community Pasture, as well as the Saskatchewan Irrigation Diversification Center, illustrate that not only is there a group of people in the area interested in alternative methods of agriculture and lifestyle on the Prairies, but they are proving it is viable. (See Appendix Four for a full description of each.)

And although some residents have claimed that the area has seen some major increases in farm sizes as of late, historically, the area has fared relatively well when compared to the rest of the province (and foodshed even) in terms of farm consolidation. And so, although there are other areas around Saskatoon with slightly better soil and growing conditions (e.g. to the north east of the city), the South-East Sector appeared to present an average/ideal case.

---

* based on the average population density of 0.3 persons/km^2 as reported by Statistics Canada, 2006

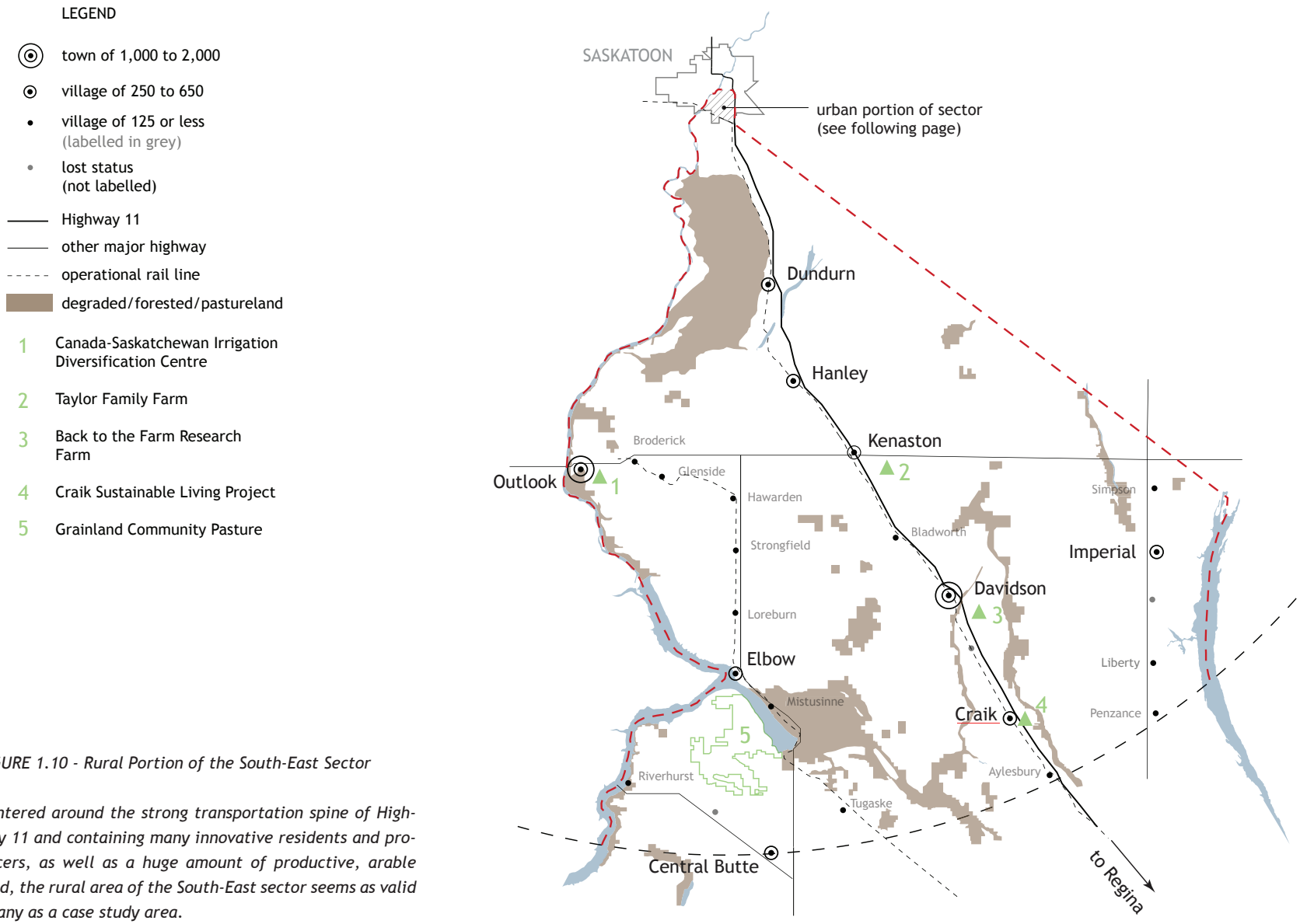


FIGURE 1.10 - Rural Portion of the South-East Sector

Centered around the strong transportation spine of Highway 11 and containing many innovative residents and producers, as well as a huge amount of productive, arable land, the rural area of the South-East sector seems as valid as any as a case study area.

1.4 Urban Portion of the South-East Sector

Bordered on the west by the South Saskatchewan River, and on the north and east by Highway 16, the urban portion of the South-East Sector is the largest of all those delineated, with approximately 49, 830 people.

Except for small pockets of retail, institutional and recreational facilities scattered throughout (as well as several larger agricultural and industrial areas at its borders), the majority of the sector is in fact residential. With densities ranging from about 9.0* to 13.9 persons per acre, the population is fairly evenly distributed throughout the sector as a whole, and with a very limited amount of housing being anything besides detached single family dwellings, this population is typically very evenly distributed throughout neighbourhoods as well. There are several exceptions to this, however.

As the city's original town site, Nutana (and its Broadway Ave. heart in particular) has retained some of its density as well as mixed used character and is currently a mecca of culture and "community" within the city; while the big box commercial strip along 8th street east, and the shopping mall development within the Nutana Suburban Center, leave substantial holes within the otherwise fairly uniform residential fabric.

---

* although the Exhibition neighbourhood is reported as having a population density of 6.87 this is the result of a significant potion of the neighbourhood being occupied by the exhibition grounds, and therefore not a very accurate representation of the true residential density of the area.

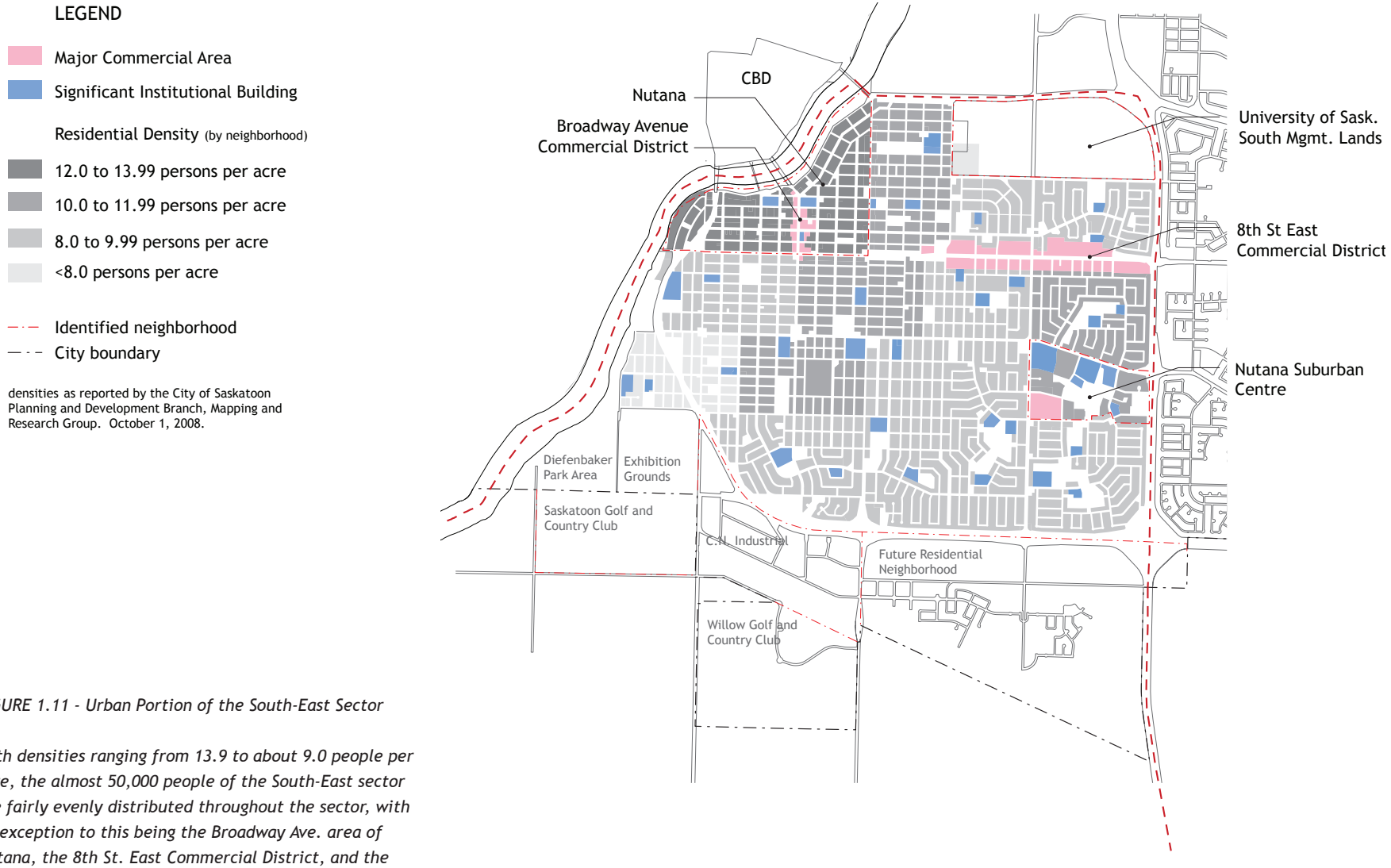


FIGURE 1.11 - Urban Portion of the South-East Sector

With densities ranging from 13.9 to about 9.0 people per acre, the almost 50,000 people of the South-East sector are fairly evenly distributed throughout the sector, with an exception to this being the Broadway Ave. area of Nutana, the 8th St. East Commercial District, and the Nutana Suburban Center.

Chapter Two

The Elements:

A Study of Types for the South-East Sector

Although the most recognizable element of many local food systems is an alternative form of distribution (e.g. farmer's markets or co-op grocery stores), an alternative means of production, of processing and preserving, as well as even consuming food will be required in order to build comprehensive local systems capable of providing a significant amount of our daily food requirements year-round.

Thus, the following section introduces four elements:

1) Small-Scale Natural-Systems-Based Production,
2) Decentralized, Small-Scale Processing and Preserving
3) Direct Producer-to-Consumer Distribution, and
4) Facilities that Propagate a New Cuisine;

and then identifies several different "types" (defined by the author based on a study of national and international models) of each, that, depending upon the producer, consumer, and type of foodstuff involved, could all play a unique, and necessary role in the building of a sustainable local food system for the South-East Sector.

Chapter contents:

2.1 Small-scale Natural-systems Based Production 25

2.2 Decentralized Small-scale Processing and Preserving 35

2.3 Direct Producer-to-Consumer Distribution 41

2.4 Facilities that Propagate a New Cuisine 47

2.1 Small-scale Natural-systems-Based Production

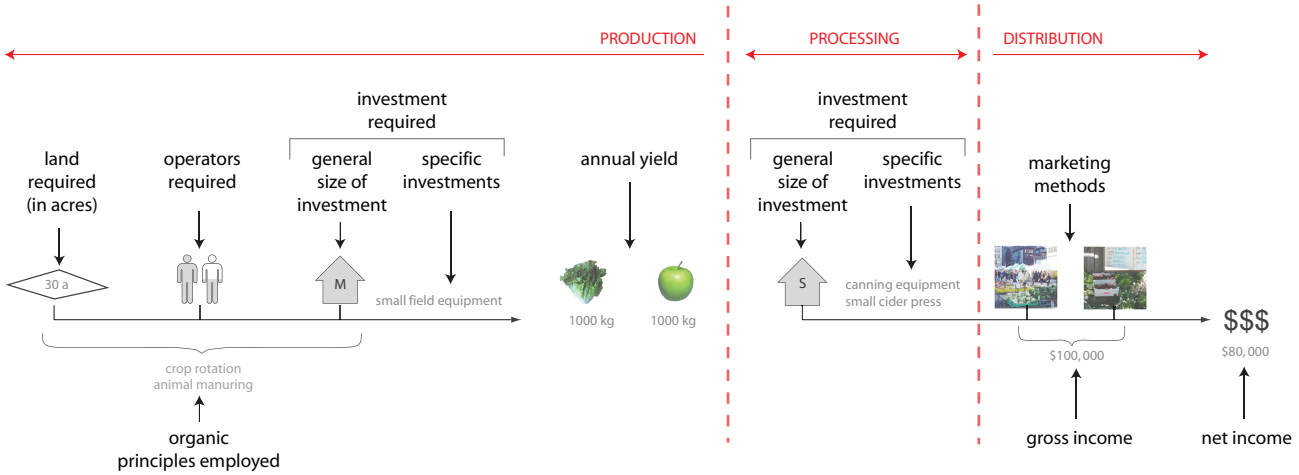
"Mother earth never attempts to farm without livestock; she always raises mixed crops; great pains are taken to preserve the soil and to prevent erosion; the mixed vegetable and animal wastes are converted into humus; there is no waste; the processes of growth and the processes of decay balance one another; ample provision is made to maintain large reserves of fertility; the greatest care is taken to store the rainfall; both plants and animals are left to protect themselves from disease." - Sir Albert Howard

Utilizing "beyond organic" methods (i.e. going beyond a form of production that just excludes the use of pesticides and fertilizers, but seeks to remodel our agricultural systems on nature as Sir Albert Howard describes - see adjacent quote), small-scale natural-systems-based production has the ability to not only contribute to the overall environmental sustainability of our food system; but since it is practiced on a small scale using a wide diversity of plants and/or animals, has the ability to produce both the diversity and quality of foodstuffs necessary for farmers to sell direct to producers - a crucial element in building more stable, secure food systems, as well as systems that are economically viable as well culturally rewarding for the producer as well.

There currently exists thousands of working North American farms that could act as models of such production for the Canadian Prairies. The following study identifies seven of these, such that when taken together and applied to the Saskatchewan context, would be able to provide a significant diversity of foodstuffs in all of the food categories previously identified.

It is worth noting that besides environmental sustainability, all seven of the following models do exhibit some degree of economic sustainability as well. This was an important quality in selecting models, for a major challenge for small-scale producers today is figuring out how to make such systems economically viable. And so, in order to illustrate how this was achieved on each farm, a "system diagram" has been included alongside the description of each farm, illustrating not only the methods used to *produce*, but also *process* (if necessary) and *distribute* foods in order to achieve an agricultural system that is not only environmentally sound but economically sustainable as well.

System Diagram Key



System Diagram Legend

type of food produced

- cool-weather vegetables
- root vegetables
- warm-weather vegetables
- annual fruit
- temperate fruit
- sugar and syrup*
- grains and cereals
- pulses
- red meat
- poultry
- eggs
- dairy

* although not one of the primary food types this thesis is investigating, because it is a minor product of another system, the category of "sugar and syrup" is present in one of the following system diagrams.

marketing methods

- farmers' market
- on-farm store
- local restaurant
- CSA program
- local grocery
- metropolitan food buying club

size of investment required

- XS - extra small
- S - small
- M - medium
- L - large
- XL - extra large

net income earned

- $ $0 - 24,999/yr
- $$ $25,000 - 49,999/yr
- $$$ $50,000 - 99,999/yr
- $$$$ $100,000 +/yr

capacity of operators

- full-time
- part-time

FIGURE 2.1

Wally's Urban Market Garden
Saskatoon, Saskatchewan



From only half an acre of otherwise unused urban land, Wally Satzewich and Gail Vandersteen have developed a system of sub-acre urban farming that can yield over 7,000 kg of fresh vegetables, and net $50,000/year - all within the short 110-day growing season of Saskatoon. (Satzewich and Christensen 2005b)*

** author's approximation, see Appendix Two and Three.*

Small-Plot Intensive Vegetable Production

For centuries, backyard gardeners have demonstrated that vegetable production on a small-scale utilizing simple organic techniques, has the ability to not only produce large volumes of exceptionally high quality food products, but since it can be practiced on otherwise unused urban acreage has the potential to provide significant environmental benefits as well. For the contemporary farmer however, there exists significant challenges in making such systems economically viable. Taking on that challenge, Wally Satzewich and partner Gail Vandersteen have developed a system of sub-acre urban farming that can yield over 7,000 kg* of fresh vegetables from only half an acre of land, even within the short growing season of Saskatoon.

Called "SPIN"® (Small Plot IN-tensive) farming, their system champions the use of relay plantings of fast-growing, high-value crops in order to maximize outputs and returns, while crop rotation, manual labour and companion planting minimize necessary inputs. Orchestrated such that a good diversity of fresh vegetables are available for sale from early June to mid September, the Satzewich's estimate a gross income of $54,000/yr., while very few operating costs and expenses can leave up to $50,000 of that as income. (See Appendix Two and Three for further details and diagrams.)

System Diagram

of *Wally's Urban Market Garden*:

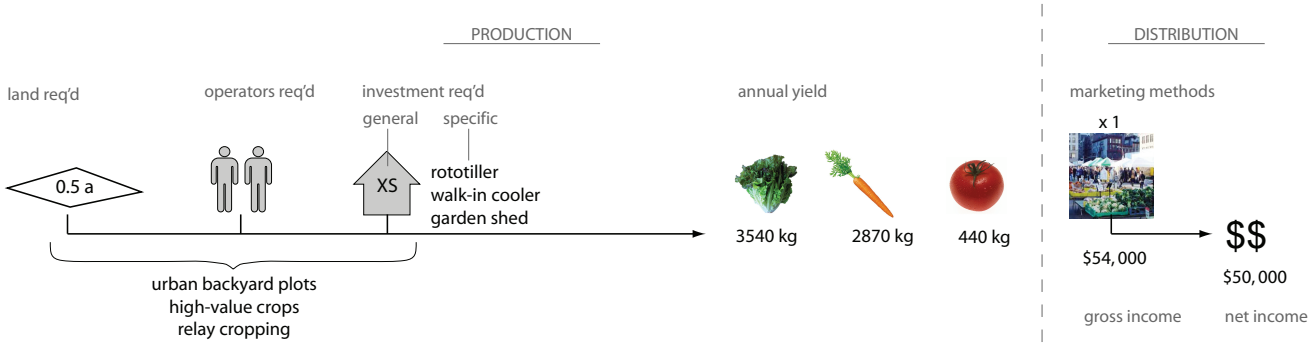


FIGURE 2.2

Four Season Farm
Harborside, Maine



By combining simple crop protection systems with succession plantings of cold-hardy vegetables, and "deep" organic principles, Eliot Coleman and Barbara Damrosch have developed "an environmentally sound, resource efficient and economically viable system for extending fresh vegetable production into 'the other eight months'" (Coleman 1998, front flap) on his Four Season Farm in Harborside Maine.

**author's estimate, see Appendix Two and Three.*

Protected Intensive Vegetable Production

While the in-season production of vegetables using methods such as those developed by the Satzewich's is an essential starting point, in order to make local food systems viable year-round (especially in a climate such as Saskatchewan's), it is essential "to be able to continue supplying 'fresh' food throughout the winter months." (Coleman 1998, ii) And so, taking cues from historic European example, Eliot Coleman has devised a system of greenhouse production which extends the spring and fall growing seasons far enough that he is actually able to harvest fresh vegetables from his market garden in Harborside, Maine all winter long without any additional heat.

Using a "double crop protection system" combined with succession plantings of specifically selected cold-hardy vegetables as well as an elaborate crop rotation system, Eliot along with his wife Barbara are able to harvest 7,700 kg* of fresh vegetables from their 1.5 acre *Four Season Farm* every year. Sold exclusively on the "backside of the calendar" the Colemans' system not only provides residents with fresh locally produced vegetables throughout the bleakest winter months, but by grossing $100,000 US/yr., establishes an economically rewarding agricultural system for the small producer as well. (See Appendix Two and Three for further details and diagrams.)

System Diagram

of Eliot Coleman's *Four-Season Farm:*

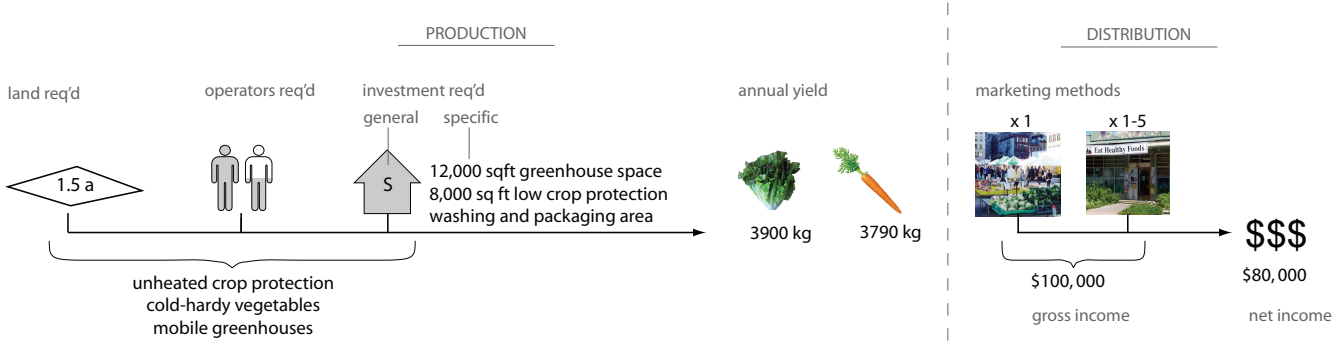


FIGURE 2.3

Meeting Place Organic Farm
Lucknow, Ontario



The integration of fruit and animal production on Tony and Fran McQuail's Meeting Place Organic Farm in southern Ontario not only maximizes the production capacity of a limited land base, but allows the mechanisms that exist in natural ecosystems "to reestablish themselves" (McQuail 2008) in order to create a healthy orchard ecosystem that is able to bear fruit without the barrage of toxic sprays typically necessary on monoculture fruit farms.

**the Phillipses also run Heartsong Farms Healing Herbs and a construction company, while the McQuails raise livestock and have a vegetable CSA.*

Integrated Holistic Fruit and Animal Production

Throughout the course of this research several farms utilizing small-scale sustainable fruit production methods were investigated: in northern New Hampshire, Michael Phillips uses holistic methods to minimize the need for sprays and eliminate the need for synthetic fertilizers in his young orchard of 300 apple trees; while in southern Ontario, Fran and Tony McQuail utilize species stacking in their small orchard (sheep rotationally graze an orchard understory of grass and broad leaf weeds) in order to eliminate sprays and allow the orchard to "reestablish [the natural] balances" (McQuail 2008) that keep both disease and pests in check.

In both cases however, fruit production only accounts for a small portion of the farm's production capacity and income.* Thus, in order to understand what kind of system would be required for "Integrated Holistic Fruit and Animal Production" on the Prairies, a model has been developed by combining the base concepts of these farms together with information sourced from *The Apple Grower: A guide for the Organic Orchardist*, as well as the opportunities presented by recent research at the University of Saskatchewan regarding cold-hardy fruit cultivars. (See Appendix Two and Three for further details and diagrams.)

System Diagram

of the developed farm model:

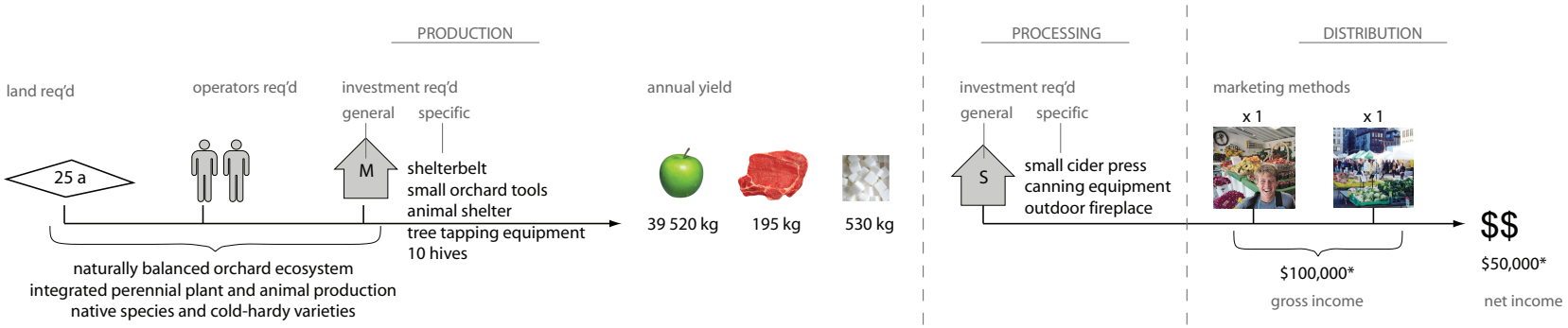


FIGURE 2.4

Windborne Farms,
Scott Valley, California.



Scaled "to the environment and an appropriate aesthetic" (Ableman 2005, 44) as well as to her own personal ability, Jennifer Greene's 30-acre Windborne Farms "exemplifies a sustainable model of farming - and this means sustainability 'in terms of a whole society, not just the land.'" (Renz 2006)

**author's calculation based on various online sources, circa 2008.*

Small-scale Diverse Grains and Cereals Production

By limiting her scale to 30 acres, and planting an amazing diversity of cereal grains, spring legumes and dried beans, Jennifer Greene is proving that small-scale grain production too, can not only be environmentally and economically sound, but since it allows the farmer to transform industrial agriculture's ultimate commodity (wheat) into a whole, real, place-specific, nourishing food, such methods of production can be spiritually rewarding as well.

Allowing her to utilize animal traction and small "community-scaled" equipment, Greene's scale keeps her overhead low, while the rotation of "ten families of crops and fifty six different cereal varieties" (Ableman 2005, 42) together with animal manuring maintains fertility. Such diversity as well as the on-site processing of much of the 15,000 lbs of heirloom grains, beans and seeds she harvests every year into flour, cornmeal, pancake and cereal mixes, allows Greene to sell direct to customers through her 90-member CSA. With extremely low overhead costs and living expenses, Greene is able to make a profit of $2.00/lb, and live comfortably on her overall profits of $30,000 US/yr.*

System Diagram

of Jennifer Greene's *Windborne Farms:*

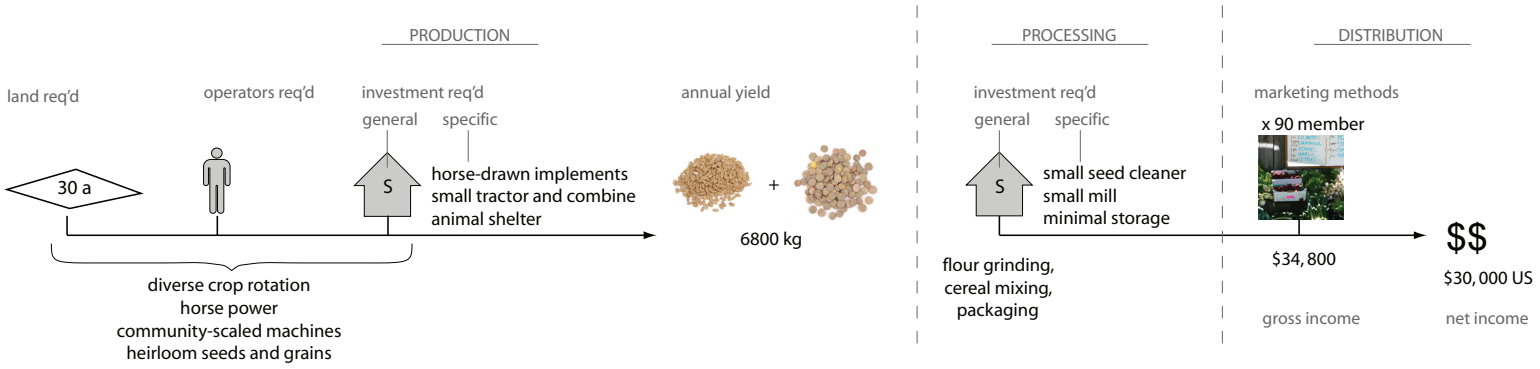
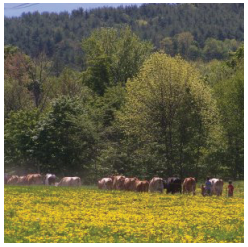


FIGURE 2.5

RockBottom Farm with Strafford Organic Creamery Strafford, Vermont.



Committed to "sustainable agriculture and dairy without compromises" (Strafford Organic Creamery 2011) Earl Ransom and his wife Amy Huyffer have developed a one-farm, one-family dairy in central Vermont that not only produces "the best milk and ice cream on the planet" (ibid) but provides Earl with enough income to continue farming the land as his father did - organically - with a closed-loop system of pasture, livestock and feed crops maintaining the fertility of the soil, the health of the animals, and the economic vitality of his pocket book.

Closed-loop Dairy Production

Similarly to Greene, Earl Ransom and his wife Amy Huyffer have proven that a by keeping a herd small and focusing on *quality* rather than *quantity* of milk, a closed-loop system of pasture, livestock and feed crops - once typical on dairy farms throughout North America - can once again become possible. Besides reducing off-farm inputs and maintaining the fertility of the land in an environmentally-sound way, such a system allows the milk produced by the Ransom's 50-head herd of Guerneys to be unique - flavored by the plants, soils, smells, and seasons of the land from which it came.

Pasteurized and bottled (as well as processed into eggnog, ice-cream, table cream and whipping cream) directly on the farm with small-scale creamery equipment imported from Israel, the Ransoms are able to sell their milk directly to local grocery and natural food stores under their own label, where as testament to its quality and freshness, it sells for three times that of regular commodity milk – providing Earl with enough income to continue farming as his father did, while producing what some believe to be "the best milk and ice-cream on the planet." (Strafford Organic Creamery 2011)

System Diagram

of Earl Ransom's *RockBottom Farm and Organic Creamery:*

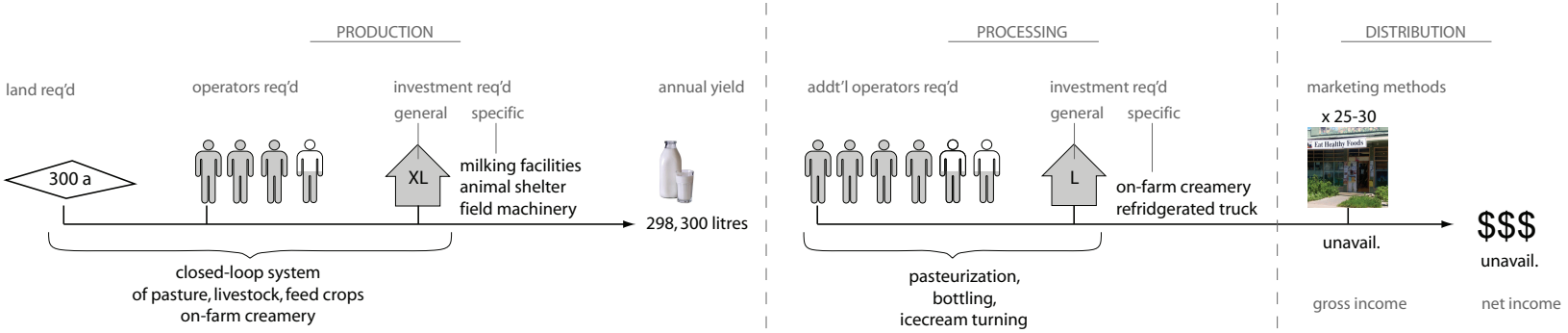


FIGURE 2.6

Polyface Farms Inc.
Shenandoah Valley, Virginia



By seeing and managing their 100 acres of pasture, 450 acres of woodlot, and thousands of chickens, hens, rabbits, cattle, pigs and turkeys as "a single [integrated] biological piece," (Pollan 2006, 224) and not simply as a pork, poultry or beef machine, three generations of Salatins have developed an "emotionally, economically and environmentally enhancing agricultural enterprise" (Polyface 2011) in Virginia's Shenandoah Valley.

Natural-systems Mixed Livestock Production

While the inclusion of meat (and other animal products) in a sustainable food system may appear controversial to some, as farmers such as Joel Salatin have proven, by mimicking on a small scale the grazing patterns and species relationships found in nature, not only is it possible to build livestock-producing agricultural systems that are resource efficient, environmentally sound, and economically viable, *but* since the system allows animals to "do what they have naturally evolved to do" delivers happy, healthy animals, the by-product of which is amazing tasting meat and animal products.

Utilizing species "stacking" and a labour-intensive method of animal rotation, Joel Salatin together with 9 other full-time workers and only 100 acres of pasture, is able to produce 30,000 dozen eggs, 10,000 broilers, 800 stewing hens, 50 beeves, 250 hogs, 1,000 turkeys, and 500 rabbits every year. (Pollan 2006, 222) While small livestock (all poultry and rabbits) are slaughtered directly on the farm, because of government regulations all beeves and pork must be sent off-site for processing. Sold from as many as 60 local venues, *Polyface* is able to gross close to 1 million dollars a year. However taking into account considerable operating costs as well as the large number of employees, a figure close to $50 or $75,000/person/yr. may be achievable.

System Diagram

of Joel Salatin's *Polyface Farms, Inc:*

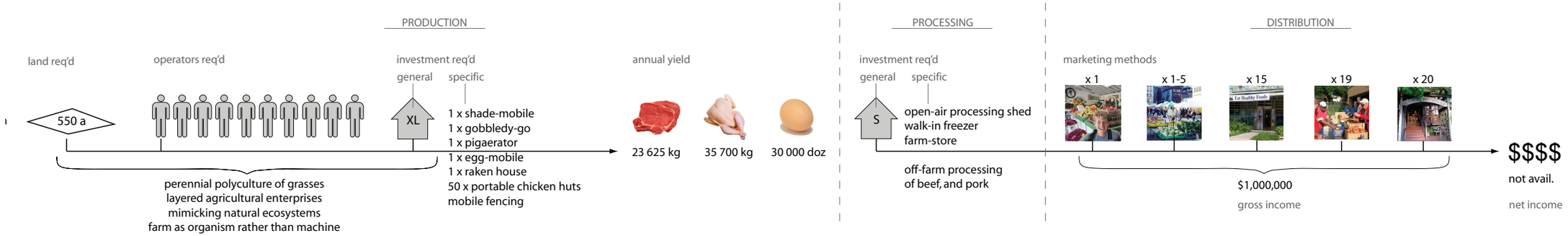


FIGURE 2.7

Sagehill Buffalo Ranch
Cudworth, Saskatchewan



On Josef Saxinger's Sagehill Buffalo Ranch, 700 bison graze native grasses in a "mob and move" strategy, similar to their natural patterns, building not only healthy animals and a healthy ecosystem, but an efficient agricultural system as well. (Saxinger 2008)

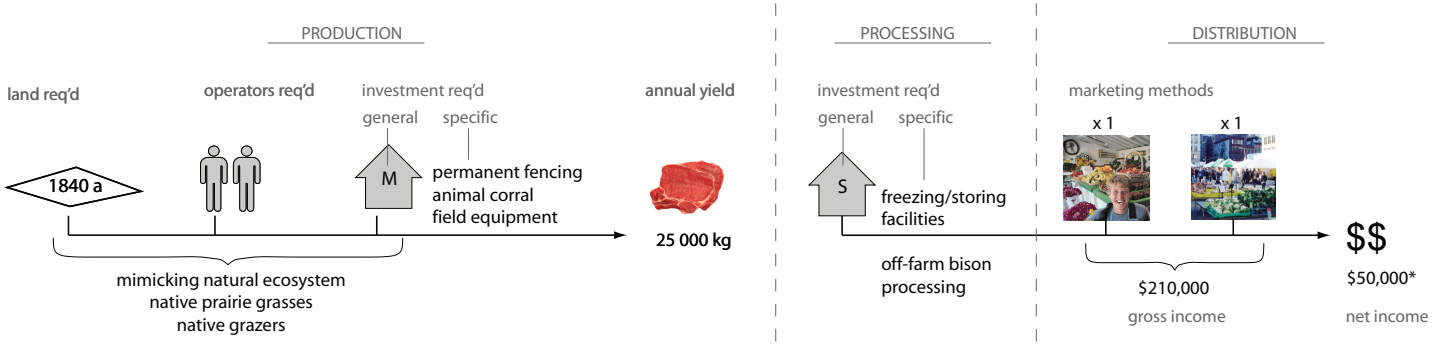
Natural-systems Bison Production

In addition to small-scale dairy and mixed livestock production, bison ranching also provides an extremely viable opportunity for sustainable livestock production on the Prairies as well. Having evolved alongside the flora and fauna of the native grassland ecosystem, when grazed in a "mob and move" strategy that mimics their natural grazing pattern not only are animals kept happy and healthy, but the integrity of the native ecosystem is also maintained - even restored in some cases - providing habitat for many wild species at the same time as providing a productive agricultural system.

On 1,840 acres in southern Saskatchewan, Josef Saxinger together with the help of one full-time employee is able to keep 700 head of bison in this way. Slaughtering approximately 100 head every year, and selling the meat at the Saskatoon Farmers' Market as well as through an on-farm store, Josef is able gross over $200,000/yr.. And although significant infrastructure costs (e.g. butchering, fencing, mechanical corral equipment) take some of this, approximately $50,000/yr. is left as income for both himself and one full-time employee. (Saxinger 2008)

System Diagram

of Josef Saxinger's *Sagehill Buffalo Ranch:*



2.2 Decentralized, Small-scale Processing and Preserving

"Before I can sell my neighbor a T-bone steak I have to wrap it up in a million dollars' worth of quintuple-permitted processing plant," however, "transparency is a more powerful disinfectant than any regulation or technology." - Joel Salatin, as quoted by Michael Pollan.

As illustrated in the descriptions and "systems diagrams" of many of the previously investigated production systems, small-scale processing is an essential part of keeping many small farms both economically and socially viable. As Salatin notes, "local canneries, little sawmills and backyard butchers build thriving, bustling rural townships and villages. It will take the same infrastructure to bring them back." (Salatin 1998, 35)

Unfortunately, government regulations (ironically put in place to try and ensure the safety of food coming out of large industrial facilities) in conjunction with the continuing consolidation of the food system are making it increasingly difficult to process foodstuffs at the scale of the single farmer, group of farmers, or even the small community level, even though in many cases this has been proven to produce cleaner, healthier, and better quality food products than that which is coming out of big processing plants.

The following study briefly identifies four different types of small-scale processing, that are either still allowed *despite* these regulations, or are newly emerging *out of* these regulations that will be required if local systems are to be able to provide more than just menial part of a typical Saskatonian's diet.

FIGURE 2.8

Open-air Livestock Killing Shed, Polyface Farms Inc., VA



Open not only to the "best disinfectant in the world - fresh air and sunshine" (Pollan 2006, 229) but also the watchful eyes of any interested consumers, 300 chickens are killed, scalded, plucked and eviscerated six times a month throughout the summer, in this open-air processing shed on Joel Salatin's Polyface Farms.

On-farm Processing

Although limited by quotas and strict government regulations, many products can be processed directly on the farm with relatively inexpensive, easy-to-source equipment. This is true of small livestock, fruits and vegetables, as well as grains and cereals. Not only does this allow the farmer to capture the full economic benefit of value-added products, but it also contributes to the environmental sustainability of the system as well, as offal (in the case of livestock slaughter specifically) remains on site as part of the farm's ecological cycle. At the same time consumers also benefit, for as Pollan notes that the transparency delivered by such systems provide "a more powerful disinfectant than any regulation or technology." (Pollan 2006, 235)

In many cases however, government regulations have made it such that it is either illegal or completely unfeasible for the single farmer to process foodstuffs directly on the farm with small inexpensive equipment. In this case, it is possible that either "Mobile Shared Processing", or "Community-based Rural Centre Processing" could provide feasible alternatives.

FIGURE 2.9

Gate to Plate Food Services Inc.
Fort St. John, BC



One of only several mobile abattoirs in operation throughout the country, "Gate to Plate Food Services" out of Fort St. John, BC., travels from farm to farm, providing an affordable, federally-licensed "kill and chill" service for up to 10 large or 20 small animals per day. (Canadian Farm Business Management Council 2007)

Mobile Shared Processing

Owned either independently, or jointly between a group of farmers, mobile processing facilities can operate at the scale and accommodate the diversity required by many small producers, while complying with the typically expensive, federally-inspected equipment (and sometimes even supervision) required in order process some foods intended for sale beyond the farm gate.

In the case of large animal slaughter for example, mobile "kill and chill" services such as the one pictured in Figure 2.9 are beginning to fill the gap left as small provincially inspected abattoirs are forced out of business. Outfitted with federally-licensed equipment and personnel, these retrofitted eighteen-wheelers travel from farm to farm providing on-farm slaughtering services for approximately 10 large animals/day. Besides providing affordable services capable of handling the diversity required by small-scale producers, such initiatives are also contributing significantly to the safety and stability of the entire food chain, as it helps to decentralize large animal slaughter - one of the most consolidated, most unclean and most precarious parts of our food system today. (Morrigan 2005)

FIGURE 2.10

Dairy Processing Kitchen, Swatsworth Foundation near Munich, Germany



At the Swatsworth Foundation near Munich Germany, several dairy farmers and community members alike have pooled resources to purchase equipment needed to pasteurize milk, turn butter, and solidify cream cheese. Prepared by community members, for community members as well as distributed through direct sales at the farm gate and through a CSA, enough money is made to keep the farmers in business, while supporting the building of a truly local cuisine. (Russell, 1998)

Community-Shared Rural Center Processing

Historically, processing that required expensive equipment, specific knowledge, or larger quantities of raw product than any one farmer could supply, (e.g. milk pasteurization and cheese making, large animal slaughter, fruit and vegetable canning) was accomplished at the scale of the local community. Providing employment for local residents as well as processing opportunities that could be tailored to the specific needs of both local producers and consumers, such facilities not only contributed significantly to the economic vitality of rural communities, but also provided the foundation for the building of local, regional cuisines as well.

Although processing at this scale has typically become unfeasible as a result of government regulations and consolidation of the food chain, around the world communities are proving that by establishing such facilities as co-operatives - involving farmers, processors, and consumers - not only is it possible to avoid some of the regulations forcing small independently-owned processors out of business, but since it allows for the reconnection of producers and consumers directly has the ability to contribute to the rebuilding of culinary traditions unique to the combination of plants, animals, and people from which this food is coming as well.

FIGURE 2.11

Wild Fire Organic Bakery & Cafe
Victoria, BC.



With a single location in Victoria, B.C., and the mandate to source healthy ingredients as locally as possible, Wild Fire Organic Bakery not only "create[s] the finest quality food" (Wild Fire Organic Bakery & Cafe 2011) but has encouraged the establishment of several small grain farms in the area, at least one of which now grows and supplies Red Fife Wheat - a recently revived ancient wheat grain recognized by Slow Food International for its value to agricultural diversity - to small bakeries across the province. (Zdybel 2008)

Artisan (secondary) Processing

It is not always feasible (or desirable for that matter), for producers or groups of producers to tackle the processing of raw foodstuffs to a "ready to eat" stage, however. Some processes (bread-making for example) are an art in themselves, and to tackle both occupations (i.e. farmer and baker) would be difficult at best.

In this case, independent bakers, butchers, restaurateurs even, become an important element in building a local food system, as they operate at a scale that allows them to utilize diverse agricultural products from small producers; while also having the passion, experience and skills necessary to create unique, beautifully crafted and amazing tasting products - not only creating consumer awareness of, but also increasing demand for, even more locally produced products and flavours, helping to build the capacity of the system as a whole, significantly.

3.3 Direct Producer-to-Consumer Distribution

"Shortening the links between farmers and consumers may in fact be the most strategic and enjoyable way to bring about fundamental change for the better. A world in which everyone is well fed with local, fresh foods would be a world where everyone has more power, community and contact with nature." - Helena Norberg-Hodge, Todd Merrifield, Steven Gorelick.

While shops and markets that provide the opportunity for direct (or near direct) distribution are as old as North American cities themselves, until relatively recently the viability of such institutions has been dwindling, due to a variety of factors not the least of which is the rise of the grocery store model, and the continuing consolidation of the food system in general.

Unfortunately however, such institutions are a key element not only in making small-scale sustainable agriculture economically viable and culturally rewarding for the producer (allowing him or her to keep the full share of the consumer food dollar, while being re-established as the consumer's representative on the land rather than simply a cog in the wheel of industrial agriculture); but since it reconnects all of us (many of whom have been disconnected from the land for generations) in a very direct way to the nature of the land and what is required to grow food on that land in a safe and healthy way, such institutions have the ability to foster a renewed interest in, and potentially even spur action regarding, further lifestyle changes in order to safeguard the resources of this planet upon which we all ultimately rely on for survival.

Fortunately, as more and more of us become interested in getting closer to the sources of our food and those who grow it, traditional as well as new means of direct producer-to-consumer distribution are emerging. The following study identifies six of these that, when taken together could provide a variety of opportunities for the direct distribution of foodstuffs both within the city of Saskatoon as well as its surrounding rural hinterland.

FIGURE 2.12

Granville Island Market
Vancouver, BC



Established only 40 years ago, in 90,000 sq. ft. of previously abandoned, yet historically important industrial buildings, Granville Island's Public Market, not only brings together over 150 producers, artisans and food purveyors with thousands of residents, chefs, tourists and "foodies" from across the city every day in a vibrant, colorful and enjoyable environment, but as the catalyst for a larger, extremely successful urban redevelopment project, that draws over 10 million visitors a year, it has been recognized internationally for "adding significantly to the social, economic and environmental well-being" of its host city, Vancouver, as a whole. (Gardner 2010)

Central Public Markets

Open on a daily basis, and offering an amazing selection of fresh fruits, vegetables, herbs, red meat, fish, and baked goods year-round, the central public market is the form of direct (or near direct) distribution most similar to the grocery store model which with we are all so familiar, while at the same time offering an unimaginably pleasing environment in which to get closer to the origins of one's food. Attracting residents, chefs, tourists, and other "foodies" from across the city, such central markets can act as stepping stones - re-introducing a city's population, to the joys, excitement, benefits, etc. of buying fresh, whole food from independent retailers. At the same time, locating such institutions in dense urban areas on sites or in buildings of particular historic or cultural significance can help to reestablish the important cultural and civic role that food distribution once held in North American cities – potentially increasing the viability of less convenient, however even more direct forms.

FIGURE 2.13

Dufferin Grove, Farmers' Market
Toronto, ON



From 3-7 pm every Thursday, close to 30 local farmers come together in a busy corner of Dufferin Grove Park in Toronto, Ontario, to establish the "Dufferin Grove Organic Farmers' Market." First established in 2002 by community members, several local farmers and park personnel, the market is an endeavor established by the community, for the community (Friends of Dufferin Grove Park 2011) - not unlike almost 30 other independent farmers' markets currently operating at a similar scale and frequency throughout the city. (Toronto Community Garden Network 2011)

Neighbourhood Farmers' Markets

Typically defined temporally as a gathering of tents, tables, trucks and carts in parks, parking lots, vacant lots, or even dedicated buildings, neighbourhood farmers' markets are the most prolific, and potentially fastest growing means of direct distribution in large cities today.

Ranging in size from 10 to 100 vendors, and operating either weekly, bi-weekly, or in some cases even three times a week throughout the growing season, open-air, local-only farmers' markets have the ability to not only significantly improve the accessibility of local, in-season food throughout large cities in a way that is economical and flexible for the city; but since they serve a smaller, more immediate community than large central markets, can provide community building opportunities not only between producer and consumer community, but also within the urban community itself - by providing the locus necessary to bring together like-minded individuals.

FIGURE 2.14

Seasonal Roadside Stand
Vicki's Veggies, Picton, ON



Open every day all season long, a roadside stand on Vicki Emlaw's small-scale vegetable farm not only supplements the income from a CSA and several Farmers' Markets, but in combination with an up-to-date website, word of mouth and well-advertised farm events, the on-farm stand acts as a gateway for local residents to visit the farm - getting to know in a fuller way the place and people that make up "Vicki's Veggies". (Vicki's Veggies 2011)

Seasonal Farm Stands

As simple as a table at the farm-gate with an honor payment system, or as elaborate as a fully enclosed building with daily hours and full-time supervision, roadside stands can increase the distribution opportunities for small-scale fruit and vegetable producers with very minimal investment or labour, while providing consumers that are willing to seek them out with the freshest food possible. Located in close proximity to the city or along major transportation routes, such stands could become a weekly or even daily stop for commuters, while grouped together and combined with u-pick opportunities, farm tours, tasting events, etc., such stands can act as gateway for consumers to participate in a fuller way with the people and places from which their food comes.

FIGURE 2.15

Year-round Farm Store
Pine View Farms, Osler, SK.



Located only 20 minutes north of Saskatoon, the on-farm store on Kevin and Melanie Boldt's Pine View Farms not only acts as a convenient pick-up point for on-line or in-person orders, but by teaming up with a beef, lamb, pork and rabbit "partner producer" and holding regular hours five days a week, the on-farm store becomes a feasible destination for city-dwellers interested in sourcing their animal products directly from the farm. (Pine View Farms)

Year-round On-Farm Stores/Sales

For farmers selling animal products or other produce that stores reasonably well (such as apples, root vegetables, seeds and grains, etc.), year-round on-farm stores become quite feasible. Selling produce from a single farm exclusively, or teaming up with other nearby similarly-minded producers such stores don't need to be open daily - but since many of these products are typically bought in bulk, pre-ordered even, being open for several hours of several days every week is sufficient in order to accommodate customers that are typically seeking them out specifically. In combination with on-farm processing, such stores can provide real transparency between producer and consumer – ensuring the consumer of clean, safe food, which in many cases leads to a greater "contract" between producer and consumer (i.e. the consumer placing an order for quarter or even half an animal) which helps the farmer immensely.

FIGURE 2.16

Online Directory
Local Harvest, USA



By describing and locating close to 20,000 small farms, farmers' markets, restaurants, co-ops, and grocery stores in the USA alone, localharvest.org is helping to connect thousands of consumers, producers, and distributors of local food all over the country, 24 hours a day, 7 days a week. (Local Harvest 2011)

Online Directories

While not a physical piece of food distribution infrastructure itself, online directories are becoming an important tool in helping the more remote - and potentially more rewarding - forms of direct distribution (such as farm stands and on-farm stores) to be become more feasible. By simply locating the place one lives, the desired radius of travel and the type of food interested in sourcing, it becomes easy to not only locate, but also read about production methods, principles, etc. of local farmers that are selling direct - helping to connect like-minded producers and consumers that may have never had the opportunity otherwise.

FIGURE 2.17

Fairview Gardens CSA Program
Goleta, CA



Every week 250 families visit this stand at Fairview Gardens in Goleta, CA. to pick up their "share" of the harvest. Consisting of about 8 different fruits and vegetables (depending on the season) and costing $20/week (with a minimum commitment of 14 weeks), this not only provides the farm with some assured income, it also presents the opportunity for consumers to visit the farm, and learn not only what sustainably grown food tastes, smells and looks like, but also what is required to make that possible. (Fairview Gardens CSA 2011)

Farm Share Programs

This includes CSA (community supported agriculture) Programs and any other arrangement where the consumer pays the farmer in advance for a certain "share" of the farm's anticipated harvest. This is most typically done by the "box" – where customers pay for a certain number of weekly food deliveries (either picked up from the farm, a central pick-up point, or even delivered right to peoples' homes) of fresh fruits and vegetables, the selection of which is standard, based on whatever produce is ready for harvest in any particular week.

While such programs have significant benefits for both producer and consumer (i.e. provides farmer with assured income early in the season when they need it the most, while providing consumers with opportunity to get food as fresh as it can be, directly from the farm, cheaper than if they were to buy it from a farmers' market every week), for some, the variety of goods presented through such programs can be a considerable challenge. In the words of one ex-CSA member, "the veggies were too weird ... some people no doubt love purple potatoes, mystery greens and guess-a-squash as a staple. … We weren't expecting this. We won't be participating next year." (Ostrom 2007, 111) For others however, perhaps with more culinary experience or interest in relearning a new cuisine, however, this can be seen as an exciting opportunity – to discover anew every week "the wonderful surprises offered up by the soil." (Ostrom 2007, 111).

"The main barrier standing between ourselves and a local-food culture is not price, but attitude. The most difficult requirements are patience and a pinch of restraint - virtues that are hardly the property of the wealthy."
- Barbara Kingsolver

2.4 Facilities that Propagate a new Cuisine

While it is possible that taken together, the elements of small scale natural-systems-based production, decentralized processing, and direct distribution previously investigated can deliver a diet of healthy, nutritious foodstuffs to the majority of urban residents, until we, as a society, relearn how to preserve, cook and truly enjoy local foods once again - not just as a menial addition to our diets, but as the foundation of a new year-round cuisine - we will be unable to build a local food system of the capacity and robustness that some predict will be required in the very near future.

Thus, the following study investigates facilities and/or programs that could play a role in helping a population build the capacity of this system not only on the production end, but also on the consumption end, by increasing consumers' ability to cook, preserve, store and (hopefully) enjoy local, in-season food in order that the system can flourish before it becomes an absolute necessity.

FIGURE 2.18

Community Seed Bank
Mina Honda, Honduras



Included in such "resource centers," community seed banks, like this one in Mina Honda, Honduras, (USC Canada 2007) could play a significant role in building the capacity of sustainable food production on the Prairies by re-establishing a local, secure supply of quality, unpatented, genetically-diverse seed.

Rural Resource Centers

Not unlike the Dominion Experimental Farms established over a hundred years ago in order to investigate and then demonstrate to new farmers the most effective farming methods, seeds, animal breeds, etc. of the region, (Manitoba Historical Society 2009) it is imagined that "rural resource centers" dispersed throughout the 150 km radius, could provide aspiring small-scale diverse farmers of today with the research and extension services they require to begin making the transition to more sustainable methods.

Including things such as a resource library (both online and hard-copy), demonstration plots, and community seed saving programs, such facilities would not only be a storehouse of information regarding sustainable methods from around the globe, but by applying, adjusting or otherwise experimenting with such methods in a local context, such facilities can become living laboratories as well – an invaluable resource in building the capacity not only of local producers who can visit and learn from the farm first hand, but by making reports and results available online, such "living laboratories" can become an important resource in building capacity throughout the entire foodshed.

FIGURE 2.19

The Center for Urban Agriculture at Fairview Gardens, Goleta, CA.

Supplying fruits and vegetables to over 500 suburban families throughout the year, Fairview Gardens is not only a model of sustainable small scale agriculture, but hosting guided tours, workshops, volunteer opportunities, as well as cultural and music events - provides thousands of local school children, youth, and adults alike the opportunity to reconnect with the land and what it means to grow food sustainably on that land, in a way that would not be possible if the farm was not surrounded by "tract homes, shopping malls, and suburban thoroughfares." (Center for Urban Agriculture 2011)



Urban Farm Learning Centers

Any small farm that hosts on-farm events, offers a CSA, or otherwise encourages consumers to come out the farm, plays an important role in building the capacity of local food consumption by first of all educating consumers as to what sustainable food production is all about. However, as cities continue to grow outward, there exists the opportunity to not gobble up every available inch of land, but to hold some of this as farmland in order to develop "urban farm learning centers."

Not unlike the 12.5 acre Fairview Gardens "surrounded on all sides by tract homes, shopping malls, and suburban thoroughfares," (Center for Urban Agriculture 2011) these learning centers would not be simply demonstration plots or academic research areas, but working, small-scale, diverse farms, selling real food to real people in order to keep the farm viable. Not only would such endeavours reconnect an immediately adjacent urban population to the land - some of whom may have been isolated from it for generations, but in hosting food preservation seminars, workshops, volunteer opportunities, even cultural festivals and events, such farms could be instrumental in building the capacity of consumers to not only cook and enjoy local foods, but come to see sustainable food production as a necessary piece of any urban lifestyle, and support small farms and farmers (whether located within the city's boundaries or not) with as many of their food choices as they are able.



FIGURE 2.20

City Park Community Garden
Saskatoon, SK.

In addition to providing growing space for over 40 gardeners, the City Park Community Garden in Saskatoon, Saskatchewan, hosts potlucks, organizes talks by experts, and even puts on small festivals throughout the summer months - bringing together experienced as well as inexperienced gardeners of the community to not only grow fresh vegetables in a rewarding way, but when taken all together, begin the process of building a new food culture based on a truly local cuisine. (City Park Community Garden 2011)

Community/Allotment Gardens

Located within large public parks, along railway tracks, or any other available publicly-owned urban land, community gardens can provide a place for those without their own land (or knowledge of how to garden on their own), to come and grow fresh vegetables. While the limited scale of these gardens typically prevent them from becoming a substantial food source for many families, such plots can provide the opportunity for those who may not have otherwise been interested, to not only experience what fresh, healthy food tastes like and what it takes to grow it, but by bringing together diverse members of the community to share seeds, tools, experiences, and even recipes; rekindle in some the desire to further this connection with real food, and begin growing, cooking, and preserving foods in a way that begins to shift one's reliance to local over global food.



FIGURE 2.21

Community Canning Center
Citrus County, Florida

A newly refurbished canning center in Citrus County, Florida provides not only the equipment necessary for local residents to preserve fresh fruits and vegetables for their personal use, but supported by the county's Parks and Recreation department, is (by appointment only) able to provide full-time supervision of the process as well (Board of County Commissioners, Citrus County, Florida 2009) - a key element in helping many learn the skills necessary to be able to turn the enjoyment of fresh, local foods into a year-round cuisine.

Community Kitchens

For communities in cold climates, food preservation becomes a crucial step in being able to translate this enjoyment of fresh, local, in-season foods into a year-round cuisine. Home canning presents a significant opportunity in this case, however for those of us lacking the knowledge, the kitchen space, or the economic means to buy the required equipment, this presents significant challenges. Community kitchens offer the opportunity to can, freeze, dry or otherwise preserve foodstuffs either bought in bulk, or grown in one's backyard, in a cost effective, yet also enjoyable way - as quite often such activities, not unlike work days in communal gardens, become neighbourhood-wide events bringing together friends, family and neighbours to share not only resources and knowledge, but also "community".

FIGURE 2.22

Neighbourhood Root Cellar
EcoVillage at Ithaca, Ithaca, NY.

Designed by students from nearby Cornell University, and built in 2007 by EcoVillage residents themselves, (EcoVillage at Ithaca 2011) this earth-burmed root cellar at EcoVillage at Ithaca provides residents with storage for root vegetables as well as canned fruits and vegetables throughout the winter months - helping many ensure that their CSA bounties last all year long.



Community Storage

For many urban residents, a lack of suitable storage space makes it difficult to buy or grow large quantities of root vegetables that have traditionally been stored and eaten all winter long in cold climates (e.g. potatoes, carrots, and squash). Community storage facilities such as root cellars, freezers, drying racks, etc., could help many in dense urban areas or in communal living arrangements, to expand significantly the viability of developing a cuisine that incorporates local foods not only in peak season, but all year-round.

FIGURE 2.23

The Edible Schoolyard
Martin Luther King, Jr. Middle School
Berkeley, California

With the stated mission "to create and sustain an organic garden and landscape that is wholly integrated into the school's curriculum, culture, and food program," (The Edible Schoolyard Berkeley 2011) the one-acre garden and kitchen classroom at Martin Luther King, Jr. Middle School is not only reconnecting children to the land and what it takes to grow, harvest, and prepare local, fresh, foods, but by integrating food-based activities into the required curriculum alongside Math and English is helping to reinforce the idea that learning how to grow, prepare and cooks one's own food is a key life skill - just like reading and writing.





Edible Schoolyard Programs

For many children, especially those growing up in urban areas, there is a significant lack in opportunity to learn about what real food is, what it tastes like and what makes it better for us than the processed foods that fill grocery store shelves today. Comprised of both an organic garden and a kitchen classroom, edible schoolyard programs such as the one at Martin Luther King, Jr. Middle School in Berkeley, California are making significant inroads in changing this. As an integrated part of the school curriculum, children experience first hand how to grow, harvest, prepare, and share local fresh foods - contributing significantly not only to their appreciation of what good food is, and how to grow it, but providing them the skills to be able to translate this appreciation into an increased capacity for buying and consuming local fresh foods outside the classroom as well.

Chapter Three

A System for the South-East Sector

"Like air, water, and shelter, food is essential for life and plays a central role in our health, economy, and culture. Healthy, sustainable communities require healthy, sustainable food systems." - American Planning Association

Although cities and rural municipalities alike are beginning to recognize the economic, social and human health benefits of local food systems, and are beginning to develop guidelines for integrating infrastructure that supports such systems into both city and rural planning, in the vast majority of communities, not just in Saskatchewan, but all over North America, private business and capital enterprise still shape *how*, and as a result, to a large degree *what* we all eat, while any local food initiatives (such as those investigated in the previous chapter) that do come to fruition are the result of grass-roots efforts driven by producers and consumers themselves, in many cases without any help from (and in some cases even hindered by - i.e. with policies that favor big box retail over smaller initiatives) the cities or rural municipalities of which they are part.

This thesis proposes that just as cities and rural municipalities take an active role in developing the water, electrical and transportation infrastructure of their respective built environments, they too have the opportunity, and indeed obligation, to plan for, design and build sustainable food systems for all communities. And so, the remainder of this thesis is dedicated to understanding what such a system could look like, and what the implications of this system (capable of delivering the 80 percent food supply as previously outlined) would be for both rural and urban communities throughout the South-East Sector.

Not saying that this the *only* way a local food system could be built for the city of Saskatoon. While it is believed that all of the typologies previously investigated can (and most likely will) play a significant or unique role in the building of a comprehensive local food system for the city of Saskatoon, since some of these typologies have the ability to respond to/capitalize on the opportunities/issues of the place better than others, and since some (if located or developed correctly) may even acts as catalysts for the establishment of others, a necessarily limited system has been outlined.

For in this way, not only will it be possible to understand the opportunities/implications of such a system on both rural and urban communities in a timely fashion, but it will also result in the development of a framework. A framework of key "capacity-building" infrastructure upon which more elaborate or innovative typologies can be added as both producer and consumer gain capacity for such initiatives.

Chapter contents:

3.1 A Framework for Building Capacity; A Model System for Understanding Capacity 56

3.2 Determining a Rural Study Area 68

3.3 The Town of Craik and its Surrounding 15 km Hinterland: An Introduction 74

3.4 Determining an Urban Study Area 78

3.5 Three Types of Nodes, one Case Study Area 82

3.6 The Node of Holliston Park and its Surrounding Urban Community: An Introduction 86

3.7 Preface to the Last Two Chapters 90

3.1 A Framework for Building Capacity; A Model System for Understanding Capacity

As discussed earlier, there does exist a population interested in returning to land in order to make a living producing food in a safe and healthy way, while at the same time there is a growing interest from the rest of us in buying and eating such foodstuffs, however there exist significant challenges in building the capacity of such a system on both sides.

Thus, this thesis proposes that if developed, a network of "processing/support centers" in the rural area combined with neighbourhood farmers' markets and "urban support facilities" in the urban area could not only provide the framework upon which to build both producer and consumer capacity in the South-East Sector, but by projecting a community of producers around one "rural center", while a community of consumers around one market, a model system could also be developed in order to both *quantify* and *qualify* the effect of such a system not only for these two communities, but by extension for the entire sector, and even the entire city.

The following section briefly outlines the four components of the imagined system (small-scale rural production, rural processing/support centers, neighbourhood farmers' markets and community support facilities) and briefly discusses the role of each in building a local sustainable food system for the South-East Sector.

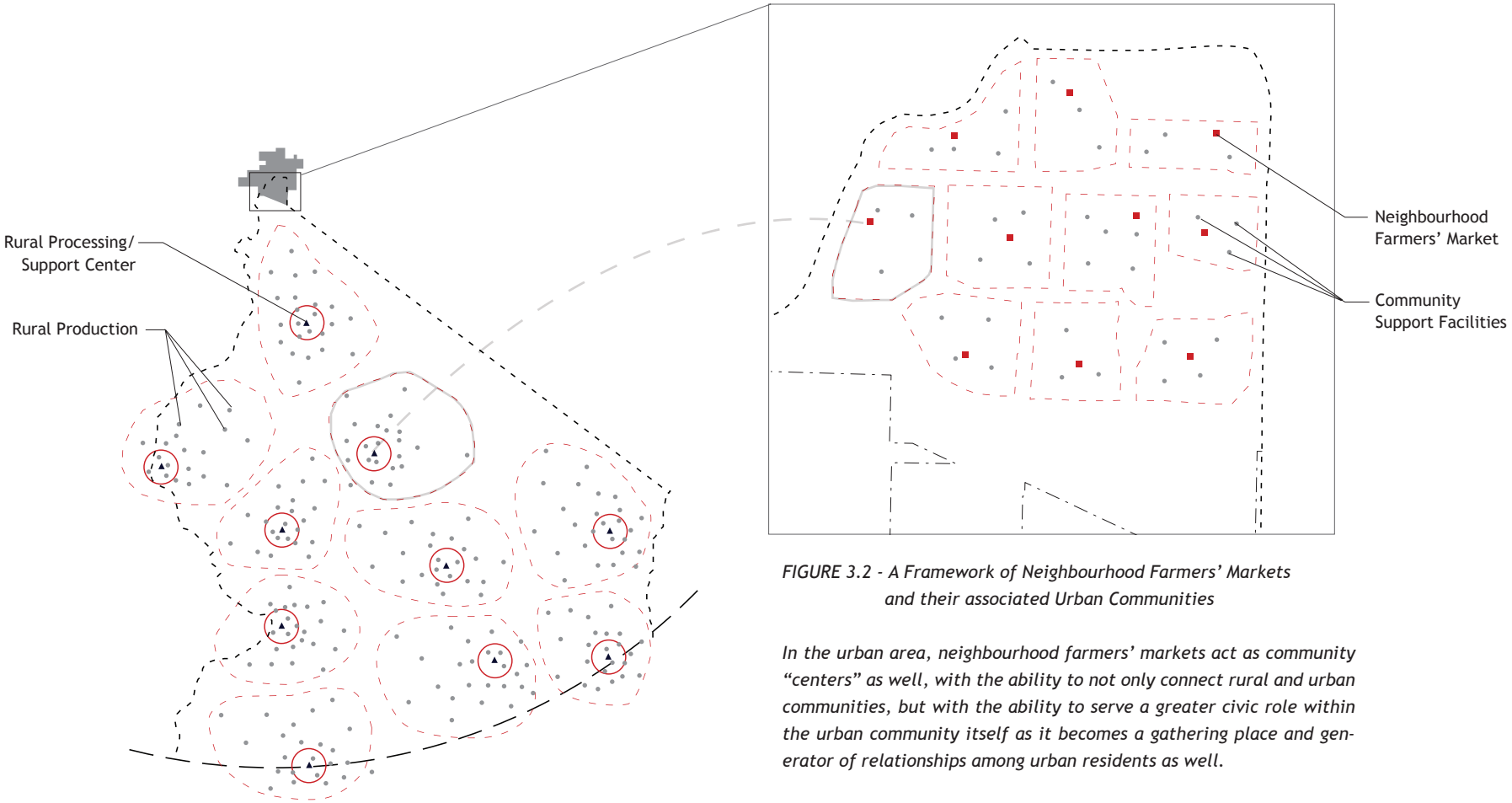


FIGURE 3.1 - A Framework of Rural Processing/Support Centers and their associated Rural Communities

Just as in the past when rail-line grain elevators became the gathering place and physical evidence of the otherwise 'invisible' rural community on the Prairies, it is imagined that "rural processing/support centers" can become the social and physical heart of a new kind of rural community on the Prairies - one that supports and in turn is supported by a group of small-scale, sustainable producers.

FIGURE 3.2 - A Framework of Neighbourhood Farmers' Markets and their associated Urban Communities

In the urban area, neighbourhood farmers' markets act as community "centers" as well, with the ability to not only connect rural and urban communities, but with the ability to serve a greater civic role within the urban community itself as it becomes a gathering place and generator of relationships among urban residents as well.

Small-scale Rural Production

While the vast majority of production currently occurring in the South-East Sector is large-scale grains and oilseeds, across the province, farmers are proving that this is not the *only* thing that can be grown. The emergence of small-scale fruit farms along the South Saskatchewan River, bison ranching near Cudworth, as well as small-scale vegetable growers within the city of Saskatoon (and several other small rural towns) are proving that not only is small-scale natural-systems-based production possible on the Prairies, but as demand for local foodstuffs grow, it is becoming more and more economically viable as well.

And so, this thesis proposes that as consumer demand for locally-grown foodstuffs continues to increase, small-scale natural-system-based production will begin to established throughout the South-East Sector. And although some areas of this Sector may be better suited to some types of production than others (i.e. the irrigated land around Outlook for fruit and vegetable production, or the rough terrain of the Grainland Community Pasture for bison and cattle ranching) requiring quite minimal acreage, and being able to benefit significantly from man-made microclimate amendments such as windbreaks, it is imagined that there exists significant opportunity throughout the Sector for locating every kind of production previously identified. (See descriptions alongside each type of production regarding the conditions required.)

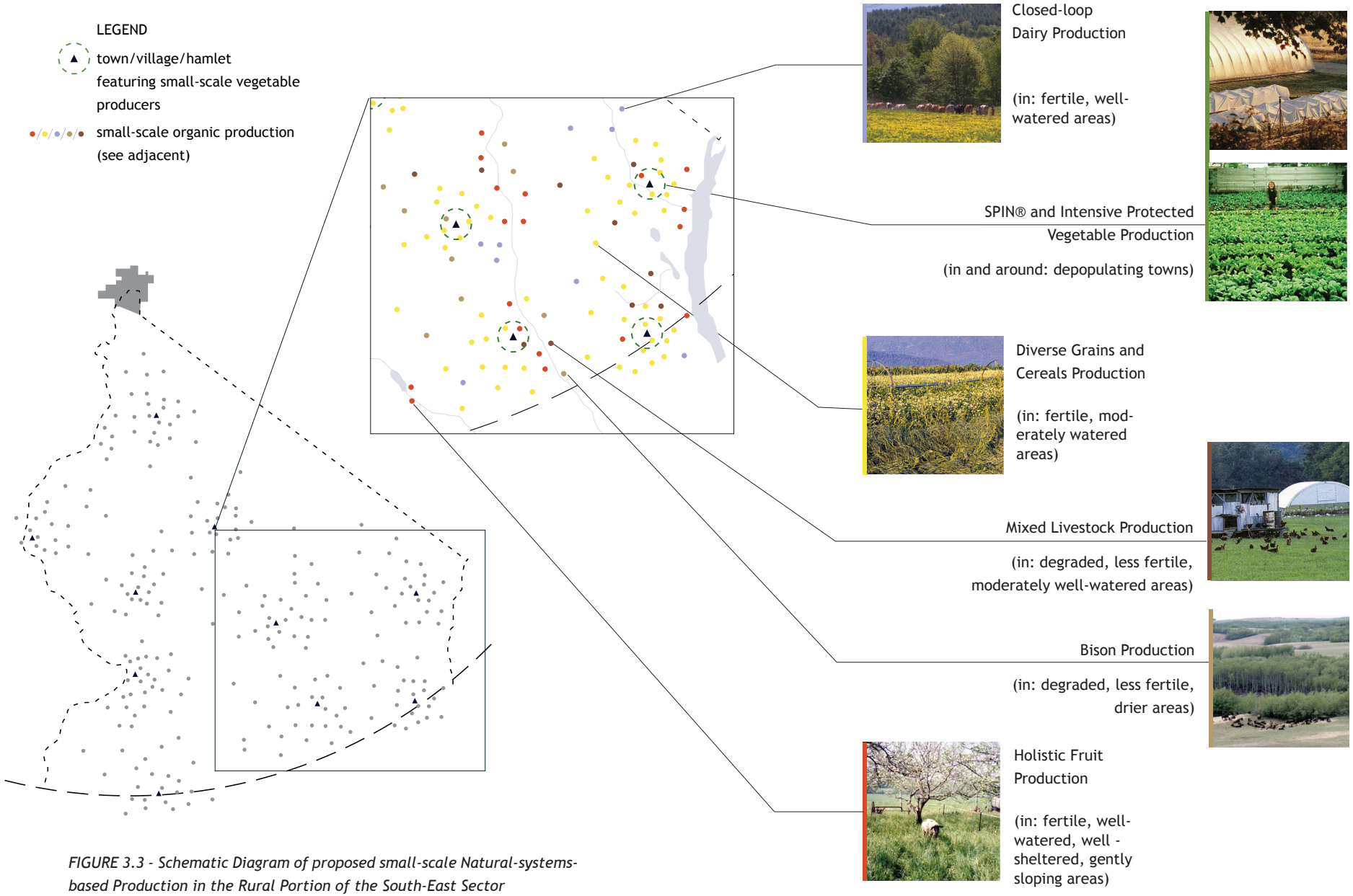


FIGURE 3.3 - Schematic Diagram of proposed small-scale Natural-systems-based Production in the Rural Portion of the South-East Sector

Rural Processing/Support Centers

Comprised of small-scale rural processing facilities (such as those described in Section 2.2 as “rural center processing” and “mobile processing”), as well as agricultural extension services such as those described under “rural resource centers” (e.g. seed saving facilities, resource libraries, crop test plots, etc.), it is imagined that “rural processing/support centers” could not only provide the decentralized food infrastructure required to ensure a safe and secure food system, but dispersed in rural towns throughout the sector, could provide the economic as well as social support many of these places need to not only support the community already there, but to provide the means by which to encourage a new generation of farmers to emerge. A generation of farmers dedicated not only to small-scale sustainable agriculture, but to each other, and to the stewardship of the land – indeed, one of our most precious natural resources.

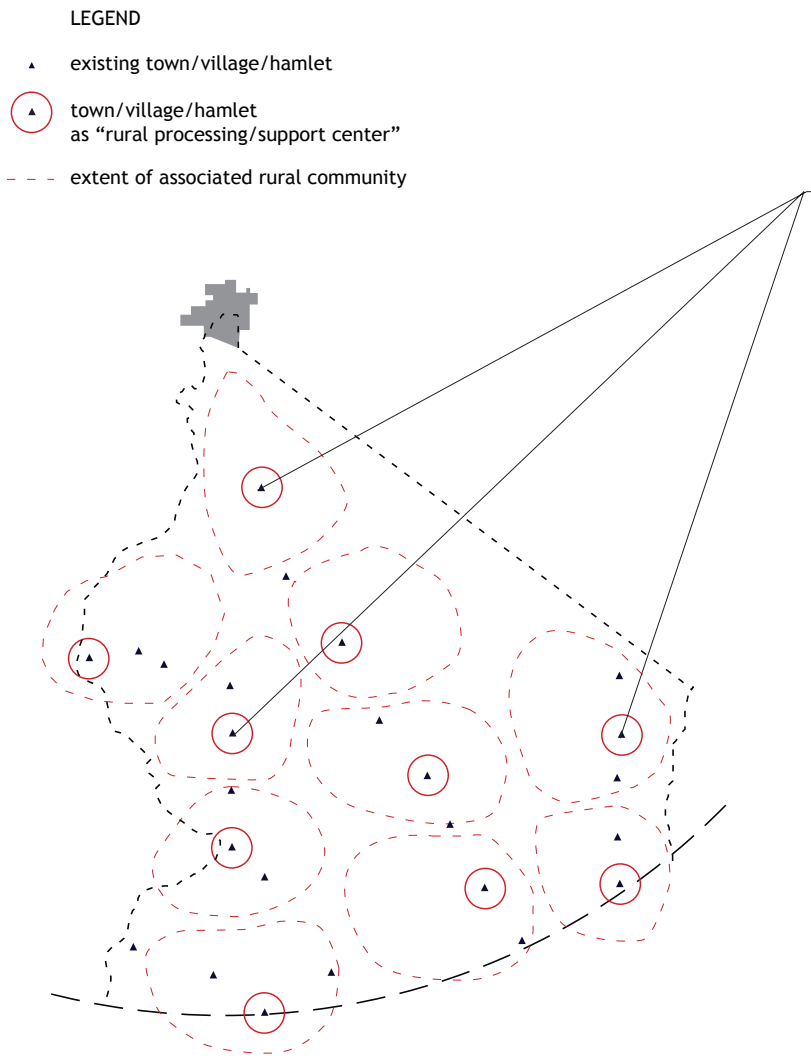


FIGURE 3.4 - Schematic Diagram of proposed Processing/Support Centers in the Rural Portion of the South-East Sector

Rural Processing/Support Centers

Comprised of:



Research/Support Facilities



Rural Centre Processing



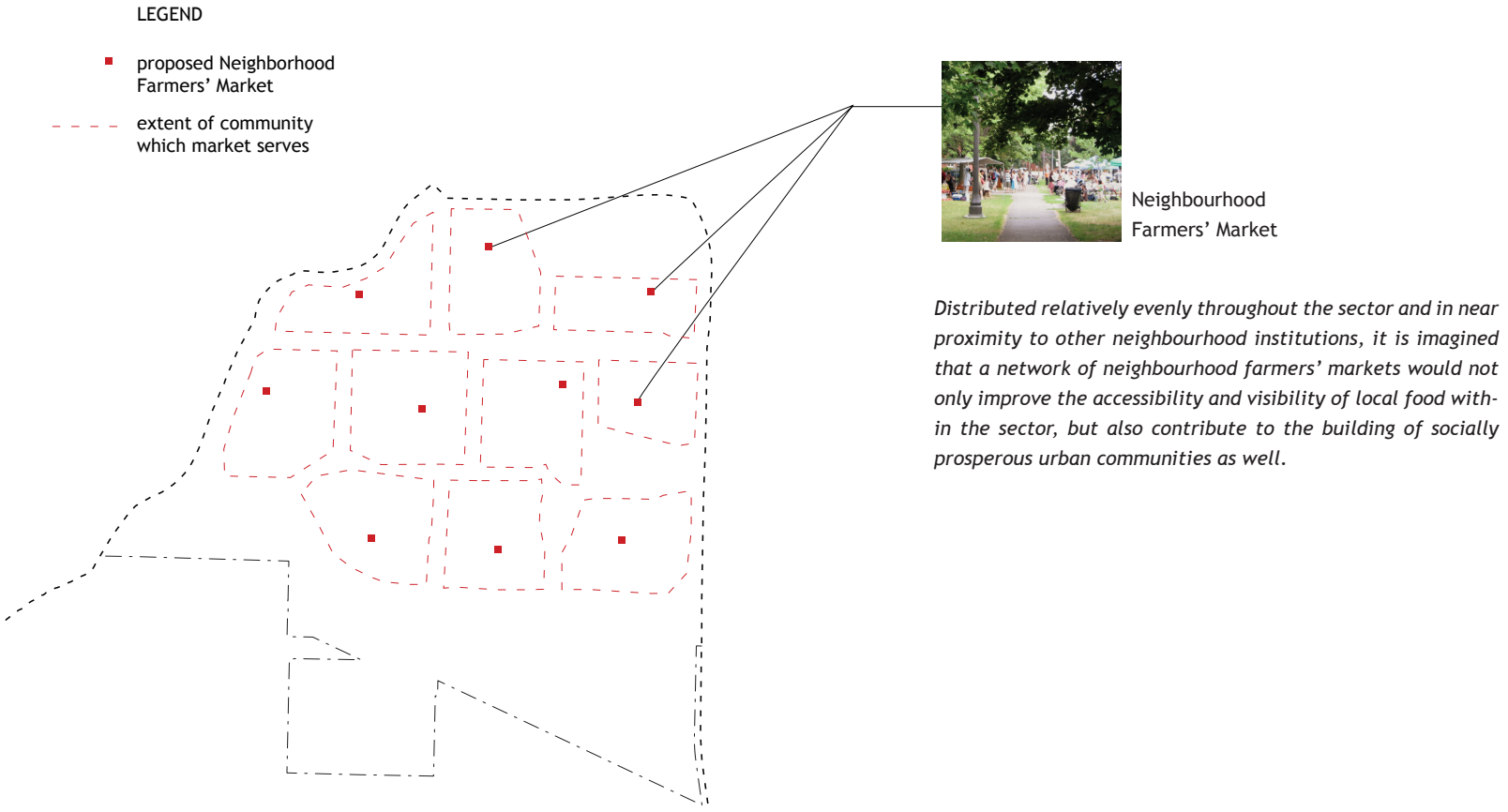
Mobile Shared Processing

Grouped together and strategically located in small rural towns throughout the sector, small-scale processing facilities in combination with rural extension services unique to small-scale organic agriculture, could become not only the reinvigorated social heart, but also physical symbol of a newly defined rural community on the Prairies - one that is built around a community of producers practicing sustainable, small-scale agriculture.

Neighbourhood Farmers' Markets

Requiring minimal infrastructure, and easily set up in a variety of urban locations, neighbourhood farmers' markets may be the most effective and enjoyable way to immediately connect as many people as possible to a source of fresh, nutritious food while building their capacity for more innovative (and perhaps rewarding) forms of direct producer-to-consumer distribution such as on-farm stores or CSAs.

Distributed throughout the sector such that every resident is walking distance, it is imagined that a network of neighbourhood farmers' markets would not only improve the accessibility and visibility of local food within the sector; but located in near proximity to other neighbourhood amenities such as schools, libraries, parks and playgrounds, such markets also contribute to the reestablishment of food distribution as a culturally important piece of every neighbourhood. And in addition to this, by bringing together not only previously disassociated rural and urban communities, but members of the urban community themselves, such markets can also act as a catalyst for the building of more vibrant, socially prosperous urban communities as well.



Distributed relatively evenly throughout the sector and in near proximity to other neighbourhood institutions, it is imagined that a network of neighbourhood farmers' markets would not only improve the accessibility and visibility of local food within the sector, but also contribute to the building of socially prosperous urban communities as well.

FIGURE 3.5 - Schematic Diagram of proposed Neighbourhood Farmers' Markets in the Urban Portion of the South-East Sector

Community Support Facilities

Established in conjunction with already existing neighbourhood amenities and organizations such as public parks, schools, religious centres, or other community-based support groups, “community support facilities” such as community gardens, community kitchens, community storage facilities and edible schoolyard programs could not only be set-up with relatively minimal expense and organization, but when combined with the proposed neighbourhood farmers’ markets ensure that every member of the community has access not only to fresh food, but the facilities required to turn this availability into a year-round affordable, enjoyable and ultimately sustainable cuisine.

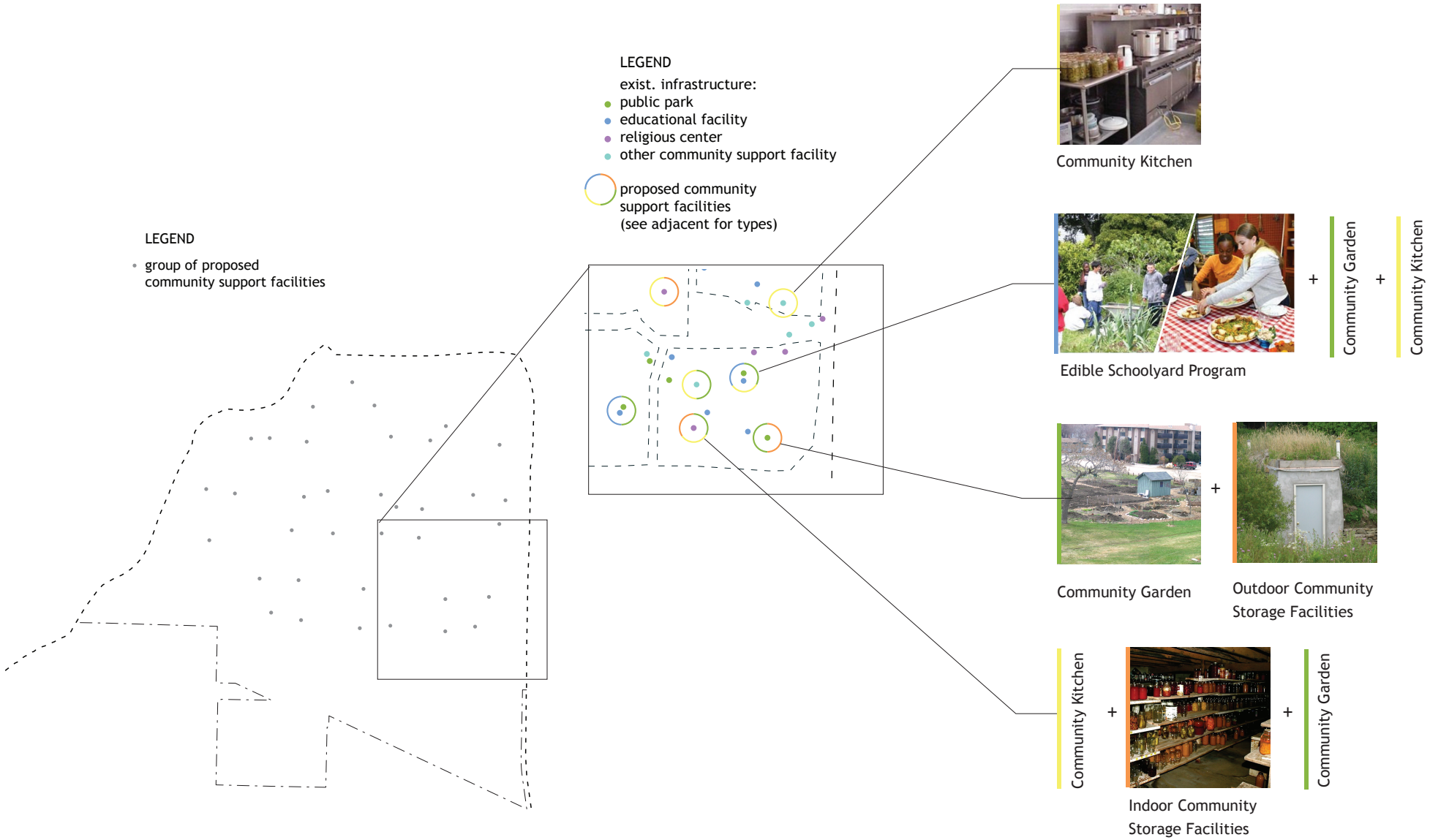


FIGURE 3.6 - Schematic Diagram of proposed Community Support Facilities in the Urban Portion of the South-East Sector

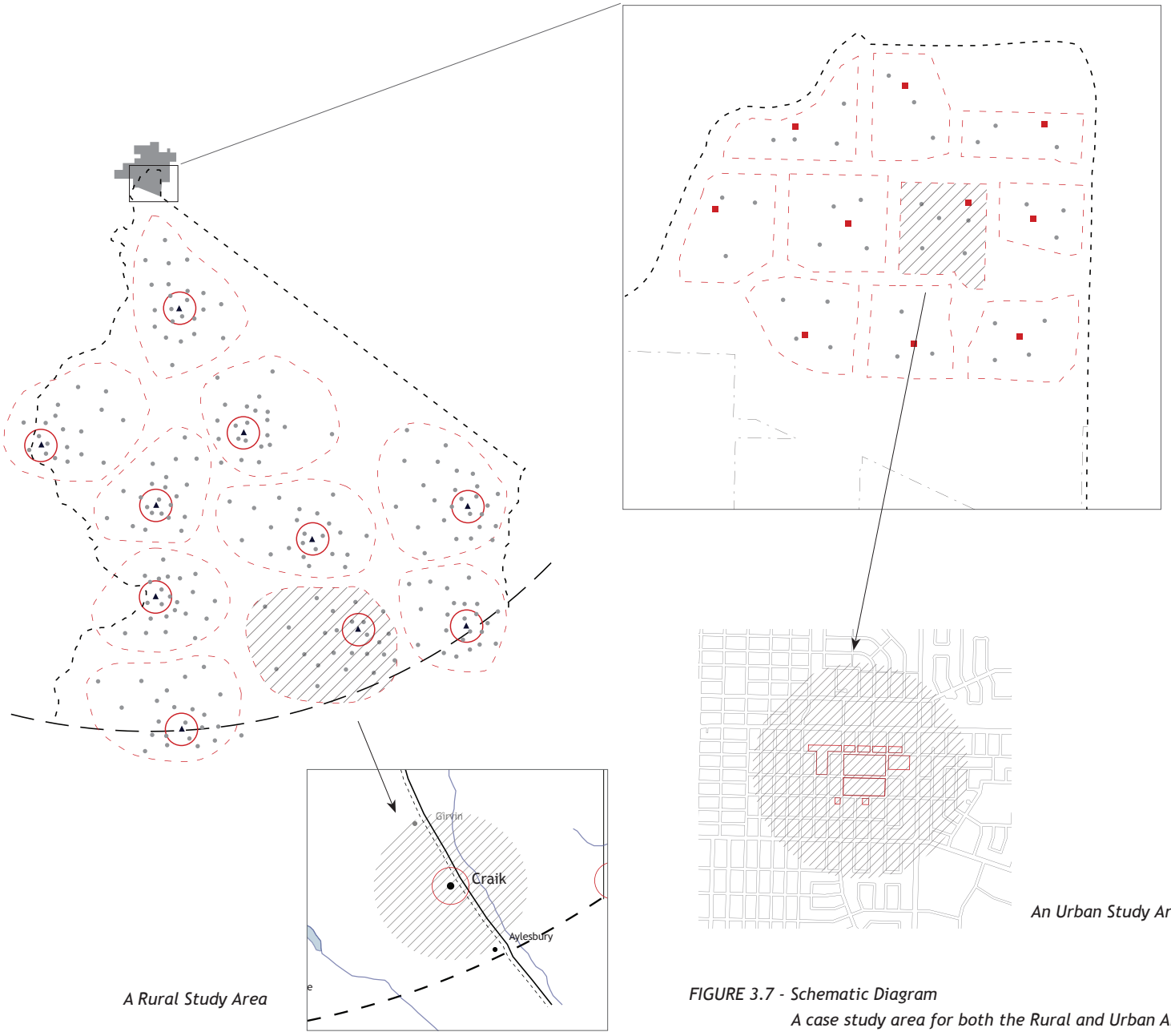
One Rural, One Urban Community as a Case Study Area for Understanding/Envisioning Capacity

In order to understand if such a system could in fact deliver 80 percent of the foodstuffs required by the sector, and what the implications of this would be for both rural and urban communities alike, a case study area was required for each.

And so, comprised of 5 different parts:

3.2 Determining a Rural Study Area,
3.3 The Town of Craik and its Surrounding 15 km Hinterland,
3.4 Determining an Urban Study Area,
3.5 Three Types of Nodes, One Case Study Area, and
3.6 The Node of Holliston Park and its Surrounding Urban Community;

the following section not only *describes* one rural and one urban community to be used as case study areas, but also outlines how each was *defined* - and in so doing, develops an overall system in both the rural portion of the Sector as well as the urban portion of the Sector, which could be used to translate the system (that is eventually developed for the two case study areas) to the entire South-East Sector.



A Rural Study Area

An Urban Study Area

FIGURE 3.7 - Schematic Diagram
A case study area for both the Rural and Urban Area

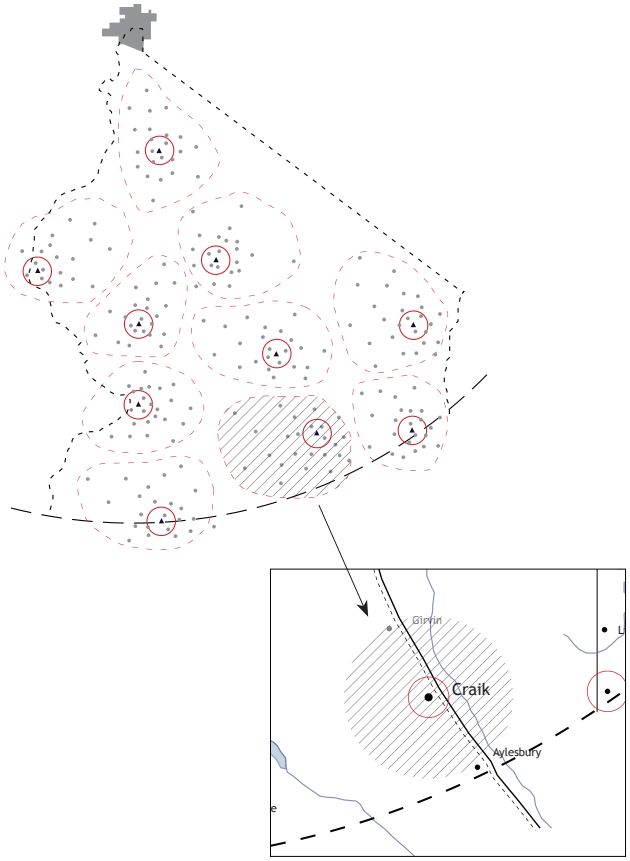


FIGURE 3.8 - A Rural Case Study Area

The town of Craik and a rural area extending for a 15 km radius has been defined/chosen as a rural case study area as the result of several factors.

3.2 Determining a Rural Study Area

While any one of the 25 communities currently existing within the Sector (together with a sizable amount of surrounding land) could have been chosen as a case study area for understanding the opportunities and implications of such a system within the rural area, the town of Craik together with a 15 kilometer hinterland has been chosen/defined for several reasons.

First of all, because of the author's familiarity with the area, but secondly because of the town's ability to fit within a number of criteria deemed to be important when planning such a system as a whole: town size/demographics, the existence of a population interested in alternative agricultural practices, and relative location. The following section illustrates how these three characteristics have been used to not only identify Craik as a reasonable case study area, but to outline a reasonable overall system as well, in order to arrive at a total case study area which extends for a 15 km radius around the town itself.

Characteristic One: Town Size/Demographics

Although no community is too small to be developed as a "rural processing/support center" (and in fact the smaller the town, the greater the impact of such increased development), from a planning perspective it seems to makes sense to focus on building upon communities that appear to be doing "the best" in terms of current town size, and number of services provided.

Of the 25 communities currently existing within the sector, nine have populations of 250 or more, which seems to be large enough in many cases to

LEGEND

town of 1,000 to 2,000

village of 250 to 650

village of 125 or less

unnamed = lost status

towns that meet size criteria

* recent population gain or stasis*

** consistant population gain*

* See Appendix Four for explanation

be able to provide many of the commercial and institutional services required by a community to maintain some degree of self-sufficiency. In addition to these, three more towns - Mistusinne, Strongfield, and Glenside - may also be ideal locations to develop as rural nodes given that they have been experiencing some population growth as of late.

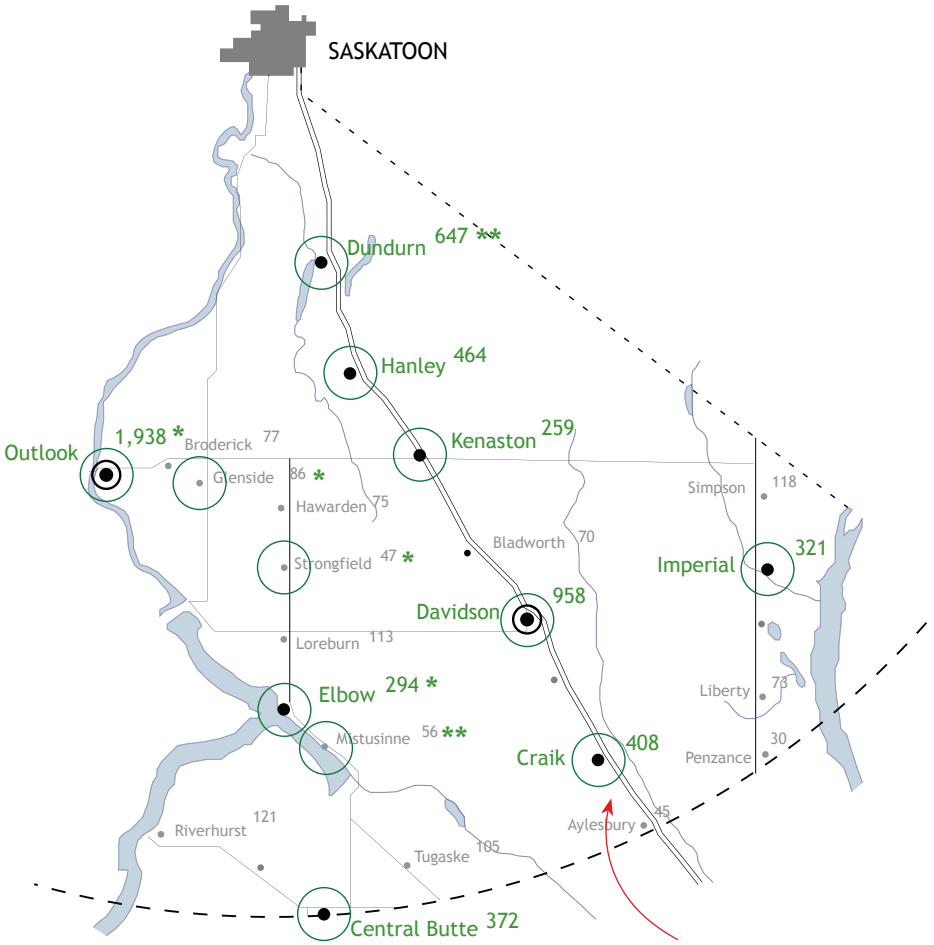


FIGURE 3.9 - Town Size/Demographics within the Rural Portion of the Sector

With a population of over 400, and many essential commercial and institutional services (e.g. hardware store, grocery store, health care center, library, community hall, recreational facilities), Craik along with 11 other towns have been identified as "potential rural nodes" from a town size/demographic point of view. (See Appendix Four for a chart of population figures as well as a brief description of all 25 communities).

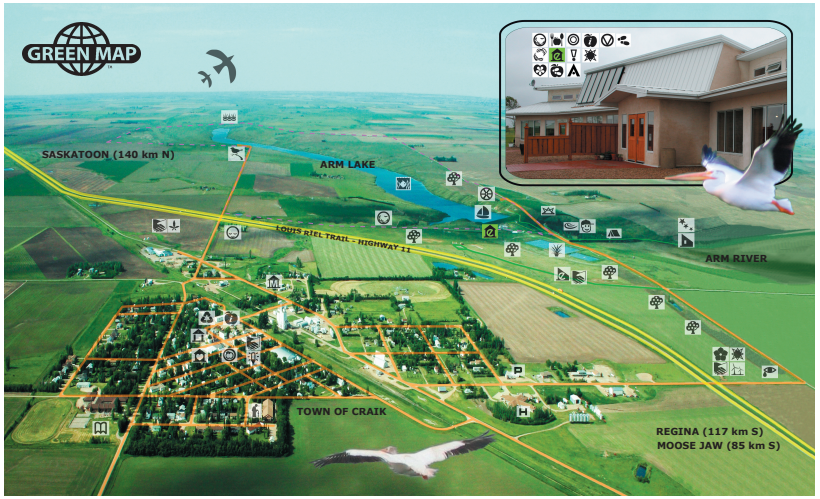


FIGURE 3.10 - Craik's "Green Map"

Inspired by local school children, a "Green map" of the town of Craik reveals that "the spirit of the building" (CSLP Eco-Center) is in fact "catching on" as a local businessman recently said. Environmental sustainability has become a priority for this town, making it an ideal location to develop as a "rural processing/support center" as outlined in this proposal. See Appendix Four for enlargement and legend of map.

Characteristic Two:
Existence of a Population interested in
Alternative Agricultural Practices

Besides building upon the largest, most vital existing rural towns, it also makes sense that "rural processing/support centers" be located such that they build upon the momentum being generated by existing producers, consumers, or government initiatives promoting small scale organic agriculture within the sector already. Even with the author's limited knowledge of the area, five such initiatives have been identified (see Figure 3.10 and Appendix Four for more information), of which the most well-known perhaps, is the Craik Sustainable Living Project (CSLP).

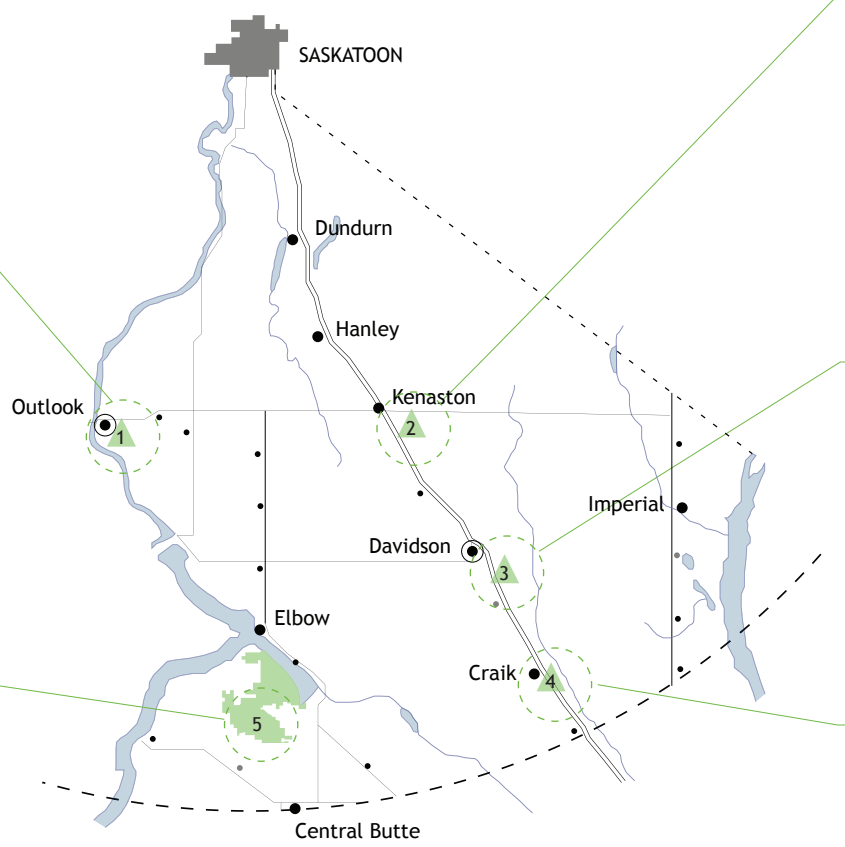
Described on the town's web site as a "long-term project that addresses the issue of sustainability and rural revitalization through physical demonstration of viable solutions," (Craik Sustainable Living Project) the CSLP is currently comprised of an Eco-Center, two Eco-Villages (still under construction), an annual solar fair, an annual Earth Day film festival and many more "green" initiatives. Not surprisingly, the project has attracted many individuals and organizations interested in pursuing sustainable endeavours - agriculture included. Currently, a small-scale flax producer/processor has set up shop nearby, a hemp producer has indicated interest in the town, while multiple community greenhouses have been erected in the town as well. Most recently, the Praxis School (an international hands-on learning school) has indicated interest in locating a school for 300 students within the town as well.



Canada-Saskatchewan Irrigation Diversification Centre



Grainland Community Pasture

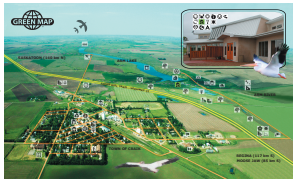




The Taylor Family Farm



The Back to the Farm Research Farm



Craik Sustainable Living Project (See adjacent enlargement)

FIGURE 3.11 - Current Sustainable Agriculture Initiatives within the Sector

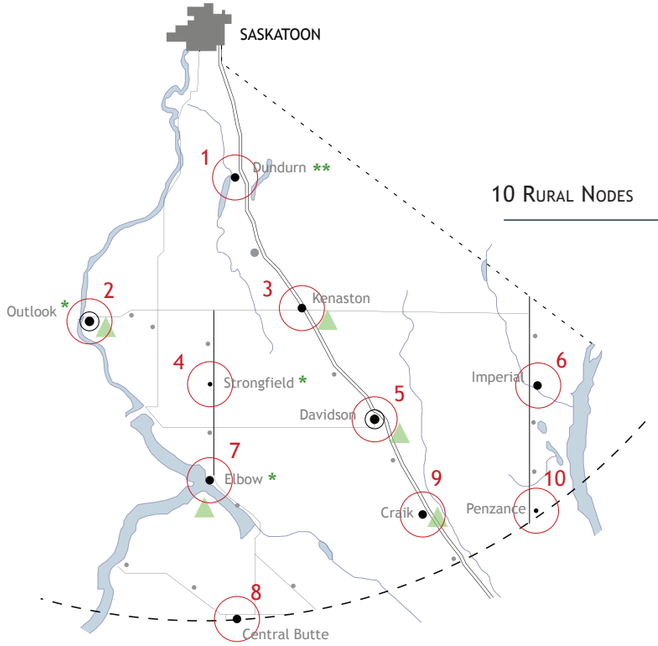
Supporting organic agricultural research and demonstration at the grass-roots or governmental level, all five initiatives mentioned here could be catalysts for the development of rural nodes either on location or in a nearby town associated with the endeavor. See Appendix Four for detailed description of initiatives 1,2,3 and 5.

Characteristic Three:
Proximity to other Probable Centers

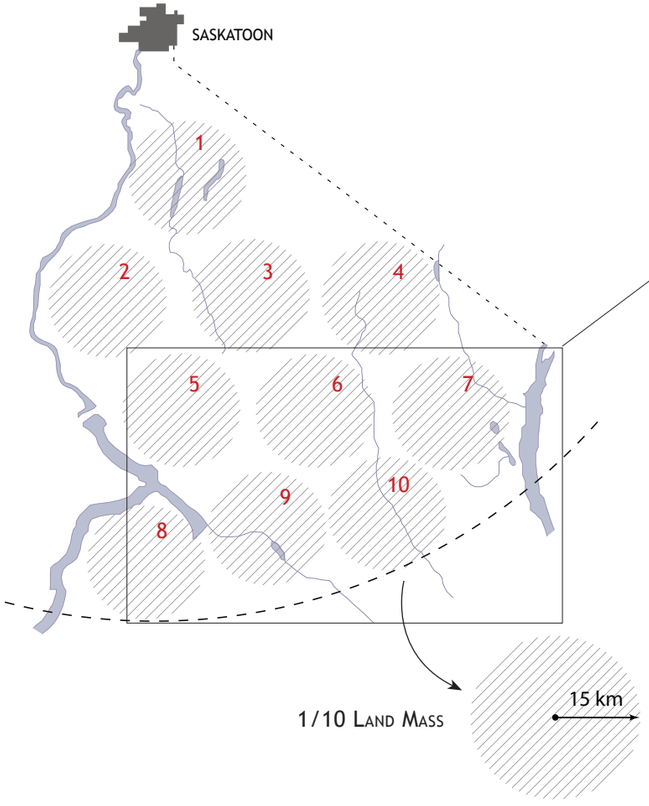
The third characteristic to be considered in the development of such a system is the relative proximity of towns to one another. Besides having a sizable population, and demonstrating interest in alternative agricultural practices it is also important that such nodes be distributed relatively evenly throughout the sector, in order that as many farmers are within as near proximity to a node as possible.

The Result:
A System of 10 Rural Nodes and 15 km Hinterlands

And so, besides confirming that Craik is in fact an ideal location to choose as a case study area, the previous study has also confirmed that a system of 10 such nodes (see Figure 3.12) seems to make sense based on the geographic and demographic reality of the sector (see caption of Figure 3.12), and as such will be used as the factor for determining the extent of land to be included as part of the case study area. (See figures and captions of Figures 3.13 and 3.14.)



10 Rural Nodes



1/10 Land Mass

15 km

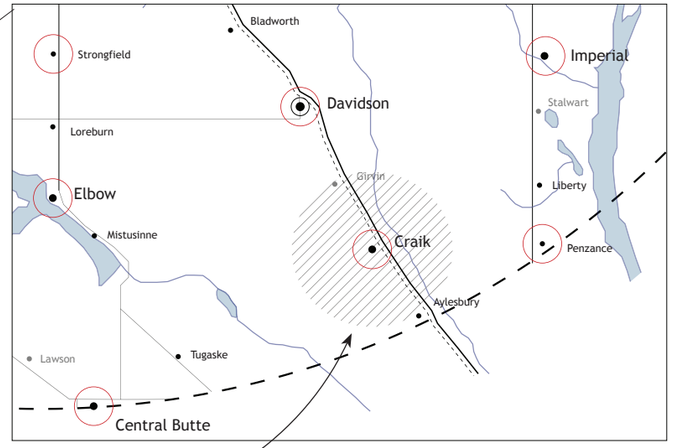


FIGURE 3.12 - A System of 10 Rural Nodes

Incorporating eight of the sector's nine largest towns as well as all of the towns identified as being connected to existing sustainable agricultural initiatives, this thesis proposes that a system of ten rural nodes be established in the South-East Sector.

FIGURE 3.13 - A System of 15 km Hinterlands

Given a system of 10 nodes (in order to make a rough calculation regarding the required capacity of any given community), it has been assumed that each community would be responsible for producing roughly 1/10 of all the food required by the sector. And so, in order to develop a representative case study are, it has been imagined that each node has roughly 1/10 of the required land mass as well - the equivalent to a hinterland of approximately 30 km in diameter.

FIGURE 3.14 - A Case Study Area

And so, for the purpose of this thesis the town of Craik and a rural area extending 15 km in all directions will be used as a case study area for understanding/envisioning the implications of a system of production and processing capable of delivering 1/10 of the foodstuffs required by the entire Sector.

3.3 The Town of Craik and its Surrounding 15 km Hinterland: An Introduction

The 15 km Hinterland

Not unlike the condition of the rural sector as a whole, the vast majority of land (approximately 85 percent*) within the 15 km area surrounding Craik is relatively flat and fertile, and as a result has relatively few restrictions regarding what can be grown. The exception to this is a limited amount of hilly and/or degraded land bordering Arm River (east of Craik) as well as several other smaller waterways. While the majority of this uncultivated land is currently being used for livestock grazing, being well watered and gently sloping in some cases, such land holds opportunity to be used for dairy and fruit production as well.

Besides the approximately 700 km^2 of farmland however, Craik's 15 km hinterland also includes approximately 90 residences** (not including the town sites of Craik, Aylesbury or Girvin) and according to Statistics Canada has a population of approximately 215 persons.*** Including the three town-sites, the population of the entire area is approximately 700 people.

1



FIGURE 3.15 - The vast majority of land in the area is flat and fertile, with few restrictions regarding what can be grown.

2



FIGURE 3.16 - There also exists a limited amount of hilly and/or degraded land that is currently being used for livestock grazing, but could be used for dairy or fruit production as well.

---

*author's approximation based on aerial imagery sourced from ISC Map & Photo Library, see source information for Figure 3.17

**author's approximation based on RM maps of Craik No.222 and Arm River No.252, see source information for Figure 3.17

***population density of both RM Arm River and Craik as of 2006 census was 0.3 persons per km^2, multiplied by 707 k^{m2}



FIGURE 3.17 - Craik's 15 km Hinterland

The Town site of Craik, Saskatchewan

Despite having lost one third of its population in the last 50 years (from a peak of 607 people in 1956 to 408 in 2006 - McLennan 2008, 74) the town itself still maintains a good diversity of essential services: a K-12 school, a Health Care Center, an RCMP detachment, a weekly newspaper, two churches, a post office, a grocery store, a hardware store, a bank, a library and a community hall.

In addition to this, the town currently has about 200 residential buildings, three quarters of which are located on the west side of town, divided from the east by the railway which runs diagonally through the settlement. (See Figure 3.20.) And although (together with the town's main street which runs perpendicular to this - see photo reference marker "2"), "elevator row" was once the physical and psychological heart of the town, with only one elevator remaining, a significant gap has been left.

This physical vacancy, combined with a large number of empty residential as well as commercial lots throughout the town provide significant opportunities not only for the development of small scale rural processing facilities as proposed, but also small-scale vegetable production as well - for with very few borders (i.e. only a small ravine/wetland area to the north, and Highway 11 along the east) constraining the growth of the town, there exists the possibility of such plots extending beyond town limits as well.

1



FIGURE 3.18 - A single rain-line elevator marks the town along the once-again operational rail line running between Regina and Saskatoon.

2



FIGURE 3.19 - While many businesses and institutions still reside on Craik's Main Street, a significant number of vacant lots and buildings present considerable opportunity for development.

*author's estimation based on whole town population density as reported by statistics Canada, combined with mapped information regarding location of residential units
**Statistics Canada, 2006 profiles.

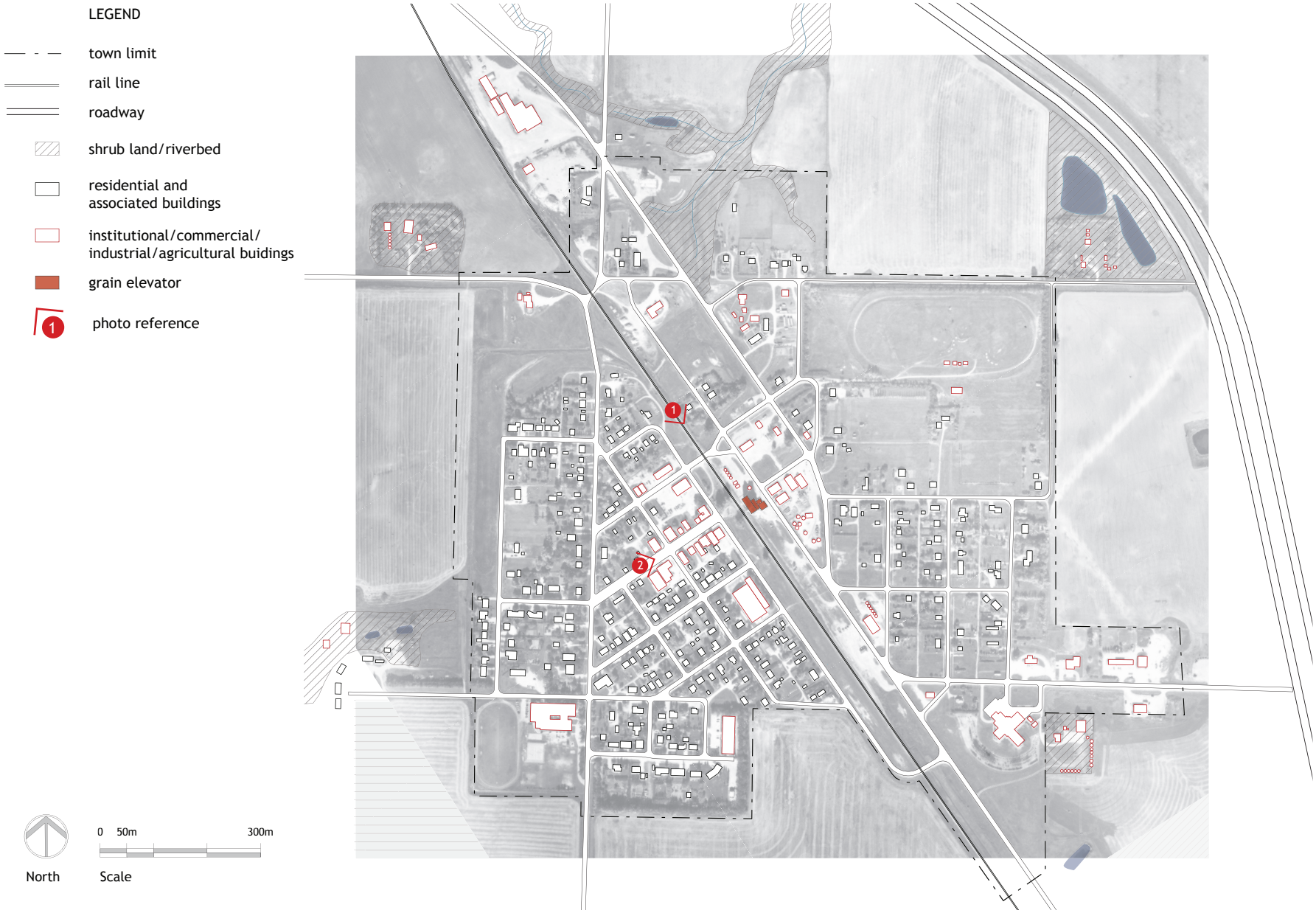


FIGURE 3.20 - The Town Site of Craik, Saskatchewan.

Having lost one third its population since 1956, and constrained by few physical barriers, considerable opportunity for development exists both within town limits of Craik, as well as its near periphery.

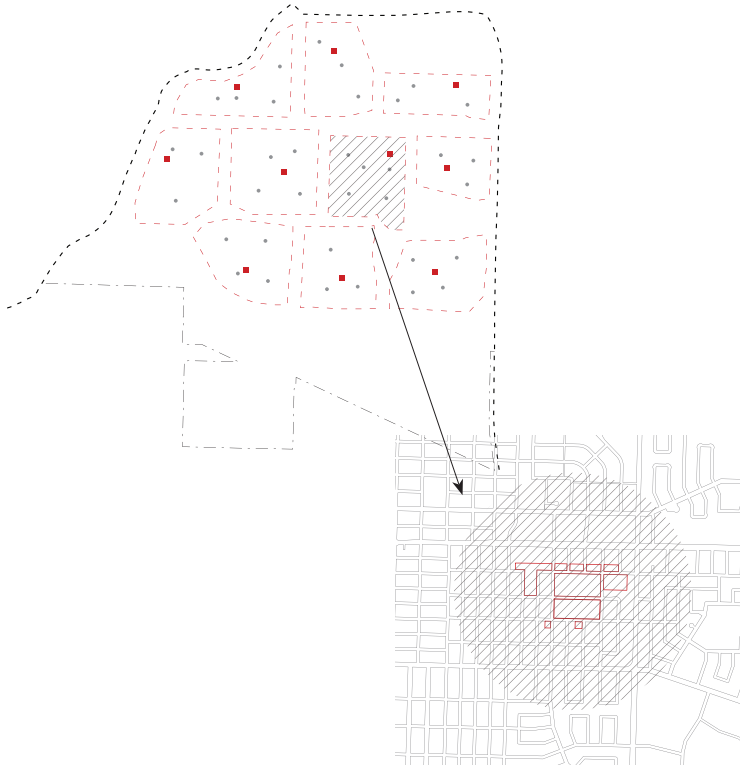


FIGURE 3.21 - An Urban Case Study Area

The node of Holliston Park and an urban community extending 800 m has been defined/chosen as an urban case study as the result of exercises.

3.4 Determining an Urban Study Area

Similarly to the process used for determining a case study area in the rural portion of the Sector, the node of Holliston Park* (and an urban community extending approximately 800 m in all directions) has been defined/chosen as a case study area for the urban portion of the Sector, first of all, as the result of a mapping exercise which sought to outline a possible system for the entire Sector.

A Map of Urban "Node-making" Elements

Located not in isolation, but in close proximity to other public amenities such as parks, schools, churches, small-scale commercial facilities as well as higher density residential areas; it is imagined that a network of neighbourhood farmers' markets throughout the South-East Sector would not only contribute to the accessibility of local food within the said area, but could also contribute to the development of strong urban "nodes" (i.e. areas within the Sector where groupings of these urban elements could act as a kind of "locus" - a gathering place, a generator of true "community" if you will for the surrounding neighbourhood it serves) within the area as well.

And so, the first exercise in determining an urban case study area was to map public parks, commercial areas, social community infrastructure, and residential areas throughout the Sector, in order to determine if any such groupings already exist, and if so, where. Figure 3.22 is the summary of this study. (See Appendix Five for additional maps and discussion regarding the contribution of all four elements to the building of strong urban nodes.)

*this not only includes the public park itself, but a number of other urban elements to be described shortly.



FIGURE 3.22 - A Map of Potential "Node-Making" Elements within the Urban Sector

By mapping the distribution of public parks, commercial areas, social community infrastructure, and residential areas (all but low-density residential) it becomes possible to discover groupings of such elements with the potential of becoming strong urban nodes. Appendix Five for additional maps and discussion.

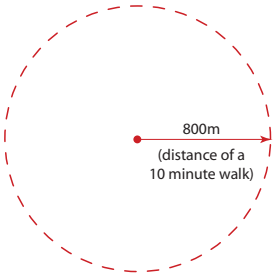


FIGURE 3.23 - The distance of a 10-minute walk

A 10-minute Walk

The second piece of information used to determine a reasonable case study area in the urban portion of the Sector was the distance of a 10-minute walk.

Since the goal was to develop a system that would see every resident within walking distance of a market, the radius of a 10-minute walk (by common estimates, 800 m) was used as a guideline for determining the approximate service area of any given market.

The Result: A System of 10 Urban Nodes and Their Surrounding Urban Neighbourhoods

Combining these two things (i.e. the map of potential node-making elements and the distance of a 10-minute walk), a system of 10 urban nodes has been developed.

Again, not saying these are the only 10 nodes that could be developed, or that 10 is the absolutely ideal number of nodes within the urban portion of the Sector. However, for the purpose of this thesis such a system works well for not only does it allow for an easy correlation between rural producer community and urban consumer community (both being equal to 10), but it also results in a very manageable case study area. In a system of 10 relatively evenly distributed markets, each market/node would act as community center for about 1/10 of the entire sector - about 4,900 people.

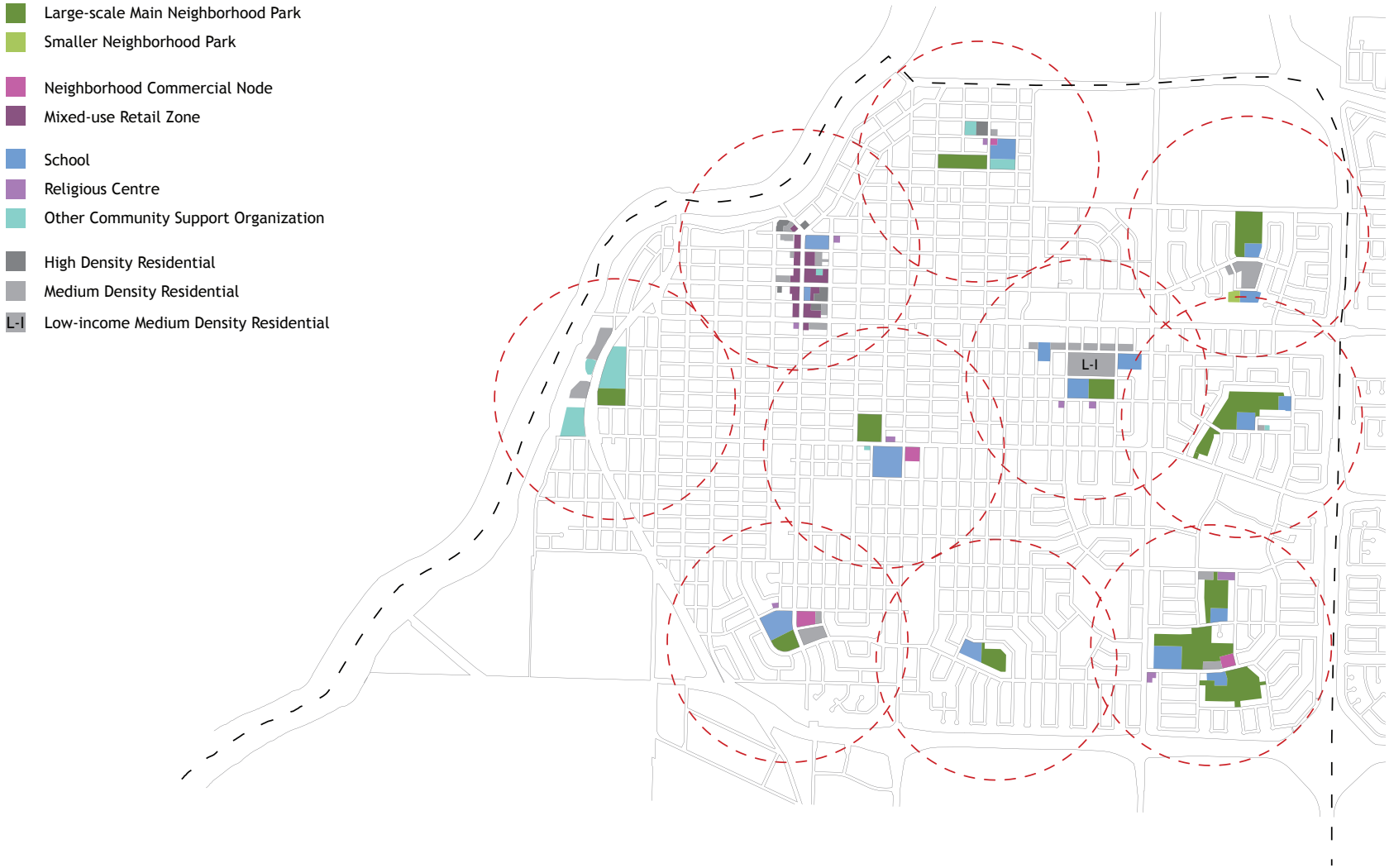


FIGURE 3.24 - A System of 10 Potential Urban Nodes

By combining the spatial territory of a 10-minute walk with a map of all the possible "node-making" elements identified, a system of 10 potential urban nodes has been developed.

3.5 Three Types of Nodes, One Case Study Area

While any one of these nodes (together with its surrounding urban area) could have been chosen as a case study area for understanding the capacity/possibilities of such a system within the urban portion of the Sector, a quick survey reveals that several different types of nodes have emerged: “mixed-use retail nodes”, “main neighbourhood park nodes”; and “multiple main neighbourhood park nodes”. The following section briefly discusses all three, and chooses one to be used as the urban case study area.

Mixed-use Retail Nodes

As its name suggests the heart of the only “mixed-use retail node” in the sector is the pedestrian-oriented small-scale retail zone of Broadway Avenue. Supported by a significant amount of social community infrastructure (see Appendix Five for description) as well as residential density, this commercial area provides a gathering place as well as identity for the surrounding urban community which it serves. Lacking the generous open spaces of the two park-based nodes (to be discussed), a market in this location may take on more of a temporary condition - being located in several closed-down side streets once or twice a week, comprised mostly of farmer-brought tables, tents, and produce.



FIGURE 3.25 - Frequency and Distribution of "Mixed-use Retail Nodes" within the Urban South-East Sector

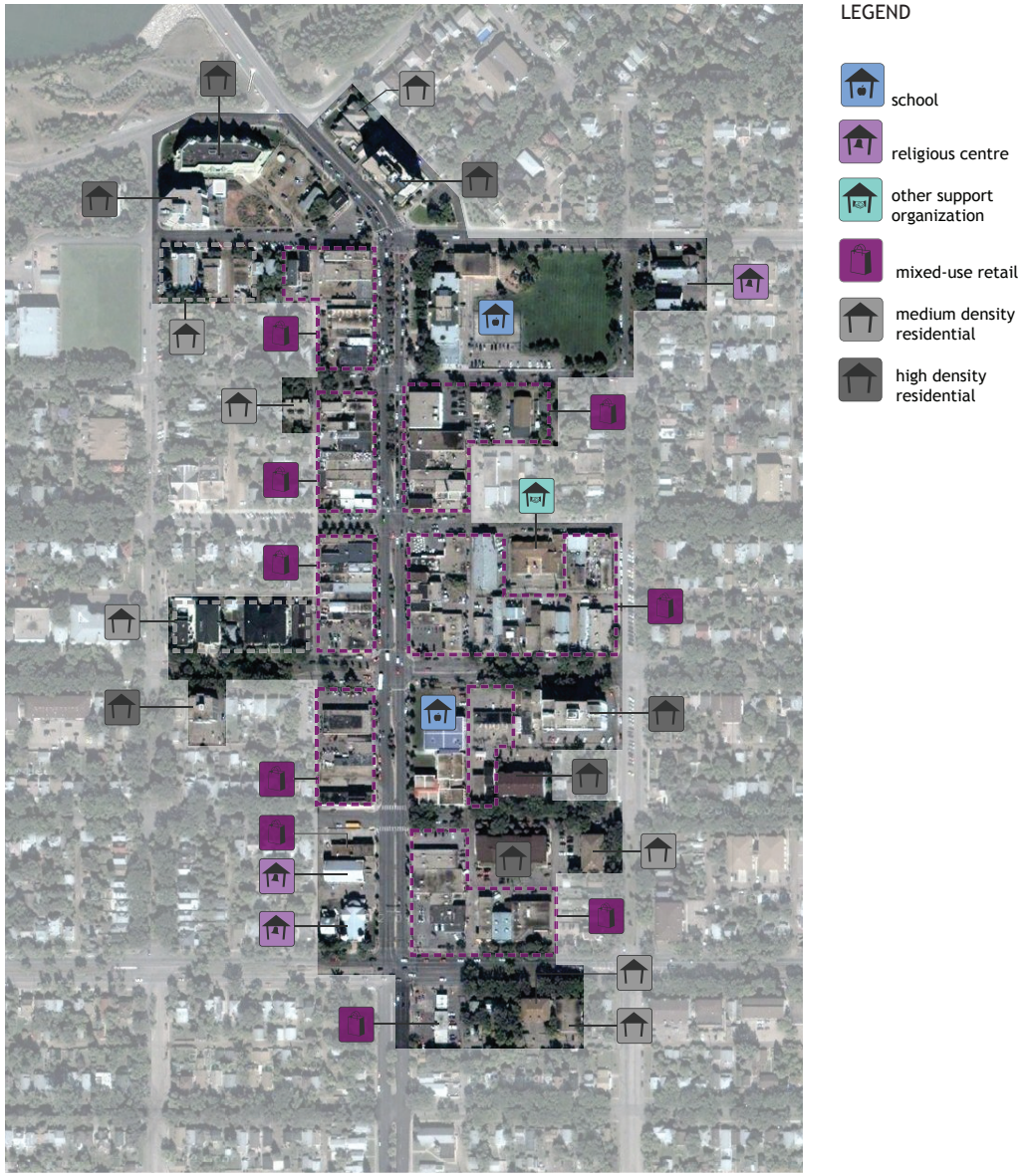


FIGURE 3.26 - The "Mixed-use Retail Node" of Broadway Avenue

Supported by several schools, churches, a significant amount of residential density as well as local cultural icons (such as Broadway Theatre), the mixed-use, small-scale commercial strip of Broadway Avenue acts as a pedestrian-friendly neighbourhood node for its surrounding urban community - an ideal location for the establishment of a neighbourhood farmers' market.

Multiple Main Neighbourhood Park Nodes

After “mixed-use retail nodes”, the next least common type of node identified with in the Sector is the “multiple main neighbourhood park node”. Again, as its name suggests the heart of this type of node is a sprawling park system, which is typically connected not only to many surrounding residential properties but also several community institutions. Not only do these sprawling typically under-utilized parks provide ample opportunity for locating neighbourhood markets, but their connection to schools, churches, other community support organizations provide the opportunity to begin combining the market with community gardens, kitchens, and storage facilities into one larger center for food security and community support. See Figure 3.28 and 3.29.

The “Main Neighbourhood Park Node” of Holliston Park.
(See following page)



FIGURE 3.27 - Frequency and Distribution of “Main Neighbourhood Park Nodes” within the Urban South-East Sector

Main Neighbourhood Park Nodes

The most common type of node then, is what has been called a “main neighbourhood park node”. Supported by at least one (however in the majority of cases by four or more) piece(s) of commercial, residential, or community support facilities, a main neighbourhood park is the heart of this node. (See Appendix Five for full description.) Although some of these parks are smaller than others, some more used than others, the vast majority of these parks are large enough to accommodate a market without compromising any of the current park functions, while bringing together potentially disparate pieces of the urban environment into one larger piece of community-building infrastructure.

And so, simply because it represents the most common type of node condition within the sector, Holliston Park and its surrounding community has been chosen as the urban case study area.



FIGURE 3.28 - Frequency and Distribution of "Multiple Main Neighbourhood Park Nodes" within the Urban South-East Sector



FIGURE 3.29 -The "Multiple Main Neighbourhood Park Node" of Breevort Park

Connecting Breevort Elementary, St. Michaels' Elementary, as well as shared skating rink, toboggan hill and baseball pitch together, Breevort Park North together with Breevort Park South not only connects these pieces into one larger piece of civic infrastructure, this sprawling 19.2 acre public park provides significant opportunity for more intensified use.



FIGURE 3.30 - Holliston Park and schoolyard from 5th Street E.



FIGURE 3.31 - Calvin-Goforth Presbyterian Church showing Holliston Park and Holliston School in background

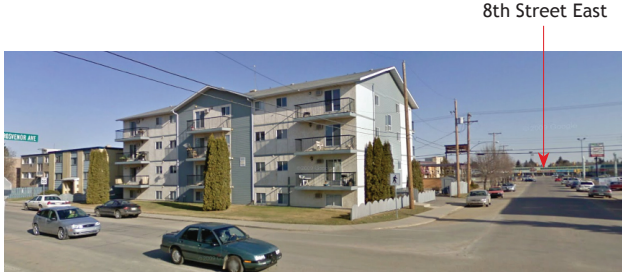


FIGURE 3.32 - Medium density residential units along 7th Street E. buffer the node from the big box strip of 8th Street directly to the north.

3.6 The Node of Holliston Park and Its Surrounding Urban Community: an Introduction

The Node of Holliston Park

Flanked by Holliston Elementary School on the west, the low-income housing complex of Edmund Heights on the north, and several churches on the south; the combined school yard and 5.5 acre Holliston Public Park form the core of the Holliston Park node. Containing an outdoor swimming pool as well as a baseball diamond and skating rink, the park is already a well-used piece of community infrastructure, however this thesis proposes that the further intensification of such an element will not degrade, but rather enhance the vitality and overall use of this public amenity.

In addition to these elements, two additional educational facilities (Sion Middle School to the east and Horizon College & Seminary to the west) as well as a significant amount of medium-density residential units provide additional support to the core area of the node, buffering it from the big box commercial strip of 8th Street East, located directly north.



FIGURE 3.33 - The Node of Holliston Park

Comprised of a 5.5 acre public park, three educational facilities, two churches, and a significant number of medium-density residential units, the Node of Holliston Park is a typical "main neighbourhood park node" and as a result will be used as the site for developing a farmers' market within the Urban South-East Sector.

The Surrounding Urban Community

When centered on the Park itself, a circle with a radius of 800 m stretches approximately 16 blocks in the east-west direction, and 10 blocks in the north-south direction. Major features of the area include the big box strip of 8th Street East to the north, as well as Walter Murray Collegiate in the south-east.

Besides this, six smaller neighbourhood parks, one main neighbourhood park, as well as several churches and community support organizations are also located throughout the area. Taken together, there are about a dozen opportunities for locating community gardens, community storage, community kitchens and the like throughout the area, given these opportunities. Besides this, a quick estimation shows that there are approximately 2,050 residential units* within this 10-minute walking radius.

Since the exact population of the area is difficult to determine, and because the entire sector has relatively even population density, for the purpose of this thesis it is will be assumed that roughly 1/10 of the sector resides in the area - a population of about 4,900 people.

---

*author's estimation based on aerial photography (see source for Figure 3.33) as well Google Maps "street view," 2011. All multiple unit buildings counted as per number of units within building.

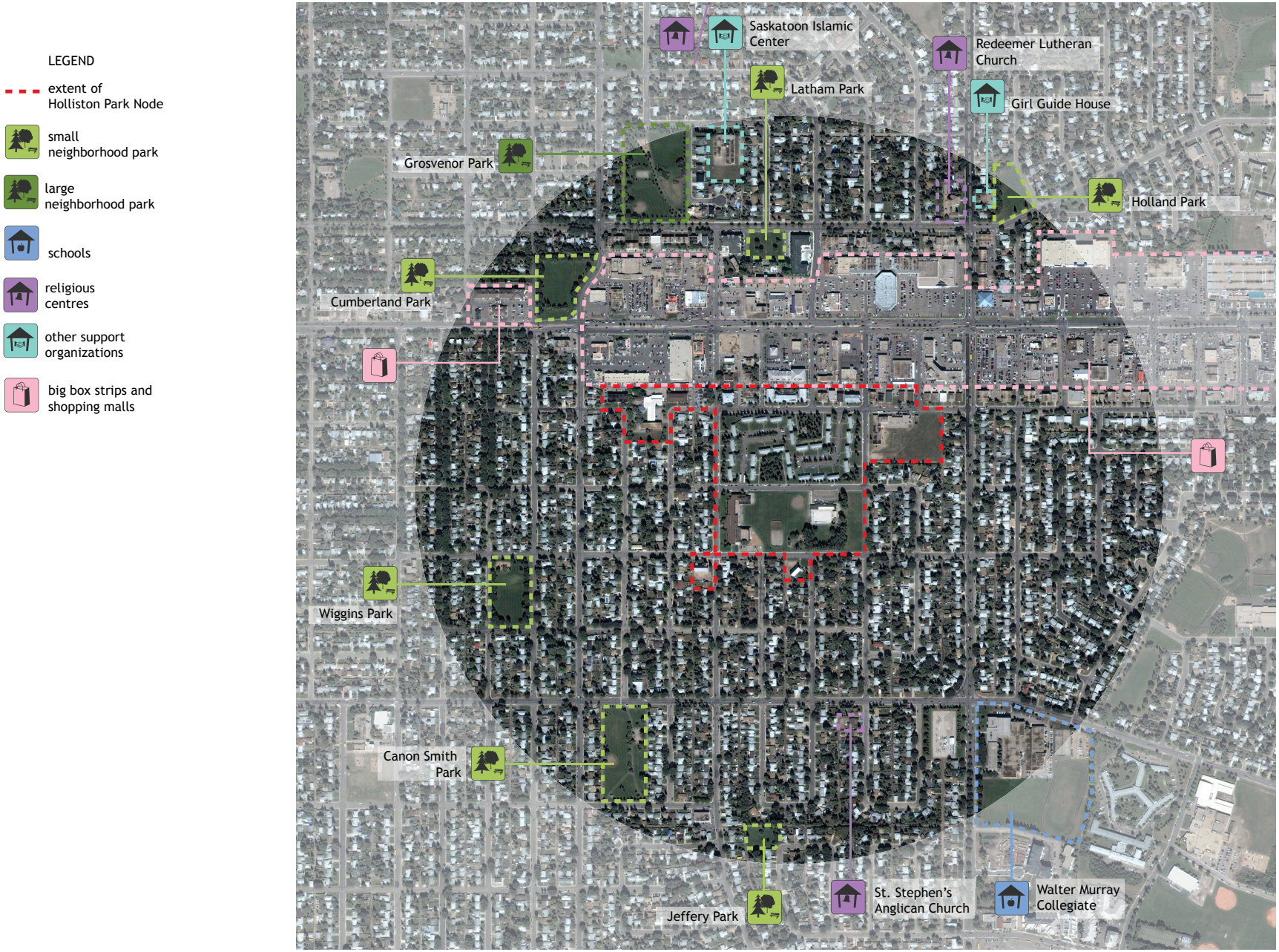


FIGURE 3.34 - The Node of Holliston Park's Surrounding Urban Community

3.7 Preface to the Last Two Chapters: A System for Estimating Required Production and Distribution Capacity

And so, given the identification of the town of Craik and its surrounding 15 km hinterland, together with the node of Holliston Park and its surrounding 800 m urban area as case study areas, the goal of the last two chapters of this thesis will be to investigate what a system comprised of rural production and processing, and urban distribution (in the form of a neighborhood farmers' market) and support could look like for these two areas, respectively.

Considering that the town of Craik and its surrounding rural area covers approximately 1/10 of the rural portion of the sector (therefore representing 1/10 the production capacity), and since Holliston Park and its surrounding urban community contains 1/10 of the urban portion of sector (representing 1/10 the consumption capacity) for the purpose of this thesis, a direct correlation will be made between the system of production developed in Craik (to provide this 1/10,) and the capacity required by a system of distribution developed in the node of Holliston Park to deliver this 1/10 of foodstuffs.

While it is recognized that this is an idealized situation, for the purpose of this thesis it provides a viable framework upon which to estimate the implications of such a system in both areas, given the goal of developing a system capable of delivering 80 percent of the food needs of the entire Sector.

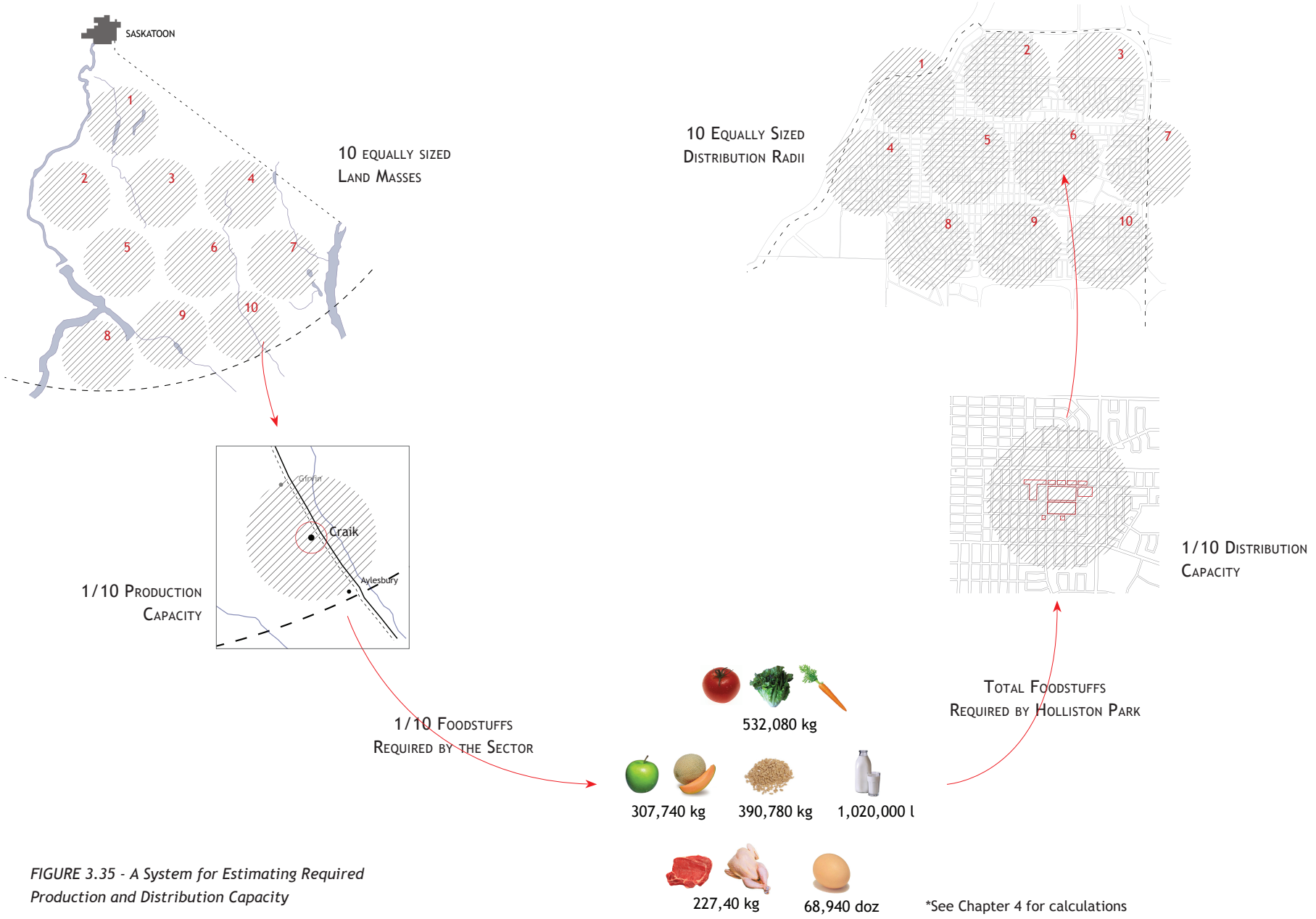


FIGURE 3.35 - A System for Estimating Required Production and Distribution Capacity

Chapter Four

Re-imagining Craik:

Envisioning the Required Capacity of One Rural Community

And so, following three sections (4.1, 4.2, 4.3) dedicated to developing the "system of farms required" in order to produce 1/10 of sector's foodstuffs, the fourth and fifth sections of this chapter imagine what such a system of production (as well as processing/support) could look like if developed within Craik and its surrounding rural hinterland, and speculates as to what the implications of this would be for the social and economic vitality of the area as a whole.

Chapter contents:

4.1 Total Production Required 94

4.2 Production Capacity and Requirements of Developed/Adapted Farm Models 96

4.3 System of Farms Required 104

4.4 Re-imagining Craik: Applying the Developed Production System 106

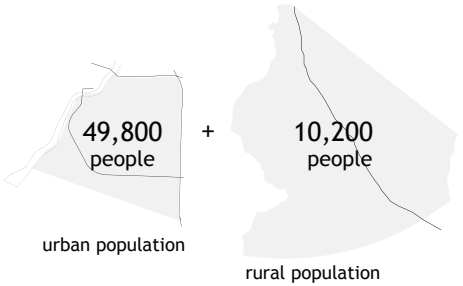
4.5 Re-imagining Craik: A System of Processing/Support 110

4.1 Total Production Required

Given a total sector population of 60,000, and the fact that Craik and its surrounding rural area represents 1/10 of the total land mass (and therefore 1/10 the production capacity) of the entire sector, for the purpose of this thesis, a system of production capable of delivering the foodstuffs required by a population of 6,000 has been identified as the goal. (See numbers 1-3 of Figure 4.1)

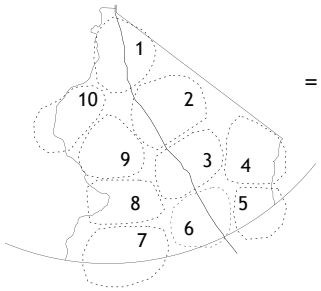
Based on this, using Statistics Canada figures regarding the consumption of a typical Canadian (excluding tropical fruit, fish, sweets and syrups, as noted in Section 1.1) the adjacent chart illustrates just how much food would need to be produced within the town of Craik and its surrounding rural community in order to be representative of a Sector-wide system capable of producing all 80 percent.

1. Number of Consumers:



= 60, 000 consumers

2. Number of Producer Communities:



= 10 communities

3. Each community responsible for feeding:

$$\frac{\text{60, 000 consumers}}{\text{10 communities}} = \text{6,000 people}$$

4. Production Requirements of one rural community :

Consumption per capita	x 6,000	
37.55 kg	225 300 kg	temperate fruit
13.74 kg	82 440 kg	annual fruit
40.31 kg	241 860 kg	root vegetables
25.08 kg	150 480 kg	cool-weather vegetables
23.29 kg	139 740 kg	warm-weather vegetables
65.13 kg	390 780 kg	cereals, pulses and nuts
170 litres	1 020 000 l	dairy products
24.5 kg	147 000 kg	red meat
13.4 kg	80 400 kg	poultry
11.49 doz	68 940 doz	eggs

FIGURE 4.1 - Production Capacity Required per Rural Community if in fact the system was required to deliver 80 percent of the entire sector's foodstuffs.

4.2 Production Capacity and Requirements of Developed/Adapted Farm Models

In order to determine a system of farms capable of delivering this amount of food and what the requirements of these farms would be (i.e. amount of land and operators required) the following section performs a kind of "adaptation" on all seven farms identified in Section 2.1.

Chosen for their ability to act as formidable models of environmentally and economically sustainable agriculture, many have been developed in situations unlike the Saskatchewan context. And so, taking into account differences in overall climate, soil conditions, rainfall, length of growing season, etc., the following section attempts to "adapt" the models previously presented for the Saskatchewan context.

It should be noted that these are not scientific calculations. Without significant agricultural science experience, it is difficult to say exactly how much an agricultural system could produce in a different climate, with different soils, temperature, and rainfall. However, for the purpose of this thesis an attempt has been made to address the most crucial of these issues for all seven model types, thus arriving at a system of farms that, when applied to the Saskatchewan context would be able to deliver a good diversity of foodstuffs in all of the categories previously identified.



Production Type 1:
Small-Plot Intensive Vegetable Production

System Summary of Model Farm

land req'd: 0.5 a

operators req'd

annual yield: 3540 kg; 2870 kg; 440 kg

net income: $$

$50,000

Wally's Urban Market Garden
Saskatoon, Saskatchewan.

From 0.5 acres, Wally Satzewich and partner Gail Vandersteen are able to harvest over 7,000 kg of fresh vegetables, even within the short growing season of Saskatoon. Sold direct to consumers from early June to mid September, the Satzewich's estimate a gross income of $54,000/yr, while very few operating costs and expenses can leave up to $50,000 of that as income.

Adapted for Saskatchewan

land req'd: 0.5 a

operators req'd

annual yield: 3540 kg; 3640 kg

net income: $$

$50,000

Developed in Saskatoon, no adjustments need to be made to the model in order to account for climatic differences. However, after some experimentation with warm-weather crops it is believed that Mr. Satzewich has removed them from his crop repertoire, growing root vegetables in their place. Thus, the SPIN® farmer in the developed model will do the same. As a result, the final version of this model requires two operators to produce 3,540 kg of cool-weather vegetables and 3,640 kg of root vegetables from 0.5 acres of urban backyard plots, generating approximately $50,000/yr for the small-scale farmer. (See Appendix Two and Three for further details and diagrams.)



Production Type 2:
Protected Intensive Vegetable Production

System Summary of Model Farm

land req'd: 1.5 a

operators req'd

annual yield: 3900 kg, 3790kg

net income: $$ $80,000

Four-Season Farm
Harborside, Maine

On 1.5 acres in Harborside, Maine, Eliot and his wife Barbara are able to harvest 7,700 kg of fresh winter vegetables from October through to May. Sold at farmer's markets exclusively on the "backside of the calendar" the couple is able to gross $100,000 US/yr.

Adapted for Saskatchewan

The "Early" Farmer

land req'd: 1.1 a

operators req'd

annual yield: 3920 kg, 1940 kg

net income: $$ $60,000

The "Late" Farmer

land req'd: 2.1 a

operators req'd

annual yield: 7580 kg, 4190 kg, 2180 kg

net income: $$ $60,000

While it may be unrealistic to assume a harvest of winter vegetables all year long in southern Saskatchewan, using Eliot's calculations it would still be possible to extend the growing season by at least four weeks on either side of the calendar. With this in mind, two models have been developed - *The "Early" Farmer*, and *The "Late" Farmer.*

The "Early" Farmer, it is imagined capitalizes on the early start made possible by greenhouse production by bringing cold weather vegetables to market as early as the end of March, while the "Late" Farmer uses the extended season to bring warm weather fruits and vegetables to market well into November and even December. And although the "Late" Farmer requires more land and takes more vegetables to market, it is estimated that both systems have similar workloads, as well as income levels as the Coleman's. (See Appendix Two and Three for further details and diagrams.)



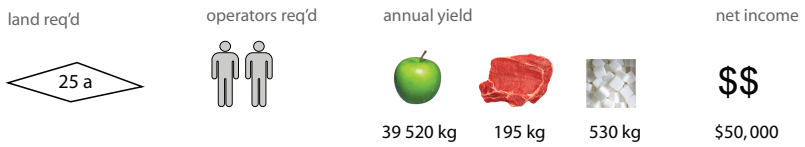
Production Type 3:
Integrated Holistic Fruit and Animal Production

System Summary of Model Farm

n/a

While several farms utilizing holistic fruit production methods were discovered throughout this research, of the two farms thoroughly investigated, fruit production only accounted for a small portion of the farm's production capacity and income (as described in Section 2.1). Thus, a model for "Integrated Holistic Fruit and Animal Production" has been developed specifically for the Prairie context.

System Summary of Developed Saskatchewan Model



Protected by a shelterbelt of native trees and bushes, it is estimated that the Saskatchewan holistic fruit grower is able to produce close to 40,000 kg of temperate fruit – including apples, Saskatoon berries, raspberries, strawberries, rhubarb, choke cherries, lingonberries and sour cherries – as well as 450 kg of honey, 93 liters of maple syrup and 195 kg of lamb, from his 25-acre farm every year. Sold direct to customers either through on-farm or farmers' market sales, it is expected that such a farm could gross over $100,000/year. And with minimal operating costs and required off-farm inputs, it is estimated that such a farm could support either two individuals living modestly, or one farm family living a little more comfortably. (See Appendix Two and Three for further details and diagrams.)



Production Type 4:
Small-scale Diverse Grains and Cereals

System Summary of Model Farm

land req'd: 30 a

operators req'd: 1

annual yield: 6,800 kg

net income: $$

$30,000 US

Windborne Farm
Scott Valley, California

Using small-scale diverse methods, Jennifer Greene is able to harvest 15,000 lbs of grains, beans and seeds, from her 30 acre farm in northern California almost solely, every year. Processed on-site into flour, cornmeal, pancake, and cereal mixes, Greene is able to sell direct to customers via a 90-member CSA program, from which she is able to net approximately $30,000 US/yr.

Adapted for Saskatchewan

land req'd: 60 a

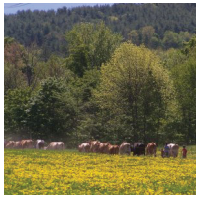
operators req'd: 2

annual yield: 13,600 kg

net income: $$$

$50,000 US

Although there are significant differences in climate between California and Saskatchewan, using general figures presented by Gene Logsdon in his book *Small-scale Grain Raising* it appears as though a figure of 15,000 lbs (6,800 kg) of grains for a 30 acre plot is very reasonable (less than one-sixth of what he says is possible) (Logsdon 1977, 8), and so it will be assumed that Greene's yields are possible using similar methods on the Prairies. In order to account for the fact that it is quite uncommon for any farm to be solely run by one individual however, the model has been doubled in order to support two individuals comfortably. And although at this scale animal traction may become inefficient, small "community-scaled" equipment is still quite feasible, keeping overhead costs and energy expenses very minimal. It is estimated that $50,000/yr can be generated.



Production Type 5:
Closed-loop Dairy Production

System Summary of Model Farm

land req'd	operators req'd	annual yield	net income
300 a		298, 300 litres	$$$ unavail.

RockBottom Farm and Strafford Organic Creamery
Strafford, Vermont

On 300 acres in central Vermont, Earl Ransom and his family are able to produce 13,000 lbs of milk from a 50-head herd of Guernseys every week. Pasteurized and bottled (or processed into ice cream, eggnog, etc.) directly on the farm, the Ransoms sell their milk directly to between 25 and 30 local grocery and natural food stores where it sells for three times that of regular commodity milk - enough to not only support Earl and his family but 6 other full time and 3 part-time employees (including those employed in the creamery as well).

Adapted for Saskatchewan

land req'd	operators req'd	annual yield	net income
300 a		298, 300 litres	$$$ unavail.

Although figures from a similar farm in the Saskatchewan context were unavailable for comparison, data from a small-scale organic dairy farm in southern Ontario indicate that it is reasonable to assume that the requirements and yields of *RockBottom Farm* are achievable in a variety of other contexts (Macey 2000, 82), thus, they will be used directly in the Saskatchewan model. And although it would be possible for a significantly smaller farm to support an individual or a family, the size of the Ransom's operation will be maintained in order that the addition of an on-farm creamery remains feasible.



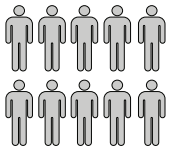
Production Type 6:
Natural-systems Mixed Livestock Production

System Summary of Model Farm

land req'd

550 a

operators req'd



annual yield


23 625 kg


35 700 kg


30 000 doz

net income

$$

unavail.

Polyface Farms Inc.
Shenandoah Valley, Virginia

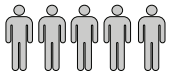
From only 550 acres, the Salatin's are able to produce 25,000 lbs beef, 25,000 lbs pork, 500 rabbits, 10,000 broilers, 800 stewing hens, 1,000 turkeys, and 30,000 doz. eggs every year. Sold from over 50 venues, Polyface is able to gross close to 1 million dollars a year. However, requiring 10 full-time employees as well as a significant amount of infrastructure to operate, it is estimated that an income of $50 to $75,000/yr. is possible.

Adapted for Saskatchewan

land req'd

550 a

operators req'd



annual yield


11 810 kg


17 850 kg


15 000 doz

net income

$$

unavail.

On average, the Shenandoah Valley receives two and a half times more rain, and boasts an almost 70-day longer growing season than southern Saskatchewan. And so, for a conservative estimate, the acreage required for such a system on the Prairies has been doubled. This seems reasonable when compared to Al Bennet's farm near Meacham, SK. Using a similar grazing strategy, Al is able to calve 120 animals on 1400 acres of native prairie grasses a year (twice as many as is being suggested, however Mr. Bennet exclusively raises cattle, so the acreage has been increased). (Bennet 2008) And in order to account for the fact that *Polyface* has grown to a size which requires 10 full-time employees to operate, the model has been divided in half, requiring and supporting only 5 similarly-minded operators, which may be a more likely partnership at this time.



Production Type 7:
Natural-systems Bison Production

System Summary of Model Farm

land req'd: 1840 a

operators req'd

annual yield: 25 000 kg

net income: $$ $50,000

Sagehill Buffalo Ranch
Cudworth, Saskatchewan

With the help of one full-time employee, Josef Saxinger is able to raise 700 head of bison on 1840 acres in southern Saskatchewan. Taking 100 beasts to slaughter every year, the farm produces 27,000 kg (60,000 lbs) of bison meat every year, for an estimated total income of $50,000/person/yr.

Adapted for Saskatchewan

land req'd: 1840 a

operators req'd

annual yield: 25 000 kg

net income: $$ $50,000

Because bison naturally range over hundreds of thousands of acres or more, in his book *Bringing Back the Buffalo*, Ernest Callenbach reports that the rotational grazing system used by natural-systems bison ranchers works best with large herds (2,000 to 5,000 head) on tens of thousands if not hundreds of thousands of acres. (Callenbach 2000, 117) However, because land is so subdivided today, it is unlikely that any one farmer would have access to such vast tracts of land, or capital to buy such a large herd. Thus, for the purpose of this thesis, the figures of Josef Saxinger's *Sagehill Buffalo Ranch* will be used directly as a model.

4.3 System of Farms Required

And so, based on the production capacities of the previously outlined models (after having been adjusted for the Saskatchewan context) it has been discovered that a system of 114 farms (see Figure 4.2 for composition) would not only be able to provide 6,000 people with 80 percent of their annual foodstuffs, but provide a good diversity of foodstuffs in all identified food groups as well.

It is worth noting that while such a composition of farms does not provide quite enough annual fruit (e.g. melons) as is typical according to Statistics Canada, the model compensates for this by producing more temperate fruit (e.g. apples, berries, pitted fruits) which, given Saskatchewan's climate may actually be more appropriate.



FIGURE 4.2 - System of Farms Required in order to Provide 6,000 Prairie residents with 80 percent of their Year-round Food Supply

4.4 Re-imagining Craik and its Surrounding 15 km Hinterland: Applying the Developed Production System

And so, in addition to illustrating what the previously outlined production system could look if developed in and around the town of Craik, the following section also discusses what some of the implications of this would be in terms of both economic as well as social vitality of the town and surrounding rural community.

Small-scale Vegetable Production: Adding 107 People, requiring 82 acres in the near Vicinity of Craik

Requiring only 0.5 to 2.1 acres each, and benefitting significantly from the protected micro-climate of an urban environment, it is imagined that all three types of vegetable production - SPIN®, "Early" Protected Intensive, and "Late" Protected Intensive, would all be accomplished in and around the town itself. See Figure 4.4.

While all 19 of the required SPIN® farms could easily be accommodated on available land within town limits, it has been imagined that in order to accommodate the other 45 "Protected Intensive" Vegetable Farms in a way that develops an amenable urban fabric, the town would need to add approximately 175 acres to their total land base. At $550/acre (typical 2011 pricing) this comes to $96,250. If farmers were charged $1,000 an acre, the largest farm would still only be $2,100 while the town would be able to recover $82,000 (85 percent) of its costs. It seems that $14,500 is a reasonable investment given that such development would allow for the addition of over 100 individuals and their families to this town of 400. See Figure 4.3.

Production Summary, small-scale vegetable production

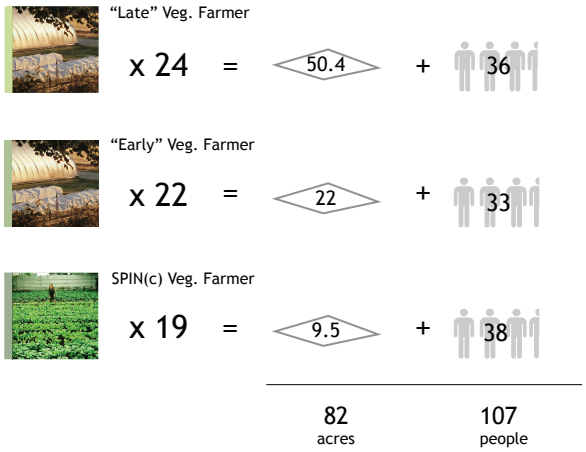


FIGURE 4.3 - Production Summary 1



FIGURE 4.4 - Potential Arrangement of Vegetable Farms in and around the town of Craik

Production Summary, five largest types of farms

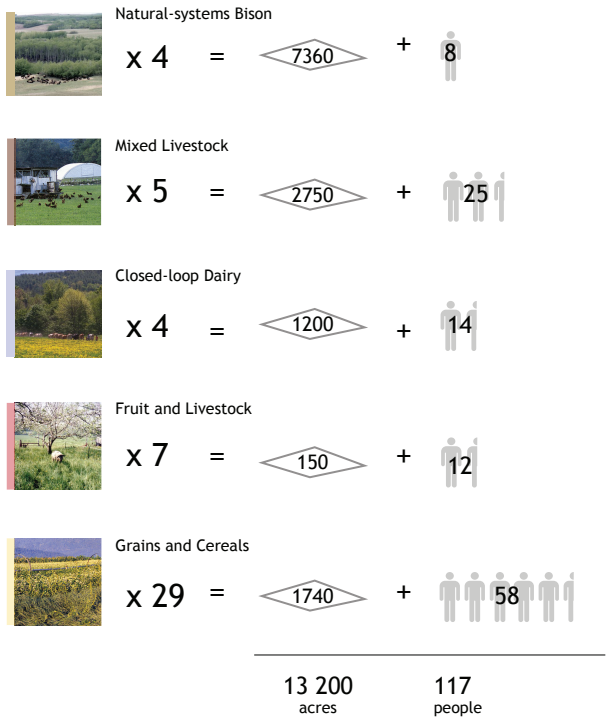


FIGURE 4.5 - Production Summary 2

Natural-systems-based Bison, Mixed-livestock, Dairy, Fruit and Livestock, and Grains and Cereals Production: Adding 117 farmers, requiring 13,200 acres in the 15 km Hinterland

Requiring a land base of 25 acres each or more, it is imagined that the five largest farm models would be accommodated on land outside Craik's town limits. Taken together, these 49 farms would require approximately 13,200 acres (53.4 km^2) - a mere 7.5 percent of the land mass included within the case study area. As mapped, 10,560 acres of this 13,000 has been accommodated on lands that are currently in cultivation: all of land required for Grains and Cereals and Dairy farms; most of the land utilized for Mixed-Livestock and Bison; with the exception being Holistic Fruit and Animal farms being located on well-watered gently sloping banks of the Arm River.

While it is possible that a far greater amount of this 13,200 acres could be accommodated on hilly or degraded lands (e.g. the majority of Mixed Livestock and Bison farms), also considered in this proposal was the utilization of such farms to provide buffer spaces between the still existing high input fields of industrial agriculture and the most sensitive, fragile lands in the area. By recovering currently cultivated industrial lands near edges of rivers and ravines, it is imagined that the less intensive use of these lands would encourage the return of some ravine lands to their native state - supporting the reestablishment of wild flora and fauna within the area, benefitting natural-systems-based as well as conventional farmers both.

Considering that the average farm size in Saskatchewan today is 1,450 acres (Statistics Canada, 2006) in order to accommodate these 49 farms, the equivalent of 9 industrial farms would be lost. Considering that each one of these larger farms typically requires two full-time people to operate, in total, about 100 full-time people (and their families) would be added to the surrounding rural area if such a system were to become a reality.

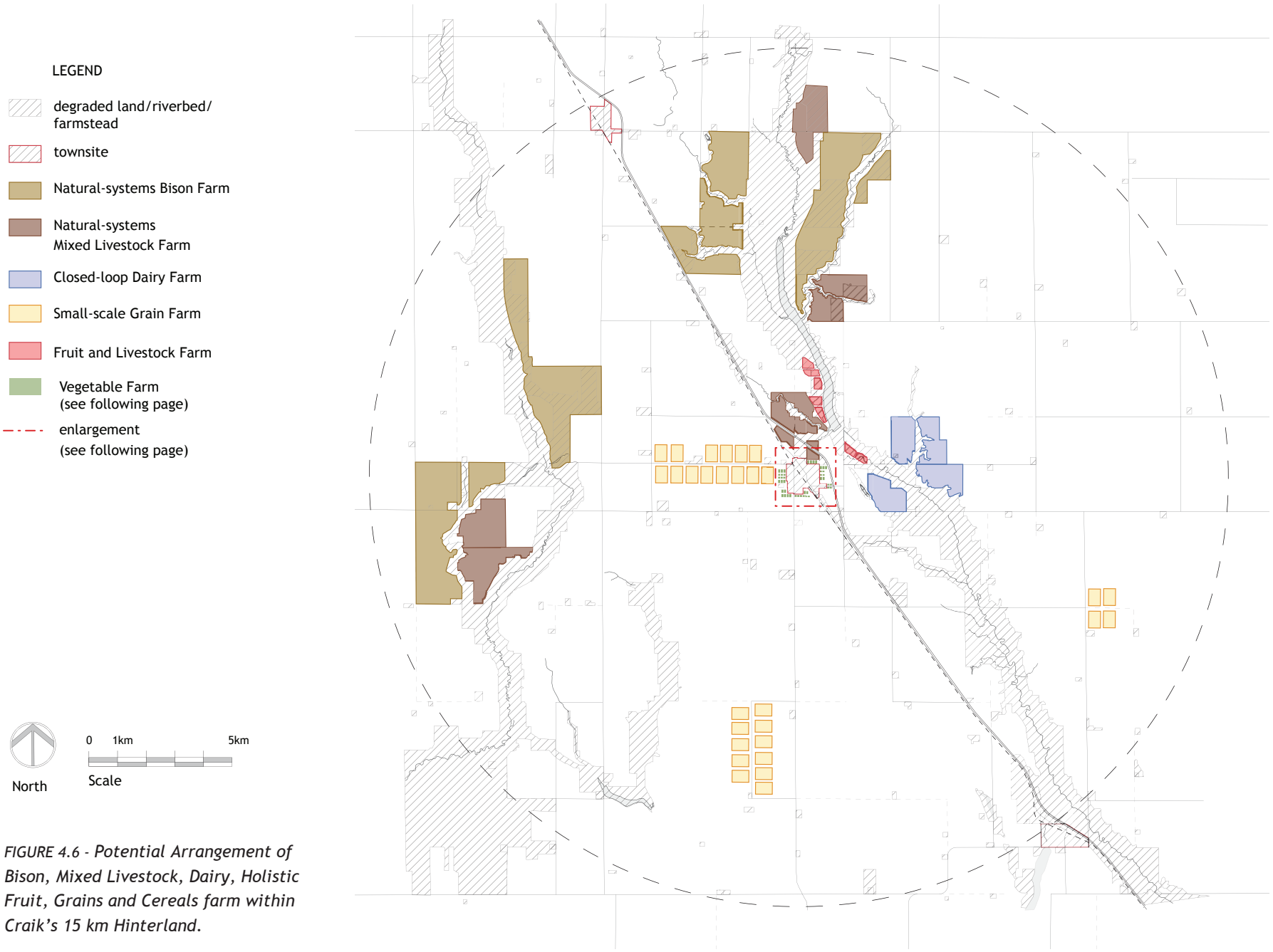


FIGURE 4.6 - Potential Arrangement of Bison, Mixed Livestock, Dairy, Holistic Fruit, Grains and Cereals farm within Craik's 15 km Hinterland.

4.5 Re-imagining Craik and its Surrounding 15 km Hinterland: A system of Small-scale Processing/Support

Small-scale production is not the only piece of the system imagined to be located in the rural area, however. Processing/support infrastructure is also part of the imagined scheme. The following section outlines several opportunities/strategies for developing such facilities throughout the town of Craik such that, not only could they provide the infrastructure required to build the capacity of the associated rural producers, but provide the opportunity for building socially prosperous rural communities as well.

Community Greenhouses and Garden plots: Bridging Potentially Disparate Rural and Urban Elements

Although some areas of town (east of the tracks) are sparse enough that significantly sized backyards, side yards and nearby abandoned lots could be utilized by residents (in addition to the identified producers) as growing spaces, in many areas (west part of town) such spaces are limited. And so, this thesis is proposing that several community greenhouses and growing plots be established on the west side of town.

Grouped together and located in between the existing town fabric and many of the newly proposed one- and two-acre vegetable farms (see Figure 4.8), such facilities would not only help provide food security to residents that may otherwise not have it, but they could also provide a common ground upon which town residents, existing farmers, new farmers and school children alike can get together in order to discuss/share/learn from each other, helping to build a true sense of "community" between all parties as well.



FIGURE 4.7 - Bridging gaps: Community Greenhouses and Gardens

The grouping of fourteen large community plots and several community greenhouses provide infrastructure not only for building food security, but building "community" as well.

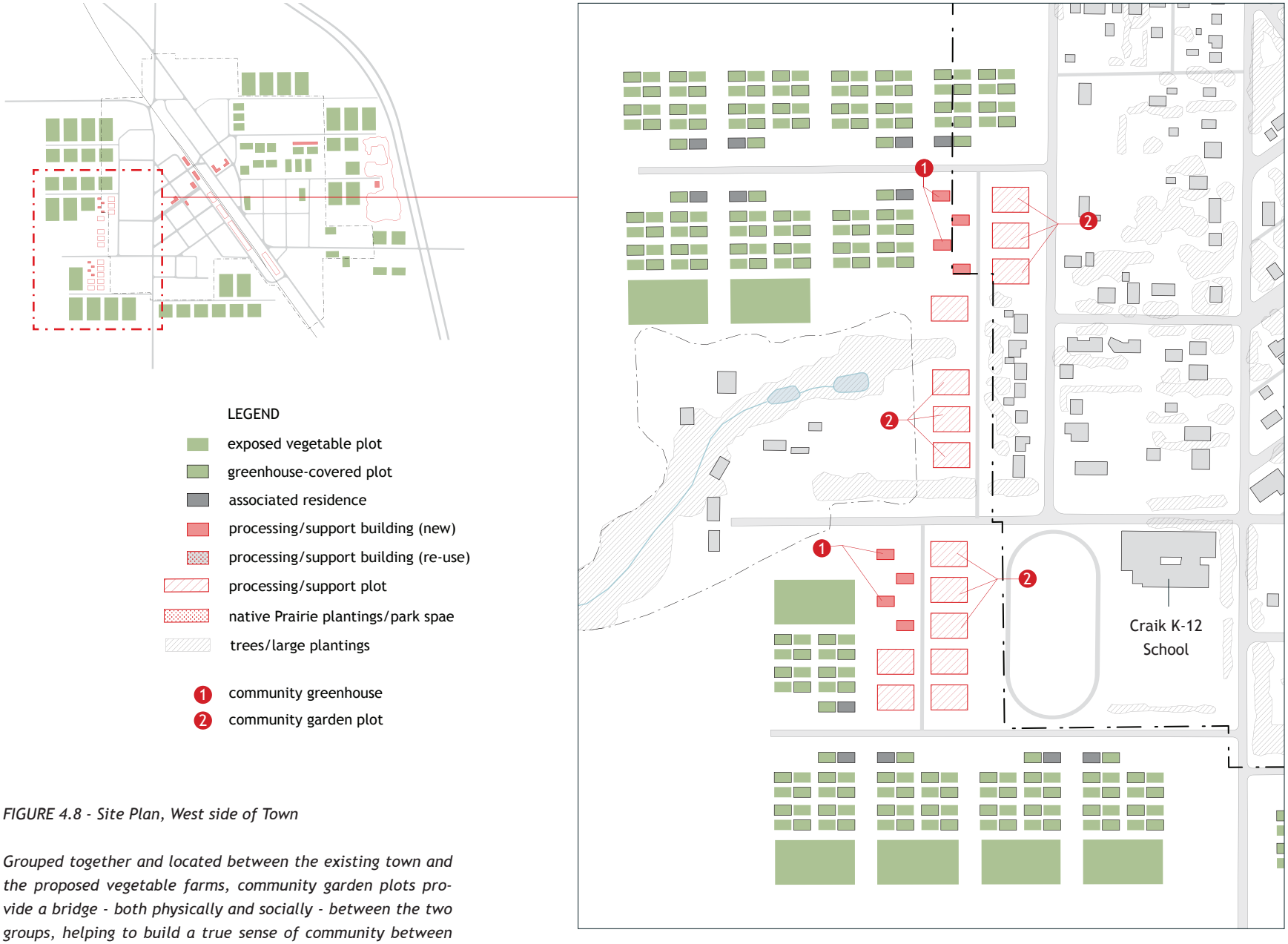


FIGURE 4.8 - Site Plan, West side of Town

Grouped together and located between the existing town and the proposed vegetable farms, community garden plots provide a bridge - both physically and socially - between the two groups, helping to build a true sense of community between all parties.



FIGURE 4.9 - Building re-use and in-fill on Main Street

A new pavilion structure in-fills several currently vacant lots near the heart of Craik's Main Street, while the re-purposing of the old Town Hall as a "rural resource center" not only preserves this important artifact, but creates a powerful symbol of the renewed commercial and cultural vitality of the town as well.

Light Processing, Education and Distribution on Main Street: Re-establishing Commercial Vitality and Cultural Importance

Although still home to many essential businesses and services (e.g. the town hardware store, grocery store, post office, bank and community hall), decades of decline have left Craik's town center marked with empty lots and buildings. Thus, this thesis is proposing that several key commercial and educational components: a Farmers' market, a rural resource center, a CSA assembly area, and a community-scaled bakery; all be developed along this strip in order to support the commercial and cultural vitality of this historically important area.

Besides in-filling empty lots with new construction (both the Farmers' Market pavilion and the community bakery have been envisioned as new structures filling key empty spaces in the streetscape - see Figure 4.10), it is being proposed that several of these components (i.e. the rural resource center and the CSA assembly area) be accommodated within existing under-utilized, yet historically important buildings: the old town hall and what is believed to be an old bank building (both shown previously, in Figure 3.19). By reusing these currently vacant (or nearly vacant) buildings, not only are costs minimized and important historic artifacts preserved, but a powerful symbol of the commercial and cultural revitalization of the town is also created.



FIGURE 4.10 - Site Plan, Main Street

By locating key commercial and educational components (i.e. a Farmers' market, a rural resource center, a CSA assembly center, and a community bakery) along the town's Main Street, it is hoped that a renewed sense of commercial and cultural vitality be brought to this historically and contemporarily important area.

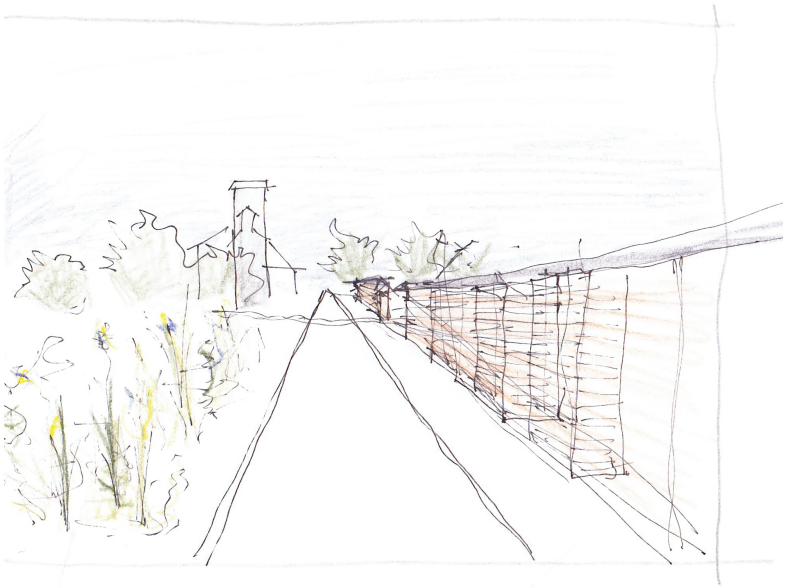


FIGURE 4.11 - Small-scale Grain Storage and Test Plots along the Tracks

Besides being conveniently located for farmers and bakers alike, a row of community-scaled grain storage bins along the tracks north of Main Street not only makes a powerful statement regarding a new sensibility regarding the appropriate scale of grain agriculture on the Prairies, but its open-air nature affords a community space for rural and urban community members alike.

Small-scale Grain Storage and Test Plots: Functionality and Symbolism along the Tracks

Once filled with seven rail-side grain elevators, Craik's "elevator row" was the symbol of a prosperous, booming Prairie town. Today, with only one remaining, a significant physical as well as psychological gap has been left. This thesis proposes that the development of small-scale grains and cereals storage on the north side, together with a series of test plots and native Prairie plantings on the south side (see Figure 4.12) would not only utilize this space efficiently, but also act as a powerful symbol of a renewed relationship between rural Prairie communities and a much smaller-scale, community-based, rather than commodity-driven, agriculture.

Located in close proximity to both the proposed bakery as well as the existing grain elevator, such facilities would be extremely accessible to farmers, bakers, and even the general public. For, unlike historic rail-side grain elevators, these would be human-scaled, open-air spaces, developed with integrated community gathering spaces in order that these structures too can become a valuable element of the town fabric. Similarly, along the tracks on the south side of the elevator, test plots of vegetables, legumes, cereals, and even fruit crops would be interspersed with native Prairie plantings and park space in order that in addition to providing key educational information for aspiring farmers, the space could also be utilized as an informal meeting place for rural and urban community members alike.



FIGURE 4.12 - Site Plan, along the Tracks

Interspersed with native Prairie plantings and park space, small-scale grain storage facilities together with vegetable, grain, legume and even fruit crop test plots offers a vision of the kind of agriculture required to establish truly prosperous rural communities on the Canadian Prairies.

The Community Creamery and Butcher Shop: Extending Main Street to the East Side of Town

Although not necessarily appropriate on the town's Main Street itself (due to heavy truck traffic and potential waste requirements), it is imagined that heavier small-scale processing facilities such as a community creamery and abattoir (or the stationary facilities required to support a mobile abattoir - e.g. cutting, freezing, and wrapping facilities) could act as a kind of extension of Main Street on the east side of the tracks.

Buffered by several industrial buildings on the north, commercial buildings to the east and south, and the grain elevator to the west, both facilities would have significant distance from any residential units, while orienting the buildings such that their retail portions face and create a courtyard onto Railway Street, it is imagined that this currently under-utilized roadway could be transformed into a lively community space as well.



FIGURE 4.13 - Extending Main Street to the East Side of Town

Oriented such that their retail components face Railway Street, it is imagined that the community spaces of the creamery and butcher shop could spill out onto the roadway, transforming the once dead space into a lively community gathering space.



FIGURE 4.14 - Site Plan, East of the Tracks.

Buffered by industrial and commercial buildings on all sides, a community creamery and butcher shop located to the east of the elevator along Railway Street would extend the commercial character of Main Street to the east part of town while preserving the industrial/commercial character of the area.



FIGURE 4.15 - Community Fruit Growing on the Eastern Edge of Town

A community orchard combined with an indoor/outdoor pavilion outfitted with fruit pressing and preserving equipment not only provides a much needed service to area small-scale fruit farmers, but also provides a significant amenity for the entire community - the opportunity to become involved in fruit production, and a great public space especially for things such as cider festivals.

A Community Orchard, Fruit Pressing Pavilion and Root Storage: Buffering Roads and Building Bridges on the Eastern Edge of Town

Not unlike the community greenhouses and garden plots on the western edge of town, a community orchard together with a fruit pressing pavilion on the east provides an opportunity for the coming together of both rural and urban community members in order to share and enjoy local food, while the orchard itself creates a physical buffer between the newly expanded town and Highway 11.

Planted to a variety of cold-hardy apples, cherries, pears, plums, and apricots (see Appendix One) the community orchard would not only contribute to the town's food security, it could also act as field trial for new cultivars from the University of Saskatchewan (for instance), while combined with an indoor/outdoor fruit processing pavilion could provide a great platform for community building activities. Outfitted with small inexpensive fruit pressing and processing equipment (e.g. water-powered cider press, or even a hand-screw press) this pavilion could provide small-scale farmers the equipment they need to add value to their products while creating an opportunity to bring everyone together for things such as apple cider festivals, or even haskap wine-making events.

In addition to the orchard and fruit pressing pavilion, this thesis also proposes that community outdoor root vegetable storage facilities are also located on the east side of town. Adjacent from the town recreation field and surrounded by proposed vegetables farms, such a location is extremely accessible to farmers, while out-of-the-way of everyday traffic in order to minimize the vegetables' exposure to dust and dirt.



FIGURE 4.16 - Site Plan, Eastern Edge of Town

A community orchard and its associated fruit processing pavilion buffers the town from Highway 11 while providing an amazing public amenity space. The nearby outdoor root storage is a significant distance from the town's main traffic, while still very accessible to all of the town's vegetable farmers.

Chapter Five

Market(s) in the Park:

An Evolving System for Holliston (and Breevort) Parks

In addition to rural production and processing/support facilities, the system for the South-East Sector (as outlined in Section 3.1) also includes urban distribution (in the form of neighborhood farmers' markets) and community support facilities. And although due to time restrictions the community support components of the proposal were unable to be realized, the goal of the final chapter of the thesis has been to imagine a market system for the node of Holliston as well as Breevort Park.

An Evolving System

Although consumer capacity for buying and eating local foods in the node of Holliston Park (as well as every other community in the sector) *is* in fact growing, it is recognized that currently, building a market of the capacity required to accommodate enough vendors to be able to deliver 80 percent of the community's year-round supply of foodstuffs may not yet be practical, for there is neither the consumer demand nor producer capacity to back this up.

And so, the goal of the final chapter of this thesis was to develop a market system for the node of Holliston Park that could start small, with very minimal infrastructure and/or investment, and then as both producer and consumer interest as well as civic government support for such a project began to grow, increase in both capacity and permanence, to the point that it would be able to accommodate both the vendors and foodstuffs required to provide the surrounding community with the aforementioned food supply.

In order to do this, the first section of the final chapter (see adjacent table of contents) is comprised of several parts:

a) an introduction to the immediate site of Holliston Park,
b) an introduction to the “kit of market parts” that will be used to develop the system,
c) the development of a set of typologies regarding the “market function components” of that previously introduced “kit of market parts”, and
d) the development of a market system for the node of Holliston Park using the previously developed elements and typologies.

In addition to this, the second part of the chapter (Section 5.2) illustrates through a more schematically rendered market design for Breevort Park, how such as system could also be applied in a situation where producer and consumer capacity are sufficient enough to build a full-sized market from the outset, however lacking sufficient monetary support, an incremental capital investment model can be utilized in order to increase the infrastructure of the market system in its entirety over several years.

Following this, the chapter concludes with a quick study investigating the capacity of the other eight previously identified urban nodes (see Section 3.4) to accommodate a market of similar size and layout.

Chapter contents:

5.1 A Market for Holliston Park 124

5.1_a The Site 124
5.1_b A Kit of Market Parts 126
5.1_c Elaboration/Development of "Market Function Components" 128
5.1_d The Developed System 147

5.2 A Market for Breevort Park 175

5.2_a The Site 176
5.2_b The Developed System 178
5.2_c Potential Evolution 184

5.3 Confirming the Capacity of the Other Eight Nodes 190

5.1 A Market for Holliston Park

Identified in Chapter 3 as the main urban case study area, the node of Holliston Park will be utilized as the primary site for which a market system will be designed. This is not to say that the system cannot be applied in other manifestations to other nodes. And in fact, by presenting the system as a "kit of market parts" (see Section 5.1_b and 5.1_c) it is hoped that this remains a strong possibility.

5.1_a The Market Site

Covering 5.5 acres and including a significant number of recreational and educational facilities, in order to accommodate a market within the node of Holliston Park, some adjustments will have to be made.

With key factors being visual as well as vehicular accessibility of the site, the disruption of as few existing facilities as possible, and the maintenance of a significant buffer space between the site and the school (in order to not encroach on commonly used play space), the area bounded by the existing skating rink in the west, pool in the north, and 3rd street in the south has been chosen as an ideal location.

By relocating several minor facilities that currently exist in that location (i.e. the children's splash-pad and tobogganing hill) to other under-utilized areas of the park, not only is a suitable market site is achieved, but all of the park's previously established recreational amenities are also able to be maintained.



FIGURE 5.1 - Holliston Park Market Site Plan

Bounded by an existing skating rink in the west, George Ward Pool in the North, a mature stand of trees on the east, and 3rd Street in the south, the chosen market site not only ensures that all of the parks major recreational facilities remain intact, but excellent visual as well as vehicular access is also afforded.

5.1_b A Kit of Market Parts

Located in a park setting, there are many more elements than just “Market Function Components” (see Kit Element #1) that can and will be used to build spaces suitable for producers and consumers to interact in. Ground surface materials (Kit Element #2) together with public amenity features such as benches, picnic table and community garden plots (Kit Element #3) can all be used to develop spaces that are not only usable as market spaces, but as great public spaces as well.

There also exists the opportunity to develop such market spaces in conjunction with existing or new recreational facilities in order to “double-up” functions in order that both parties benefit. Market vendor parking, for instance, can be planned such that during off-market hours, hard-surfaced areas can be used with portable or retractable nets in order to function as basketball courts or ball hockey fields. Similarly, by outfitting existing outdoor skating rinks with removable sidewalls it becomes possible to utilize the otherwise unused hard-surfaced area in the summer months as overflow vendor space, tennis courts, or even a skateboard park.

And so, taken together, these elements have been developed into a “kit of market parts” that will be used to build a market system for the node of Holliston Park. And although the majority of these elements need no further description before being utilized in such a design, the following section more fully describes the “Market Function Components” of “vendor space”, “market carts” “temporary unloading” “vendor parking” and “servicing/enclosure.”

Kit Element #1:
Market Function Components


Vendor Space


Market Carts


Temporary Unloading



Vendor Parking

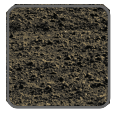

Servicing/ Enclosure

Kit Element #2:
Ground Surface Materials


Reinforced Grass


Stone Pavers


Concrete


Cultivated Soil


Crushed Stone


Wooden Deck

Kit Element #3:
Landscape Elements/ Public amenity Features


Shade Trees


Fruit Trees


Benches


Picnic Tables


Community/ Allotment Garden Plots

Kit Element #4:
Recreational Facilities


Basketball Court


Baseball Diamond


only
Swimming Pool


only
Skating Rink


Skateboard Park

FIGURE 5.2 - A Kit of Market Parts

5.1_c Elaboration/Development of "Market Function Components"

As the main programmatic elements of any market system, the "Market Function Components" of "vendor space", "market carts", "temporary unloading", "vendor parking" and "servicing/enclosure" are all crucial in building market systems that are both functional and amenable. And so, the following section briefly discusses the requirements/opportunities of each element as well as presents/develops several typologies of each that will be used in the subsequent design for Holliston Park.











Vendor Space

It goes without saying that the first element necessary in any market system is a place for vendors to sell their goods.

Precedent research has shown that a 12'-0 x 12'-0 space will accommodate the majority of vendors (with those selling meat and dairy products a potential exception). And so, based on discoveries made in Chapter 4 regarding the number and composition of producers required to provide a community with 80 percent of its required foodstuffs (see Section 4.3), the anticipated maximum number of vendor stalls required for any "neighbourhood farmers' market" in the outlined system would be the equivalent of about 130 12'0 x 12'0 stalls. (This allows one stall for every one of the 101 vegetable, fruit, and grains producers; and a double stall for every one of the 13 livestock and dairy producers).

There are two main ways that these stalls can be organized in order to establish efficient, functional markets. In this thesis they are being referred to as: "direct truck access," and "back to back."

Direct Truck Access Stalls

Arguably, the simplest configuration of such stalls would be into single rows, with each stall having direct truck access from one side. By leaving the stalls approximately 15'-0" apart, a comfortable pedestrian walkway is created, while vendor parking and unloading is extremely convenient.

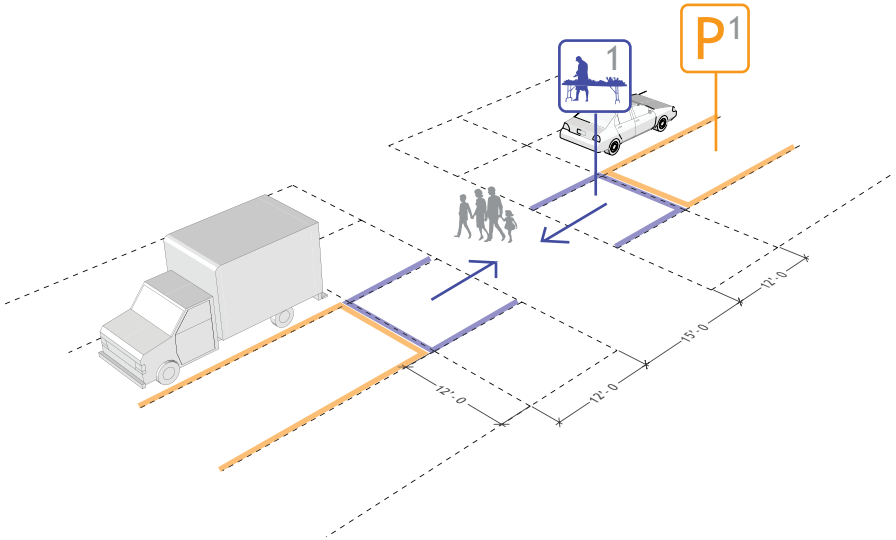


FIGURE 5.4 - Vendor Space, Direct Truck Access

Back-to-Back Stalls

Alternatively, stalls could be arranged "back-to-back". While it is easy to see how such an arrangement can be much more space efficient (with 130 stalls requiring approximately 32,000 sq. ft. or 0.75 acres rather than 108,000 sq. ft., or 2.5 acres in case of "direct truck access"), because market trucks are not able to unload directly, a significant amount of additional infrastructure is required. This includes temporary unloading, vendor parking, and market carts (see following three elements).

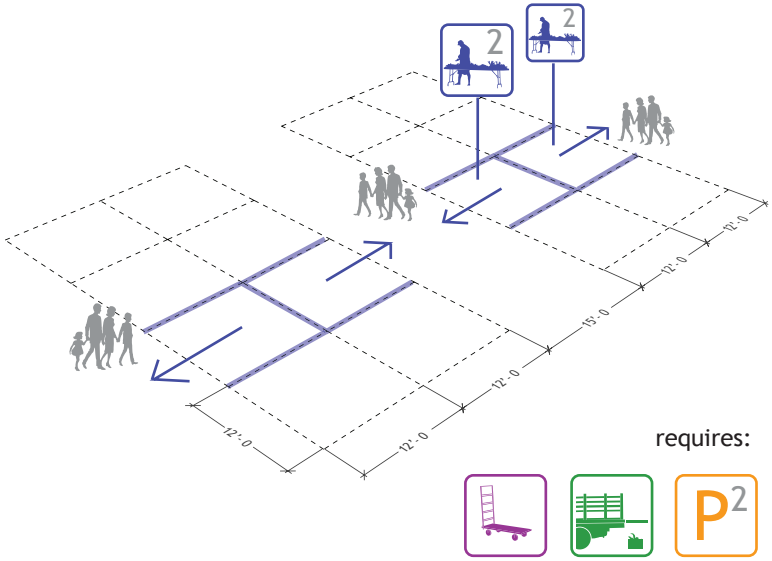


FIGURE 5.5 - Vendor Space, Back to back Stalls









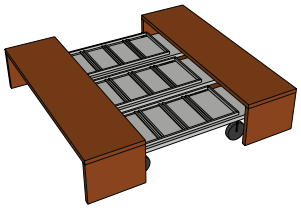


Market Carts

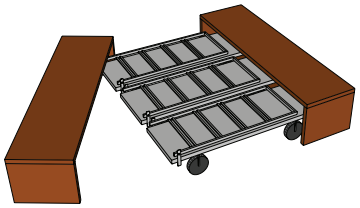
In any situation where vendor trucks are unable to unload directly at their stall, it becomes necessary to find a way for vendors to easily shuttle goods from their vehicles to their stalls. The most common way this is done is with large flat bottomed carts.

Typically, such “market carts” are utilized only indoors as they work best on hard, relatively smooth surfaces, and require storage on off-market hours/days. However outfitted with larger wheels and designed such that they can collapse into public furniture (for instance), this thesis imagines them as a viable piece of any outdoor market system as well - providing vendor equipment, and public amenity all in one.

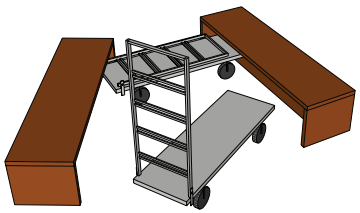
Due to time constraints only one manifestation of such a system has been designed, however it is worth noting that there are many, many more possibilities.



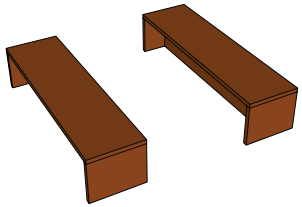
a) when not in use, vendor carts are collapsed and stored as part of public furniture



b) when unlocked, one of every pair of benches pivots to release vendor carts



c) carts are then erected and used by vendors to shuttle goods from trucks to stalls



d) on market days, while carts are elsewhere, benches are able to be used as market stalls as well

FIGURE 5.5 - Market Carts, the general system

1a Exposed

Constructed durably, it is imagined that such a system could be implemented without any additional infrastructure - with both carts and benches being exposed to the elements during the summer months, with carts then being removed and stored inside for winter.

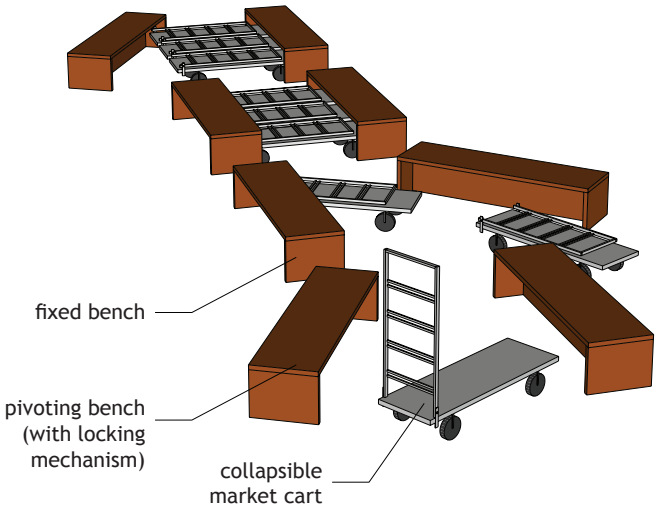


FIGURE 5.6 - Market Carts, Exposed

1b Sheltered

Covered with a light-weight trellis, a very amenable space is created both for vendors using the space on market day, as well as the general public both on market and non-market days.

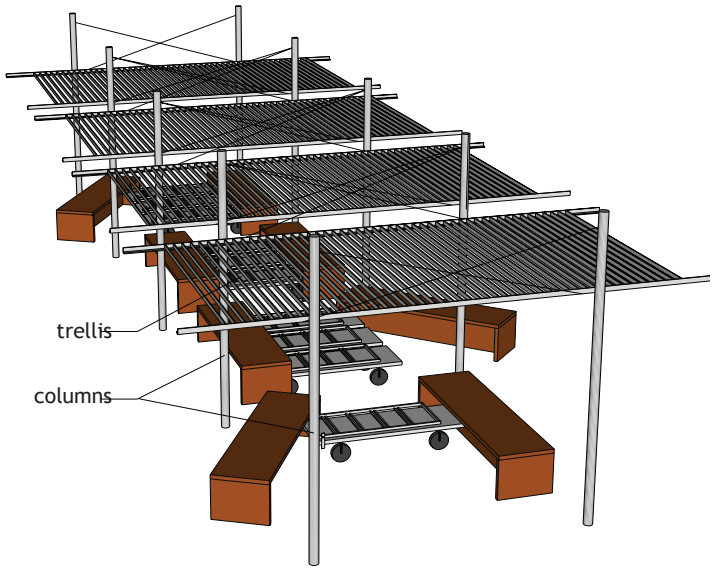


FIGURE 5.7 - Market Carts, Sheltered







Temporary Unloading

Similarly to the need for market carts, temporary unloading is also required for any vendor stall that is not “direct truck access.”



It is important that such areas be located as close as possible to vendor stalls as well as market carts, for easy accessibility. It is also important that such areas are generous as some trucks require a significant turning radius. In addition to this, by combining such stalls with a one-way traffic system, the width of access lanes can be minimized, while making them hard surface allows for them to used as a potential vendor overflow space during peak market seasons.



Back-in

The most efficient configuration of temporary unloading is a "back-in" configuration. Arranged around the perimeter of any market, this provides the most vendors simultaneous access for unloading.

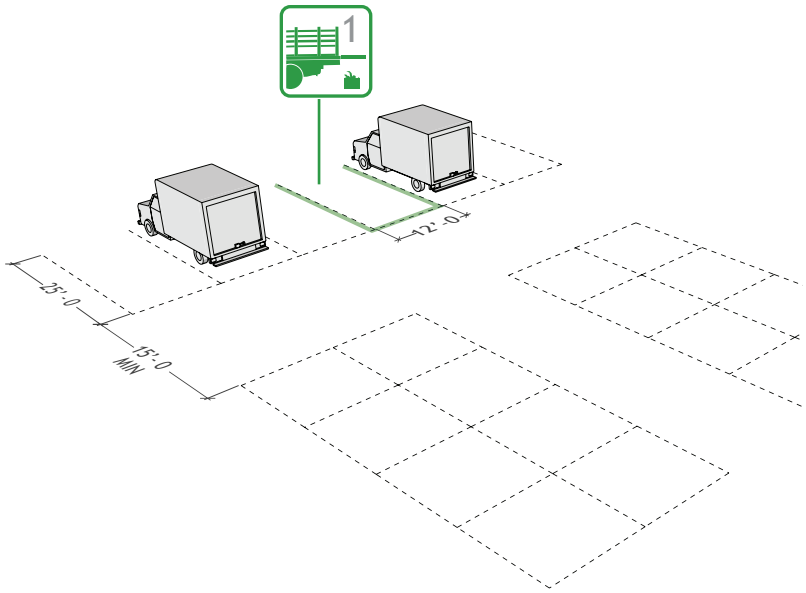


FIGURE 5.8 - Temporary Unloading, Back-in

Parallel Park

It is also possible to have vehicles unload from a parallel park position along the periphery of the market. Although fewer trucks have access to the periphery at any one time using this configuration, it is appropriate for situations with limited space, or along existing roadways.

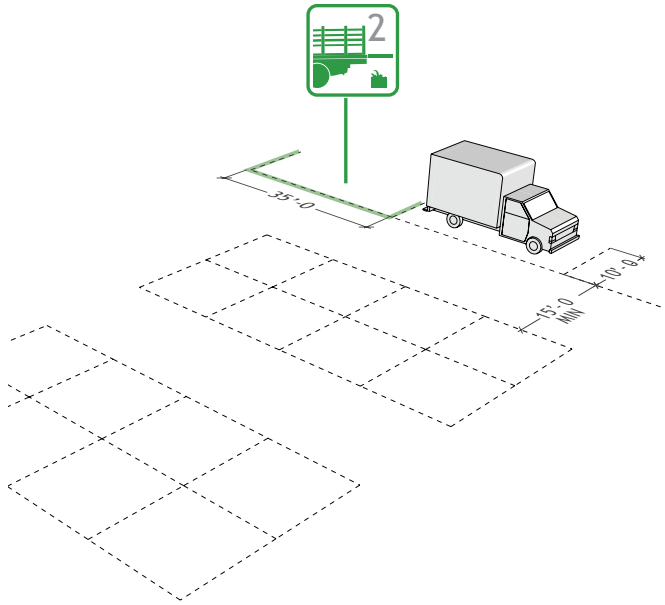


FIGURE 5.9 - Temporary Unloading, Parallel Park











Vendor Parking

While vehicle sharing and carpooling between vendors is a very real possibility given that if such a system does come to fruition there will be a significant number of vendors living in relative close proximity to each other, with a 130-stall market, there will still be a significant number of vendor vehicles to accommodate.

While it is possible that street parking may provide for a good number of these vehicles (in Saskatoon especially, since most streets are extremely wide and accommodate parking on both sides), it is most likely that some amount of vendor parking will need to be accommodated on site. There are two main ways this can occur: “direct access” (as discussed earlier) and “satellite”.

It is worth noting that the following market system does not account for customer parking. Since every market is ideally serving a community within a 10-minute walk, it is assumed that the vast majority of consumers will not be requiring vehicular transportation to the site. Shuttles may be arranged for seniors or others requiring assistance.

Direct Access

In conjunction with "direct access" vendor stalls, "direct access vendor parking" is the most convenient for vendors, however as the market size grows, such an arrangement becomes impractical. For even combined with a one-way traffic system, an access path of 32'-0 would be required in order to ensure that larger trucks could get into their stalls.

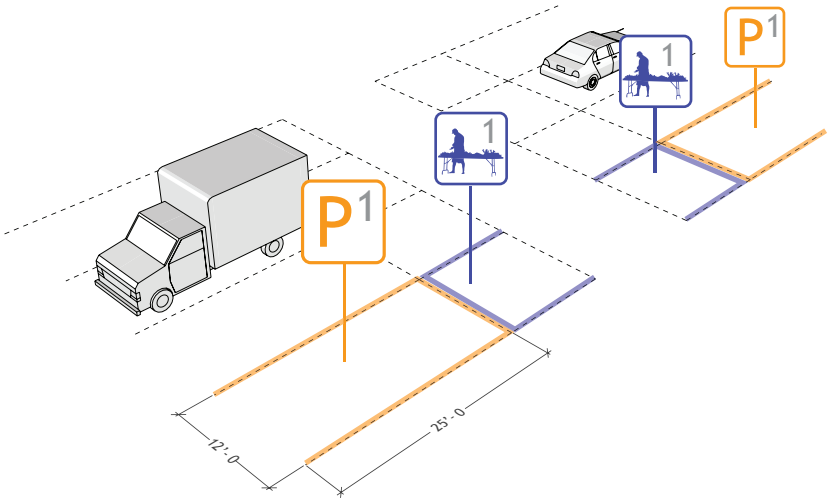


FIGURE 5.10 - Vendor Parking, Direct Access

Satellite

More commonly, vendor parking will be accommodated at the edge of the market site. With the provision of adequate unloading and market cart areas, it is foreseeable that parking lots can be several hundred meters away from the market and still remain very functional.

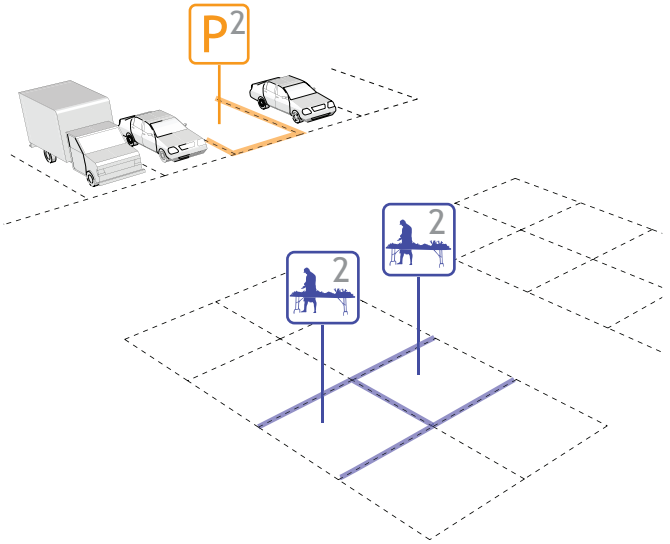


FIGURE 5.11 - Vendor Parking, Satellite











Servicing/Enclosure

While it is possible that some markets remain fully-exposed summer-only markets indefinitely, in order to have a year-round market in Saskatoon, enclosure is necessary. And so, the following study outlines a system of "servicing/enclosure" typologies that could be incrementally added to the "back to back" stall system in order to increase both permanence and functionality over time.

It is worth noting that while the first two "levels" of this servicing/enclosure infrastructure can be discussed in terms of either the "direct truck access" or "back to back" stall systems, once permanent shelter is added to the system (i.e. level 3) direct truck access becomes impractical, and so the last five levels of this servicing/enclosure infrastructure are discussed exclusively in terms of their applicability to the "back to back" system.

a Space Allocation Only

In the simplest case, vendor spaces and pedestrian pathways can be established with no infrastructure at all. Marked on the ground with chalk or some other temporary device, or simply spoken indication, 12’-0 x 12’-0 spaces (and parking stalls in the “direct access” case) are simply allocated to vendors in order to accommodate portable tents, tables, coolers, etc.

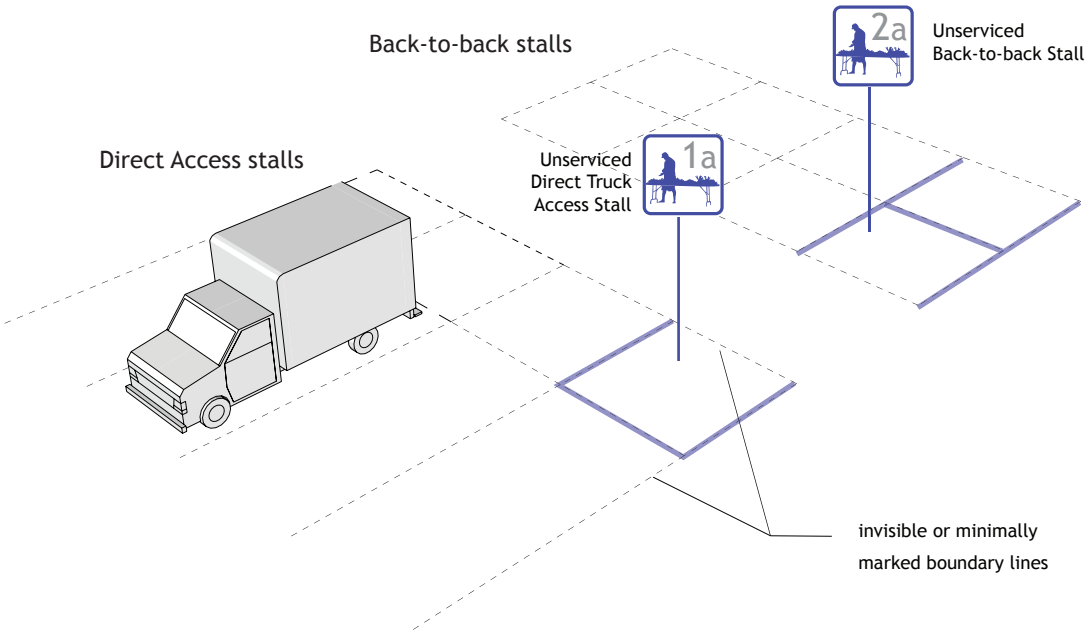


FIGURE 5.12 - Servicing/Enclosure, Space Allocation Only

b Services and Post Holes

For vendors needing to keep products hot or cold (e.g. meat, eggs, dairy, prepared hot or frozen foods, etc) the provision of electrical services is key in making market systems a viable method of distribution. In both the direct access and back-to-back stall systems, in-ground electrical services can provide such functionality while keeping the space unobstructed for other uses. In addition to this, in-set post holes will not only help to define market spaces more permanently, but aid vendors in keeping their tents securely fastened during inclement weather as well.

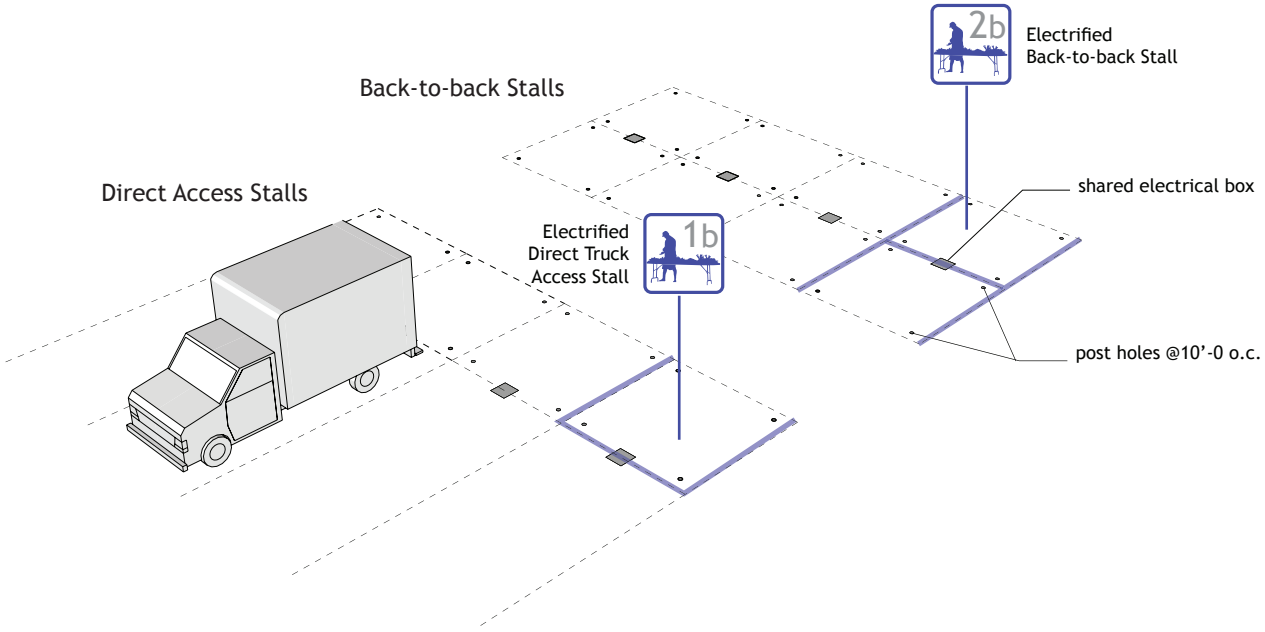


FIGURE 5.13 - Servicing/Enclosure, Services and Post Holes

C Open-air Pavilions

Besides electricity, the next critical piece of a more permanent market system would be shelter. Erected between back-to-back stalls and outfitted with retractable awnings, simple pavilion structures such as the ones illustrated below would not only provide permanent shelter to vendors on market days, but on non-market days could provide significant amenity for the surrounding neighbourhood as well. The versatile and open-air nature of the structures allow them to be used for a variety of social functions such as community barbecues, family picnics, or senior's card games.

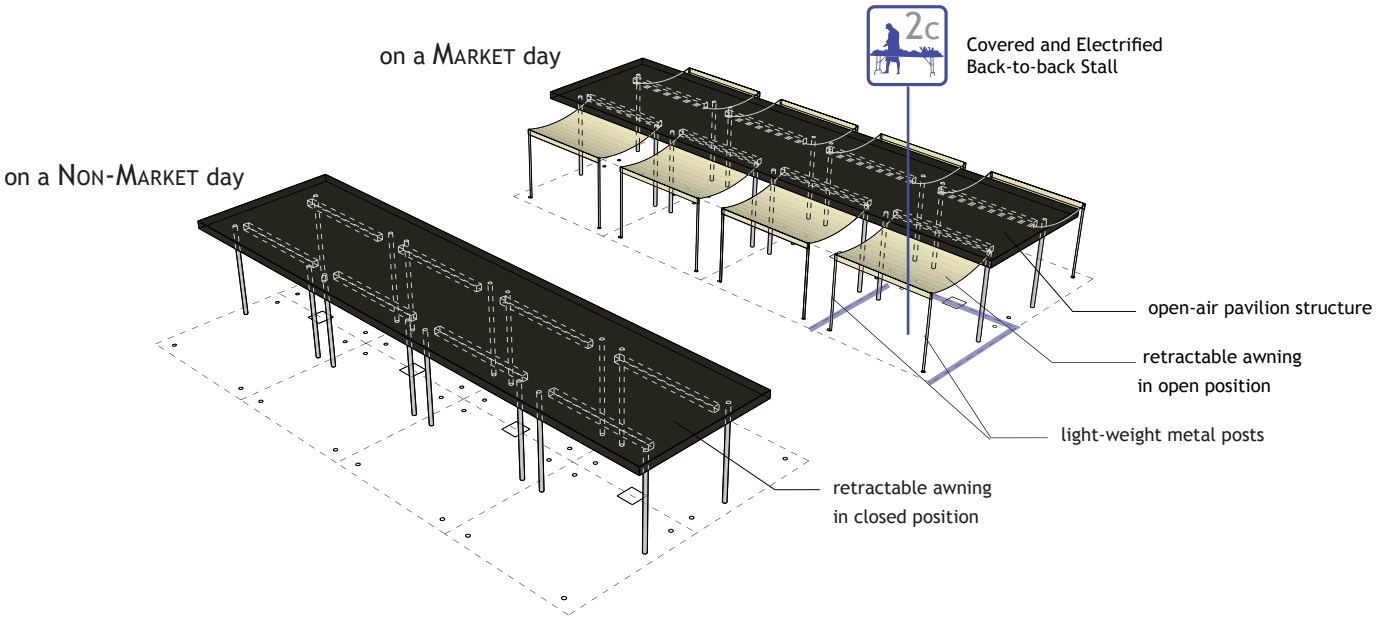


FIGURE 5.14 - Servicing/Enclosure, Open-air Pavilions

d

Semi-Enclosed Shelter and Storage

While the addition of open-air pavilions would eliminate the necessity of vendors having to bring tents or other shelter to the market every week, for many (meat and dairy producers especially) a fully-enclosed, lockable space is key in order to eliminate the transportation of other large pieces of equipment (such as meat coolers, tables and display racks) as well.

And so, by enclosing open-air pavilions on either end with a solid wall, and on both long sides with a wooden trellis that can pivot open and closed, not only is more complete protection afforded to vendors, but a secure 5'-0 x 12'-0 storage space is then created within every vendor stall, allowing for a significant amount of storage during off-market days as well.

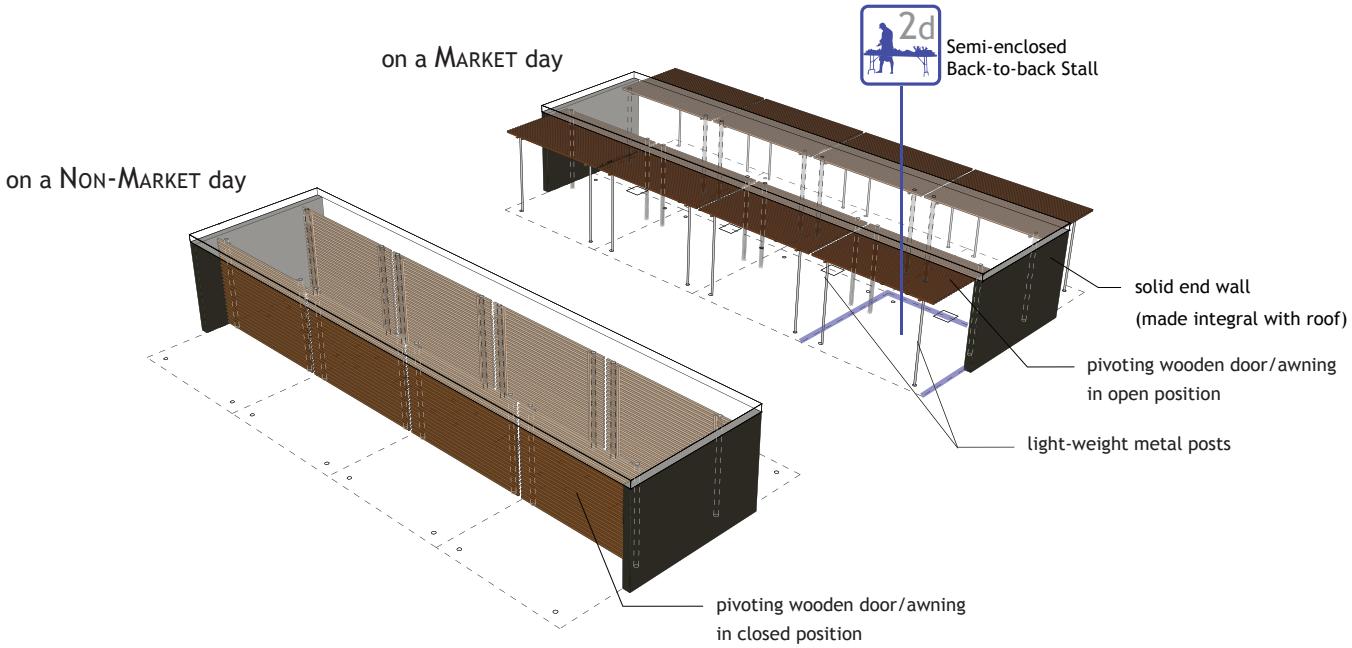


FIGURE 5.15 - Servicing/Enclosure, Semi-enclosed Shelter and Storage

e Fabric Canopies

Shelter is not only an important element in making *vendor* spaces more amenable, but *pedestrian* spaces as well. Erected over main pedestrian walkways, fabric canopies or other light weight structures can provide significant microclimate amendment, while being relatively easy to install and requiring minimal investment.

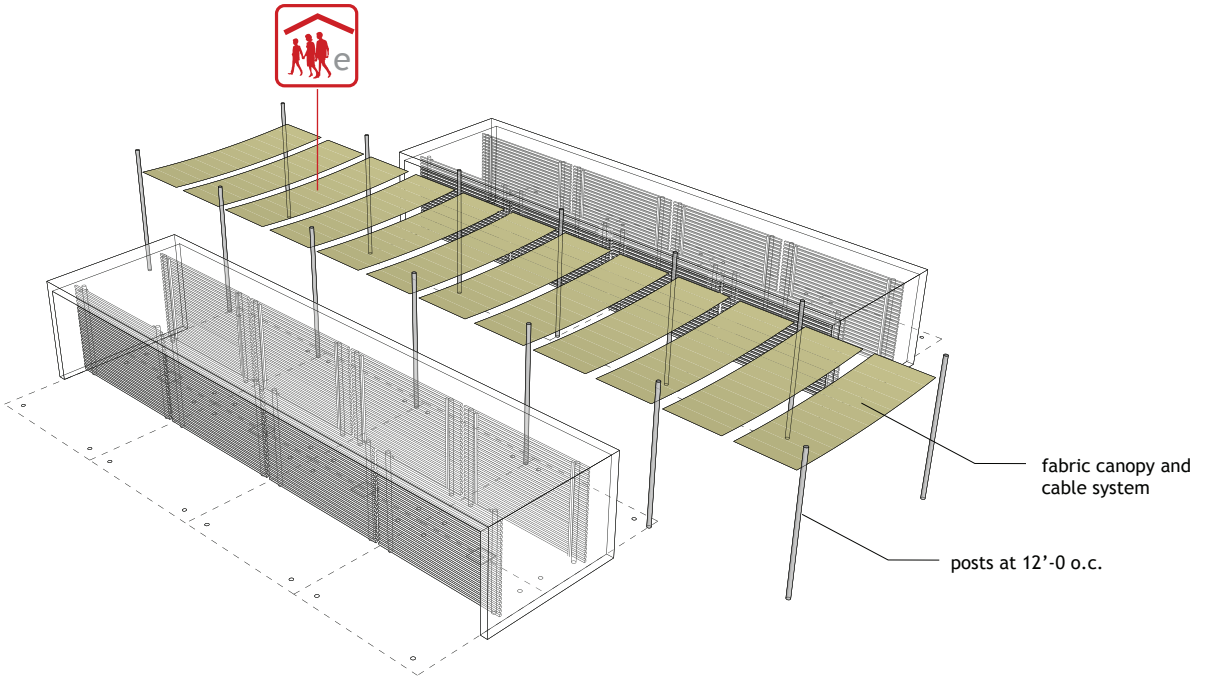


FIGURE 5.16 - Servicing/Enclosure, Fabric Canopies

Enclosed Building

While the semi-enclosed open-air nature of the previous market system may be suitable for some time, in order to have a year-round market in Saskatoon, full-enclosure is necessary. And so, by adding an insulated wall down the spines of the previously erected semi-enclosed pavilions, a solid roof that stretches over the 15'-0 pedestrian path, and a glazed curtain wall system to connect the two, full enclosure is achievable.

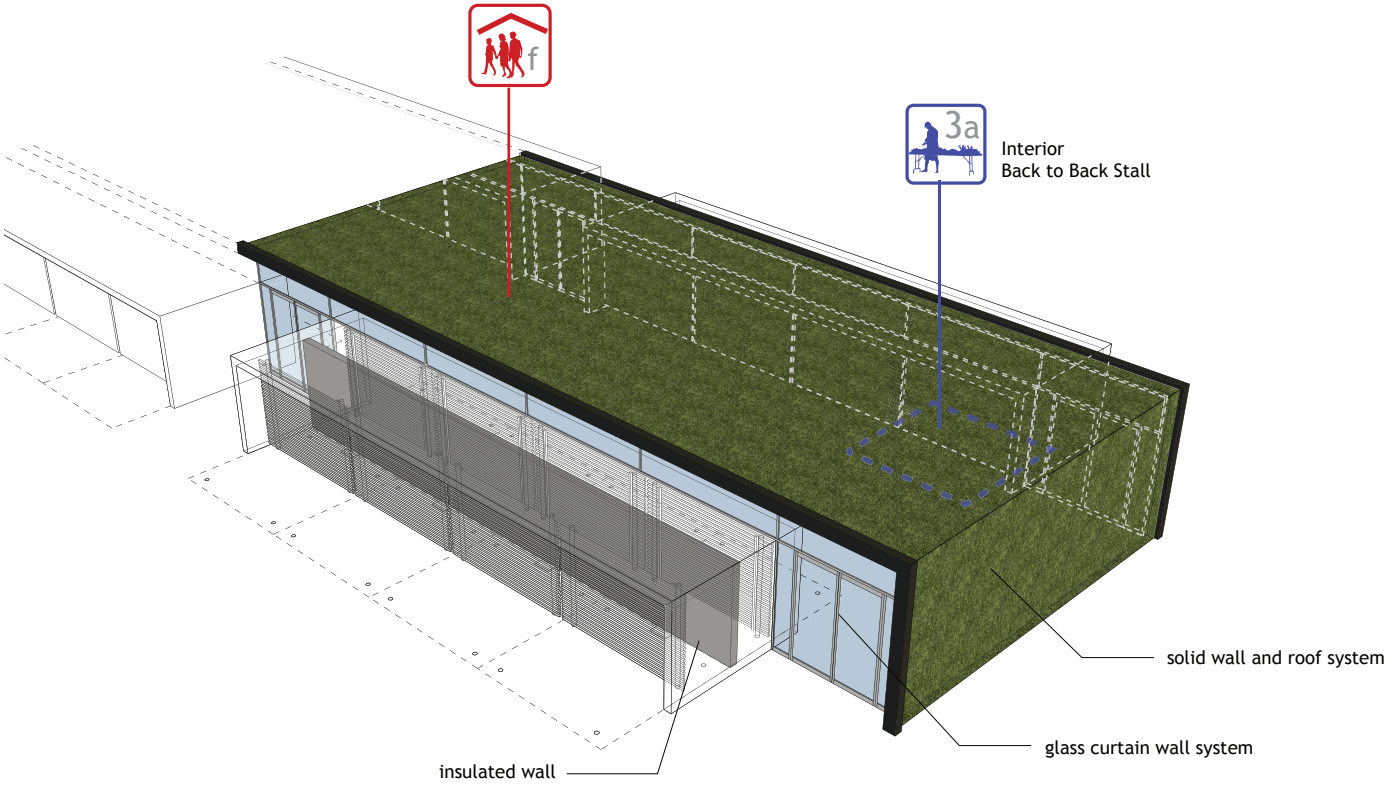


FIGURE 5.17 - Servicing/Enclosure, Enclosed Building

g Enclosed Cart Storage

While the previous system of enclosure would provide an indoor space for both vendors and consumers, it would be extremely minimal. By stretching the enclosure over a more generous area, such as that used previously for a row of exposed or covered market carts, a more generous fully-enclosed space is achievable. Once enclosed, such a space not only becomes a great amenity for consumers, but can also be used as an additional vendor space for producers requiring minimal infrastructure such as fruit or vegetable growers.

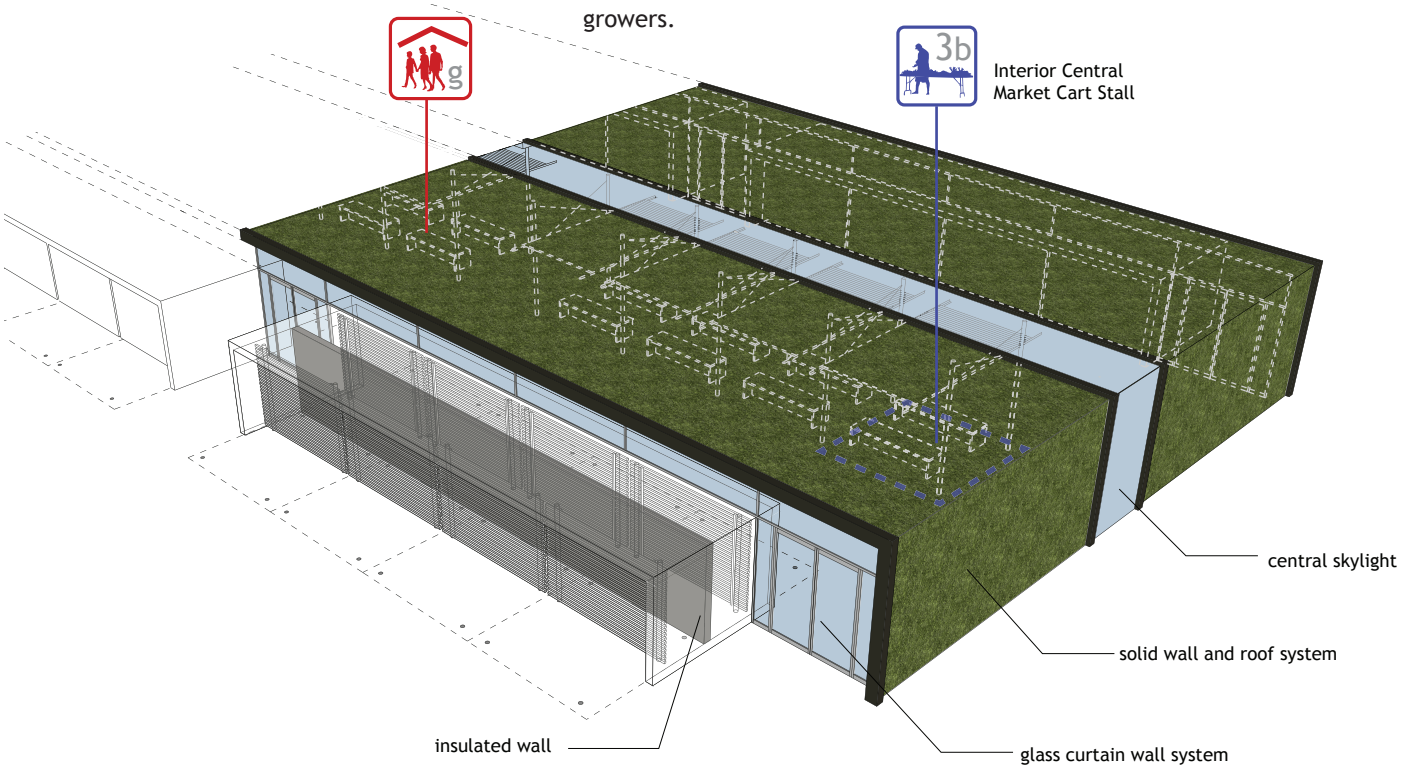


FIGURE 5.18 - Servicing/Enclosure, Enclosed Cart Storage

"Market Function Components", A Summary

And so, taken together with the other elements of the "kit of parts" (i.e. Ground Surface Materials, Landscape Elements/Public Amenity Features, and Recreational Facilities), the typologies of vendor space, market carts, temporary unloading, vendor parking and servicing/enclosure developed here (and illustrated for easy reference in the adjacent chart) will be utilized as the "full kit of parts" from which to develop a market system for the node of Holliston Park.

Market Carts

1a Exposed
cart/public furniture system

1b Covered
cart/public furniture system

Temporary Unloading

1 Back-in
Temporary Unloading

2 Parallel
Temporary Unloading

Vendor Parking

P1 Direct Access
Vendor Parking

P2 Satellite
Vendor Parking

Enclosure

a = Space Allocation

b = Electricity and P. Holes

c = Open-air Pavilions
w/ electricity and post holes

d = Semi-enclosed Shelter
w/ electricity and post holes

Wooden trellis and end walls

e = Fabric Canopies

f = Enclosed Building

g = Enclosed Cart Storage

Vendor Space

Direct Truck Access Stalls

1a Unserviced
Direct Truck Access Stalls,

1b Electrified
Direct Truck Access Stalls,

Back-to-Back, Exterior Stalls

2a Unserviced
Back-to-back Stalls

2b Electrified
Back-to-back Stalls

2c Covered
Back-to-back Stalls,

2d Semi-enclosed
Back-to-back Stalls

Interior Stalls

3a Back-to-back
Interior Stalls

3b Central Market Cart
Interior Stalls

FIGURE 5.19 - "Market Function Components" Reference Legend

5.1_d The Developed System

As mentioned earlier, in order to accommodate both the producers and foodstuffs necessary to provide the community of Holliston Park with 80 percent of its year-round food supply, a 130-stall market is required.

Recognizing that a building of such capacity would not only be difficult to finance, but also terribly under-utilized initially (as both producer and consumer need to gain capacity before such a system can become viable), the market design for Holliston Park has been imagined as four separate systems. Systems that will be played out in phases; phases that will incrementally build both the capacity and permanence of the market as increasing financial resources as well as community commitment become available.

In order to illustrate this, the following drawing set describes, in order, Market Systems 1 to 4. Each system is first introduced with a plan showing the "infrastructure required" (e.g. hard surfacing, trees, enclosure) for that system, followed by a plan (or plans) describing the "resulting systems" (i.e. the configuration of vendor stalls, market carts, parking and unloading) made possible as a result of that infrastructure. Following this, a set of sections - one for each plan - illustrates the spaces created by such a market not only on market days but on non-market days as well.

It should be noted that this is not intended to be a *building* design. While form and materials of built components are suggested, the elements themselves (developed only briefly through the kit of parts) are all still very schematic, and should be utilized only so much as to understand the incremental buildup of the pieces of the system, which was the prime focus of the following exercise.

INFRASTRUCTURE REQUIRED

In the first case, it is imagined that by simply adding some vegetation and three hard-surfaced areas (one south of the existing skating rink, one south of George Ward Pool, and one 6 m wide path that joins both to Grosvenor Ave.) a market of substantial capacity can become possible with very little infrastructure or investment.

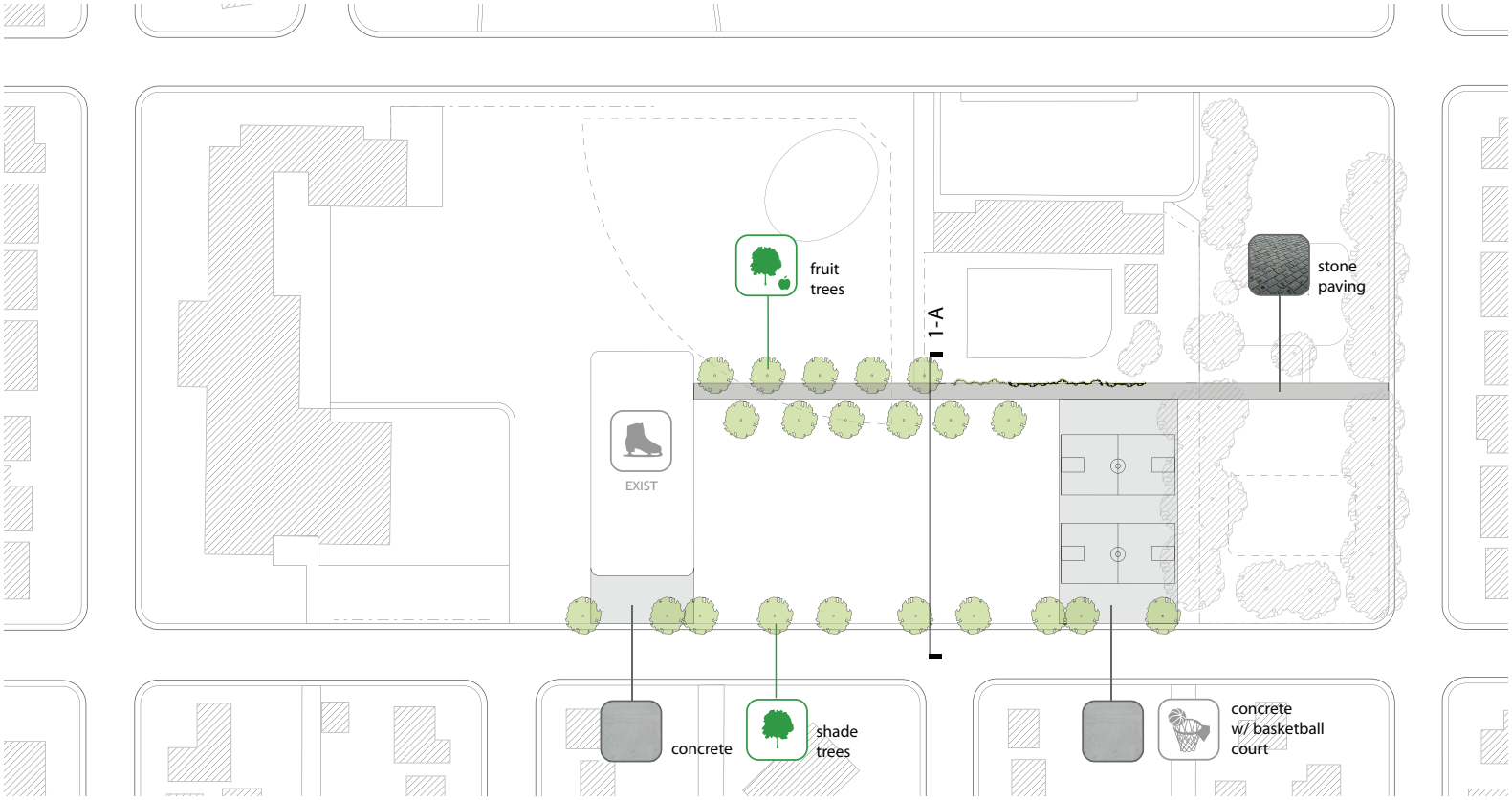


FIGURE 5.20 - Site Plan, Market System 1 - Infrastructure Required

Resulting Summer Market

By utilizing the hard-surfaced areas as a one-way transportation route, it becomes quite easy to establish a “direct access” market system on the site. Running parallel to Third Street, two rows of direct access market stalls and their trucks can easily be accommodated, while leaving a 15’-0 pedestrian access path down the middle. While up to 52 stalls could be accommodated in this way, a capacity closer to 40 seems more reasonable after taking into consideration wasted space and allowing for some double-sized stalls.

System Summary:

1 38 P1 52

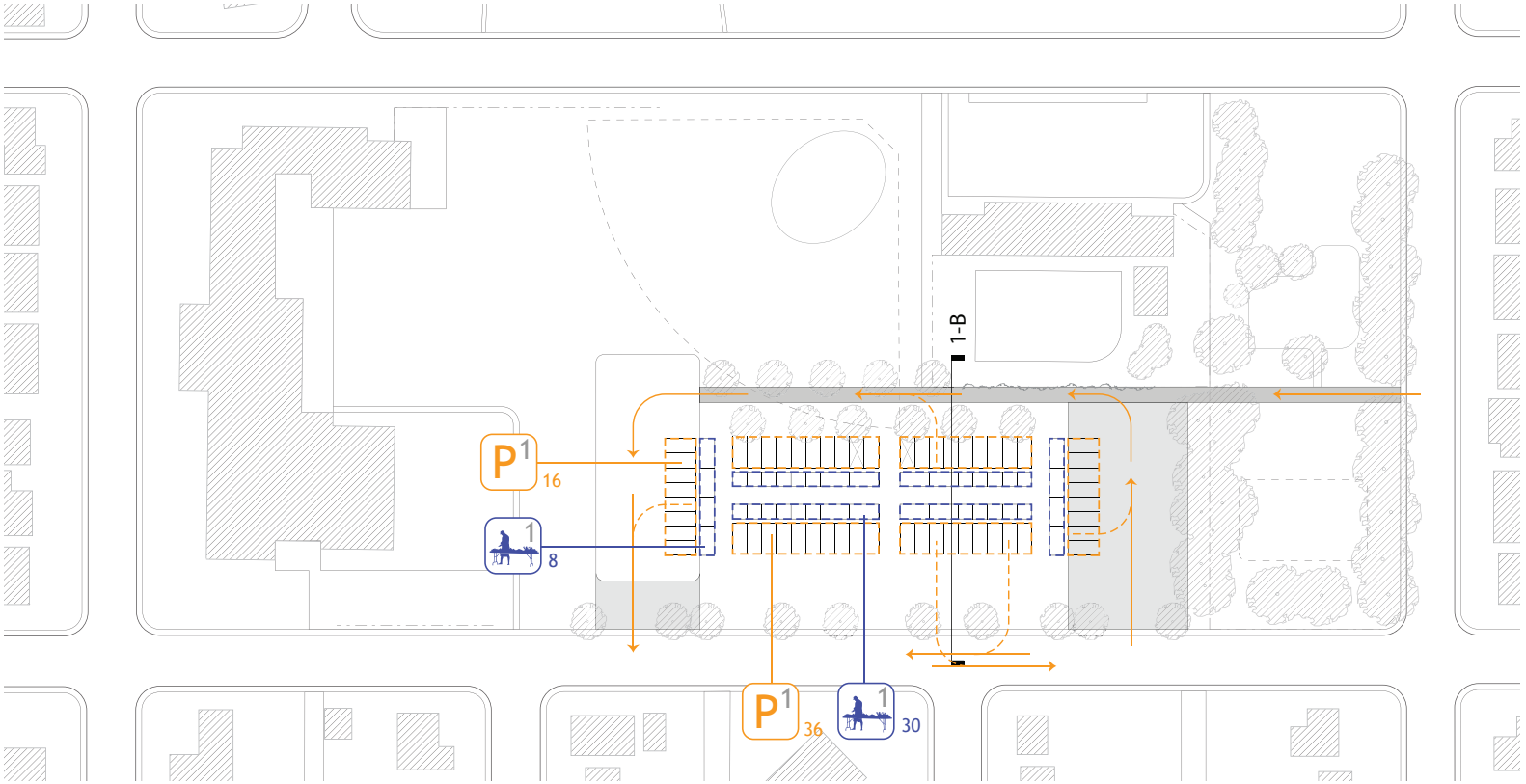


FIGURE 5.21 - Site Plan, Market System 1 - Summer Market System

Section 1-A

Market System 1
On a Non-Market Day

For the majority of the week, the added infrastructure does not limit the use of the space but in fact contributes to its increased use. Besides being used freely by both school and neighbourhood children for things such as pick-up soccer, games of frisbee, kite flying, etc., basketball courts installed as part of hard-surfaced areas provide additional amenity.

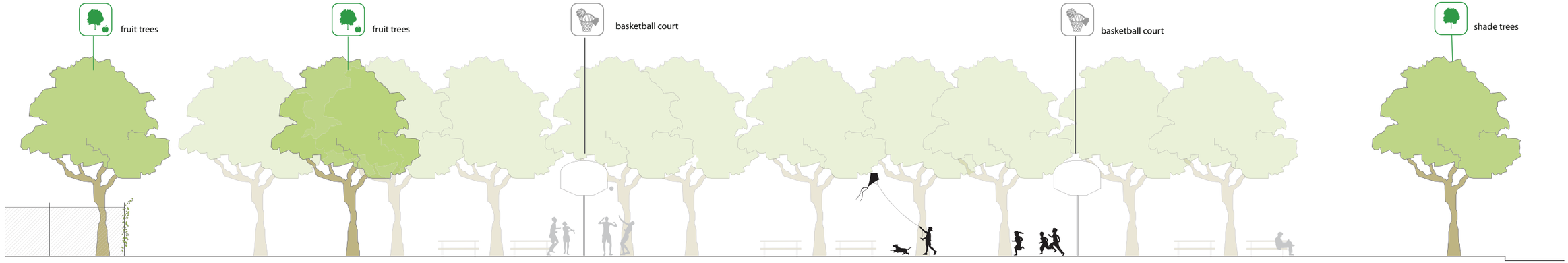
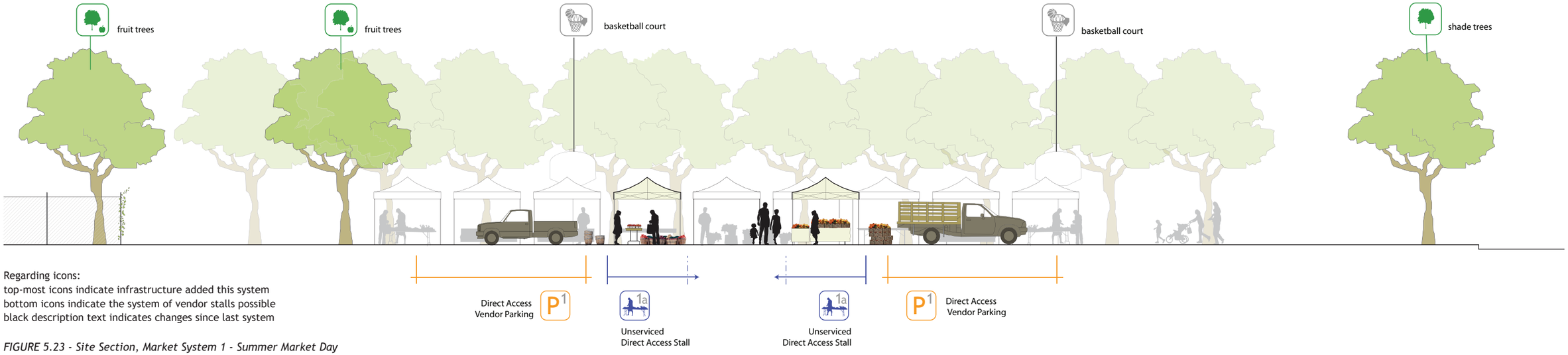


FIGURE 5.22 - Site Section, Market System 1 - Non-market Day

Section 1-B

Market System 1
On a Summer Market Day

Lined by vendor vehicles, tents, tables, as well as the produce itself, the 15'-0 wide open space left between vendor stalls becomes the heart of a vibrant, bustling market for one day a week throughout the summer months. With hard surfacing and trees being the only permanent infrastructure, the resulting market is highly flexible - varying weekly depending upon the weather, produce and vendor availability.



Regarding icons:
top-most icons indicate infrastructure added this system
bottom icons indicate the system of vendor stalls possible
black description text indicates changes since last system

FIGURE 5.23 - Site Section, Market System 1 - Summer Market Day

Market System 2

Infrastructure Required

With a desire to provide both vendor and consumer with greater amenity, as well as increase the capacity and density of the market, the second phase of the system sees two rows of pavilions - one open-air and one semi-enclosed with storage - added to the site. Facilitating the more dense arrangement of back-to-back stalls, a set of market carts and their storage facilities, as well as an additional hard surfaced area, have also been added.

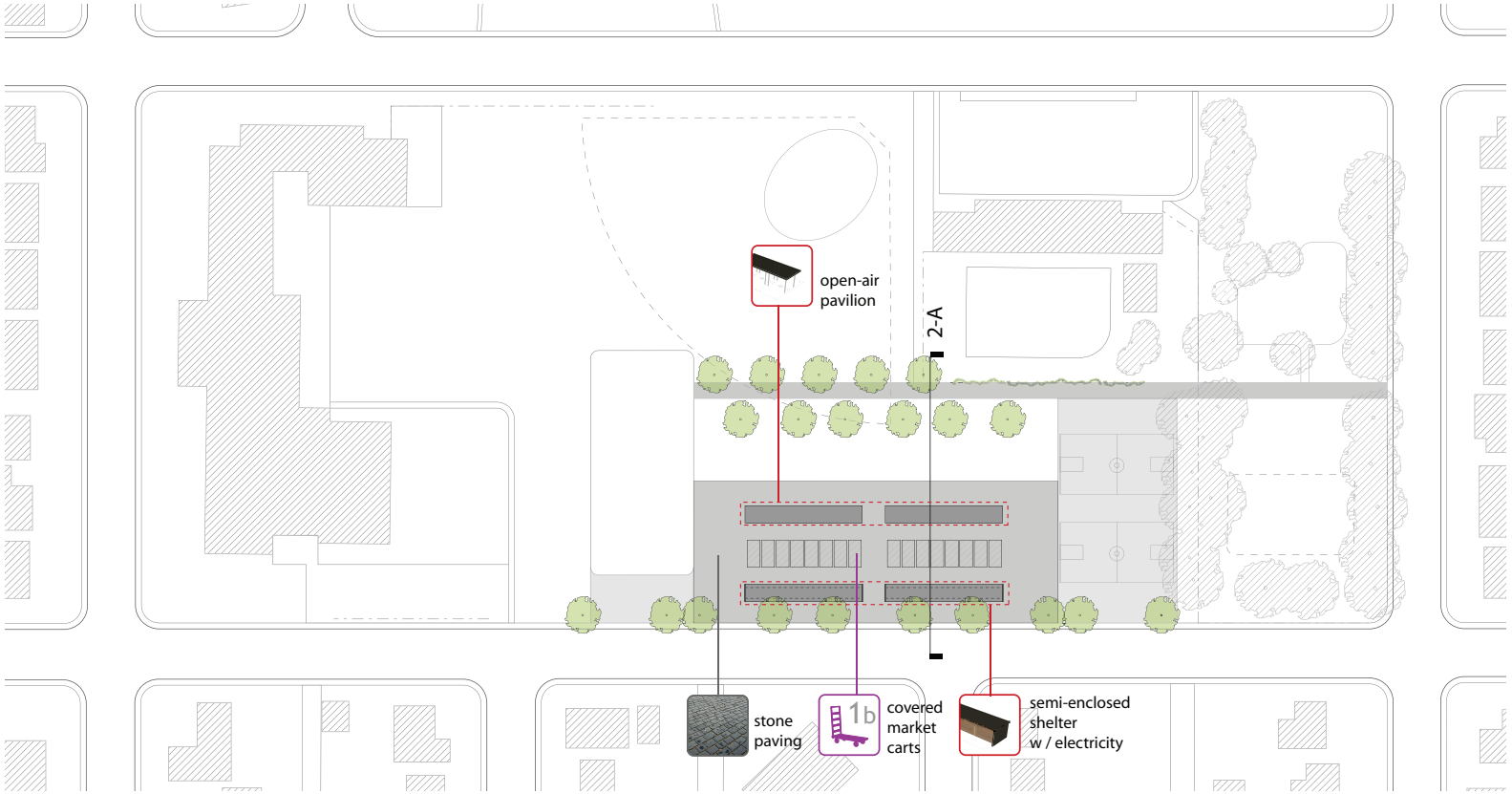
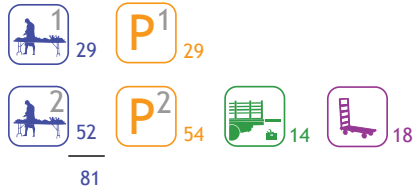


FIGURE 5.24 - Site Plan, Market System 2 - Infrastructure Required

Resulting Summer Market

With one row of direct access stalls being replaced with two rows of back-to-back stalls, the market's capacity increases significantly - from about 40 in System 1 to over 80 in System 2. In order to facilitate this, the one-way traffic system is maintained with both the skating rink, basketball court, school parking lot, and nearby street areas accommodating the parking and unloading required.

System Summary:



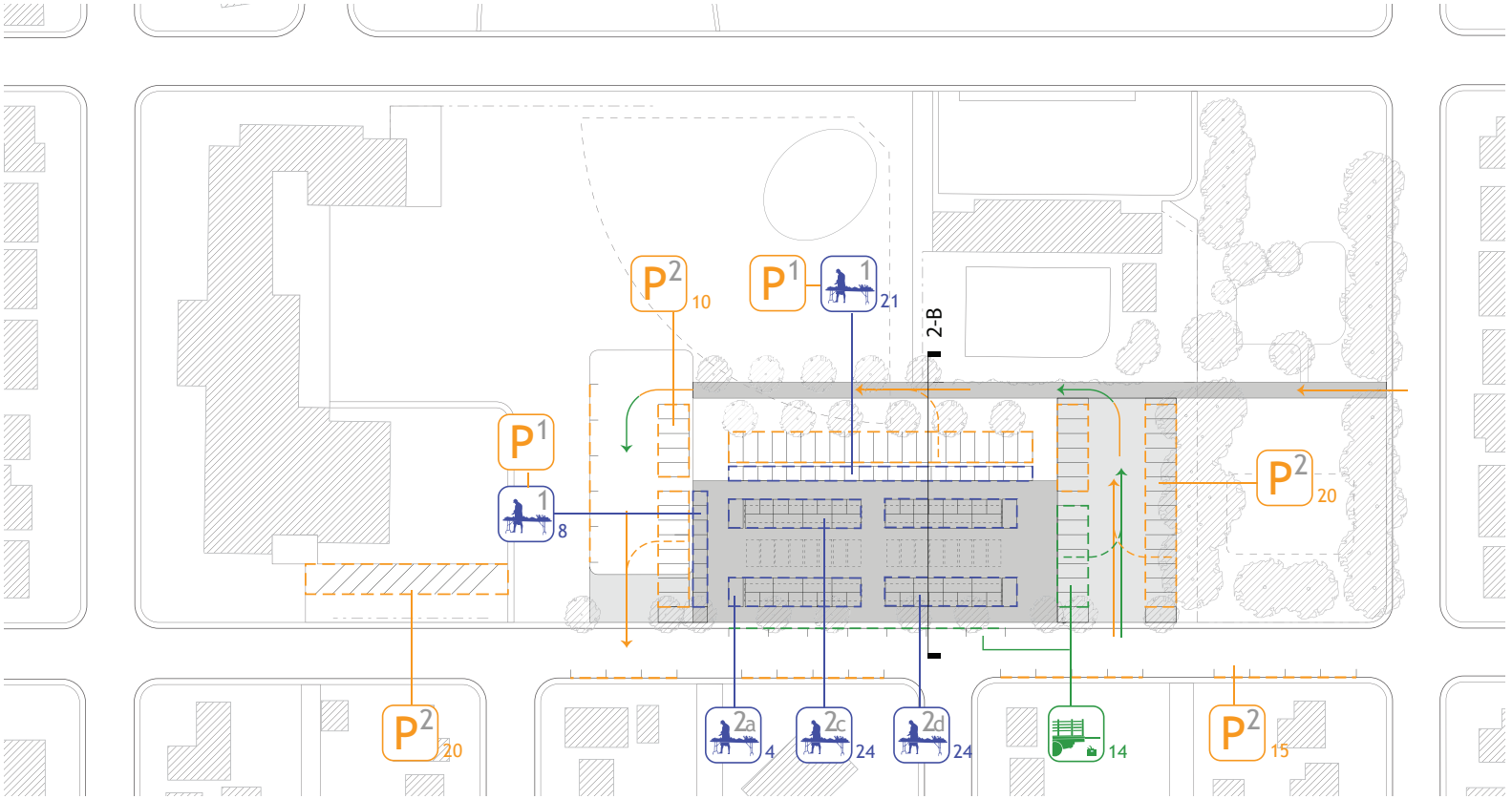


FIGURE 5.25 - Site Plan, Market System 2 - Summer Market System

Section 2-A

Market System 2
On a Non-Market Day

For the majority of the week, the southern-most row of infrastructure added to the site (the semi-enclosed shelters along Third Street) remain closed; separating the park space from the street, and establishing a more intimate public square behind. Containing both the open-air pavilions and covered market cart storage, added in this phase as well, this square provides several places for school children and community members alike to gather, while still exhibiting considerable open space for unstructured recreational activities.

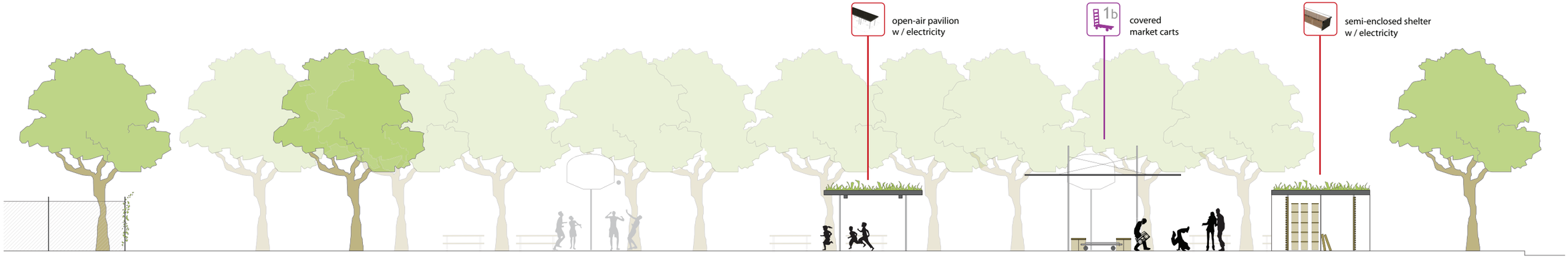
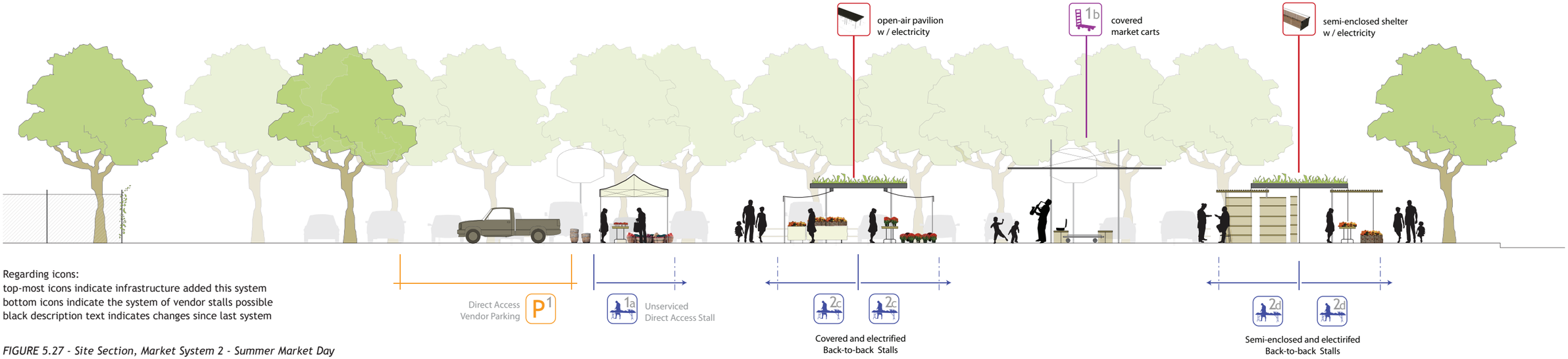


FIGURE 5.26 - Site Section, Market System 2 - Non-market Day

Section 2-B

Market System 2
On a Summer Market Day

While the two rows of added pavilions provide increased amenity to many vendors, the market carts and their associated storage area also provide significantly increased public amenity as well. For in addition to making possible a bigger, more substantial market, centrally located and covered market cart storage area provides an area that can be utilized for any number of associated activities, such as buskering, children's activities or simply used as a resting place for shoppers and vendors alike.



Regarding icons:
top-most icons indicate infrastructure added this system
bottom icons indicate the system of vendor stalls possible
black description text indicates changes since last system

FIGURE 5.27 - Site Section, Market System 2 - Summer Market Day

INFRASTRUCTURE REQUIRED

While the infrastructure added to the market in System 2 did succeed in increasing the capacity and amenity of the market substantially, in order to extend the length of the market's usability through all 12 months of the year, additional infrastructure is necessary. By adding wooden trellises and end walls to the row of existing open-air pavilions, enclosing the market cart storage area, and adding a row of fabric canopies as well as some additional hard surfacing, a market system that is functional in all four seasons becomes possible.

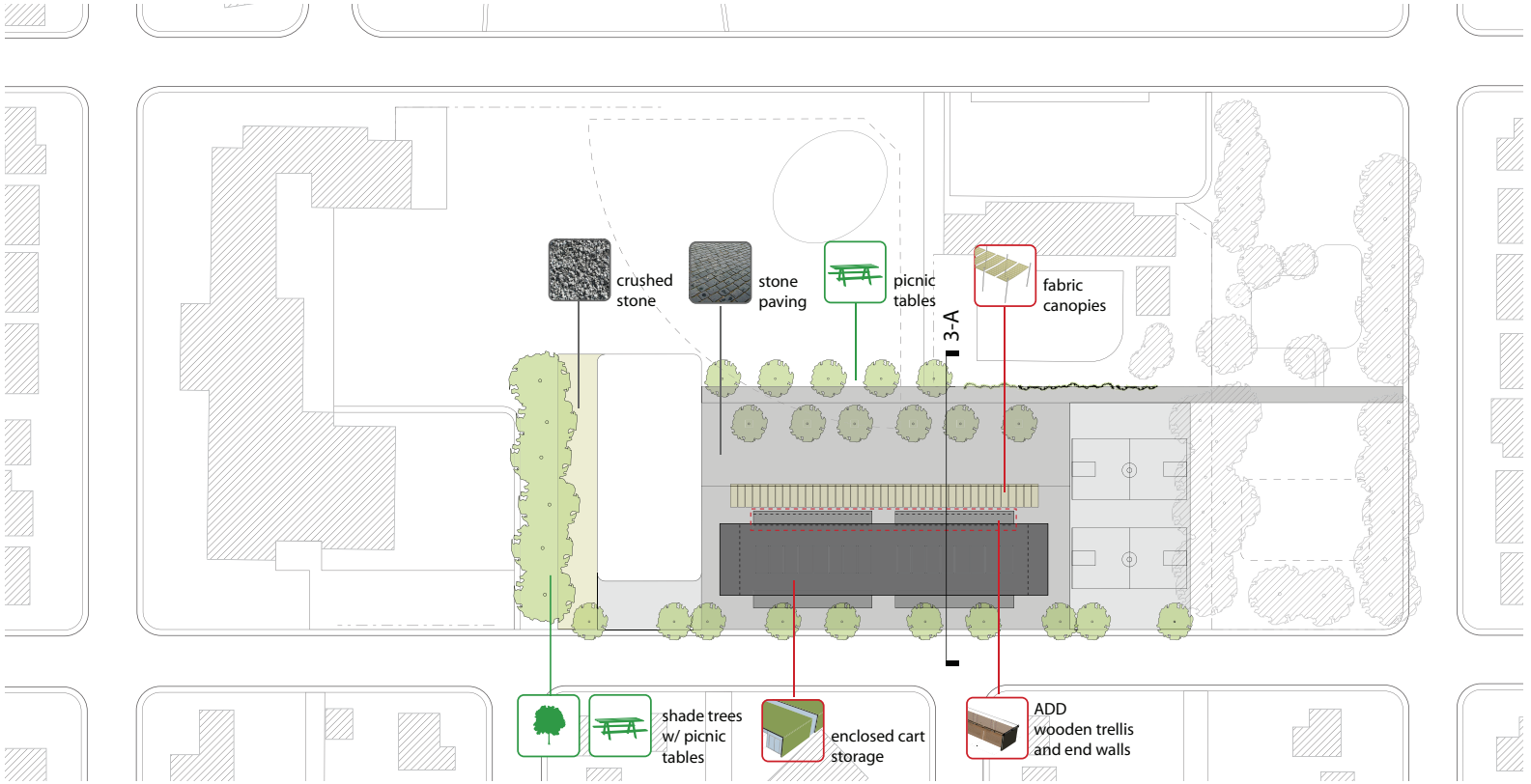


FIGURE 5.28 - Site Plan, Market System 3 - Infrastructure Required

Resulting Summer Market

While the addition of a fully enclosed building allows the market to function all year-round, expanded hard-surfacing allows for a significant increase in capacity during the summer months as well. Combined with the capacity of the main market, two rows of exposed back-to-back stalls (50 of which are double sized) increase the capacity of the market to 118 stalls. And although only 30 parking spaces can be accommodated on site once temporary drop-off areas have been allowed for, nearby street parking can easily handle the remaining 90 vehicles.

System Summary:



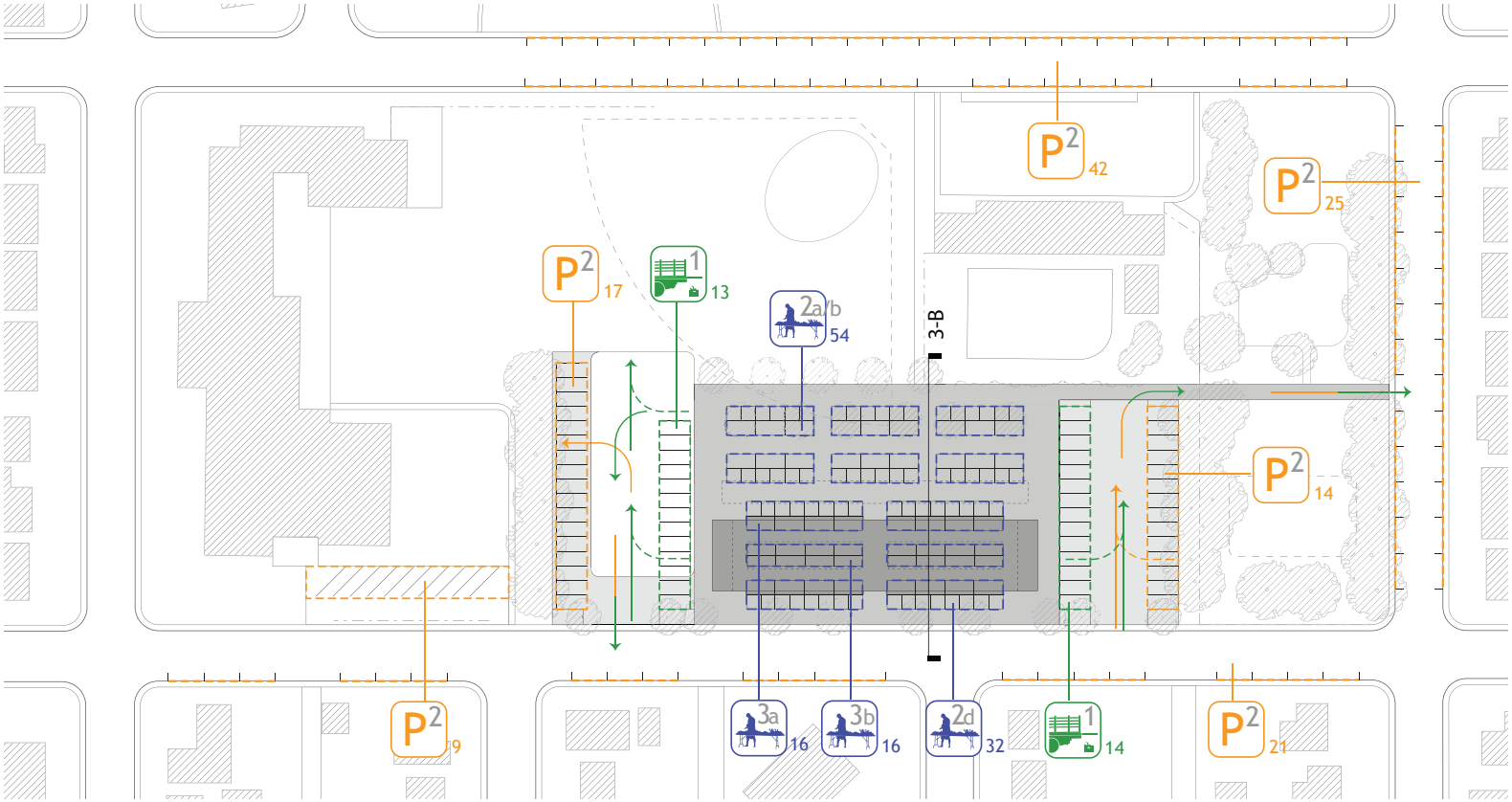


FIGURE 5.29 - Site Plan, Market System 3 - Summer Market System

Resulting Winter Market

With the addition of a fully-enclosed building, a winter market becomes possible. Since the required capacity of such a market will be considerably less than that of a summer market (as both producers and consumers learn how to stretch the seasons), utilizing only the fully-enclosed back to back stalls together with the central market cart area (with carts removed), the market system can accommodate up to 48 vendors throughout the winter months.

System Summary:

3 48 P² 49 14 30

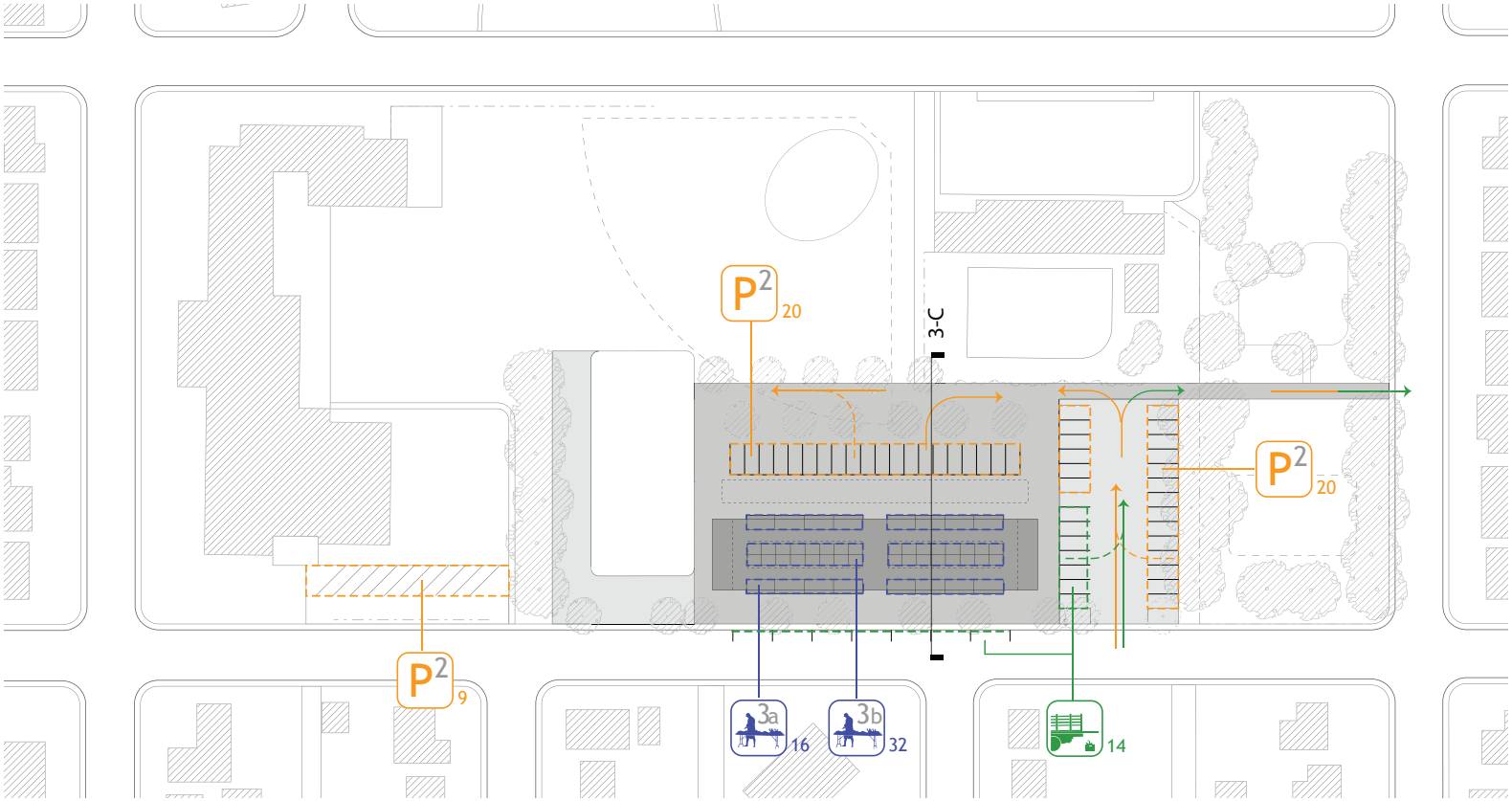
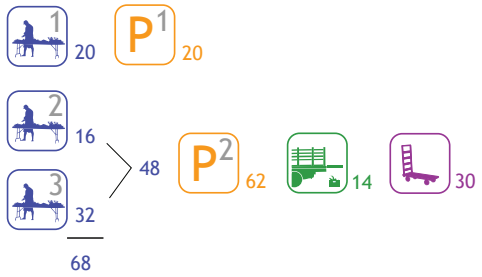


FIGURE 5.30 - Site Plan, Market System 3 - Winter Market System

Resulting Spring/Fall Market

In addition to a summer and winter market however, the added row of fabric canopies also makes viable an early spring/late fall configuration of the market. With the fully exposed back to back stalls along the north side removed, a row of direct access stalls becomes possible. Protected by vendor vehicles in the north, semi-enclosed stalls on the south, and fabric canopies above, a tempered microclimate is created - extending the use of this open-air space considerably. Combined with the fully-enclosed stalls of the main market building, the total capacity of the spring/fall market is about 68.

System Summary:



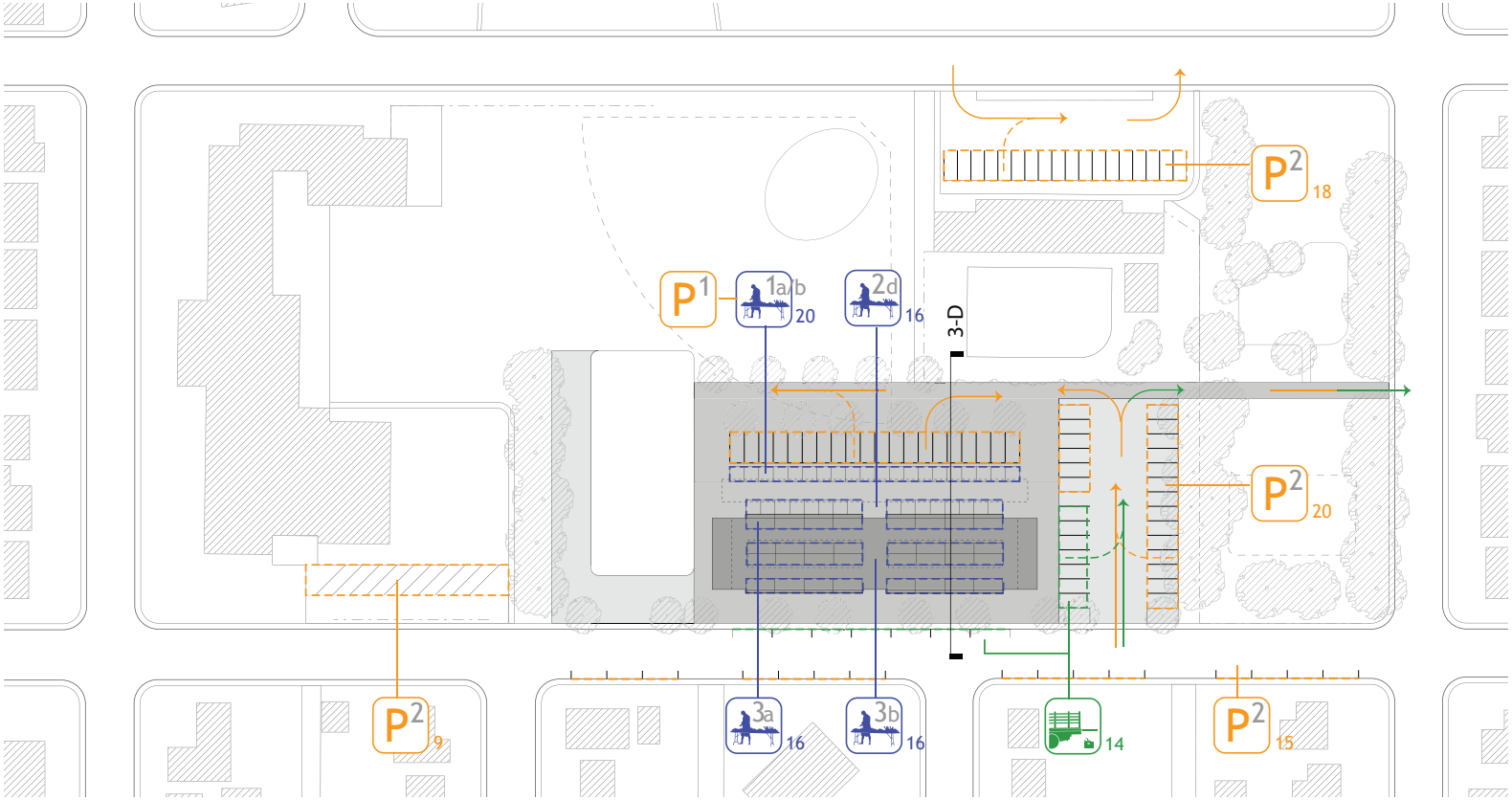


FIGURE 5.31 - Site Plan, Market System 3 - Spring/Fall Market System

Section 3-A

Market System 3
On a Non-Market Day

As a fully-enclosed winterized building, the central market space can now be used on non-market days year-round by any number of community groups or clubs for things such as meetings, trade fairs, conferences, etc. It is even possible that such a space be rented out for private parties, for with vendor spaces locked, and market carts and storage facilities relocated to storage areas at either end of the building the large open space is extremely versatile for large gatherings of any type.

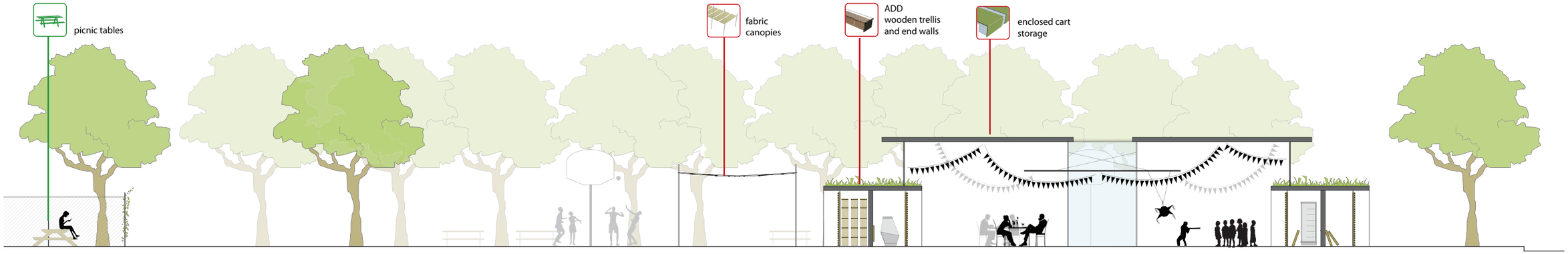


FIGURE 5.32 - Site Section, Market System 3 - Non-Market Day

Section 3-B

Market System 3
On a Summer Market Day

With hard surfacing extending from the main market building all the way to George Ward Pool, during the summer months two rows of exterior back-to-back stalls (one of which has electrical services and post holes; the other as “space allocation only”) can be comfortably accommodated. By utilizing these stalls in addition to all the exterior and interior vendor spaces provided by the main building, a market of significant capacity and density becomes a reality.

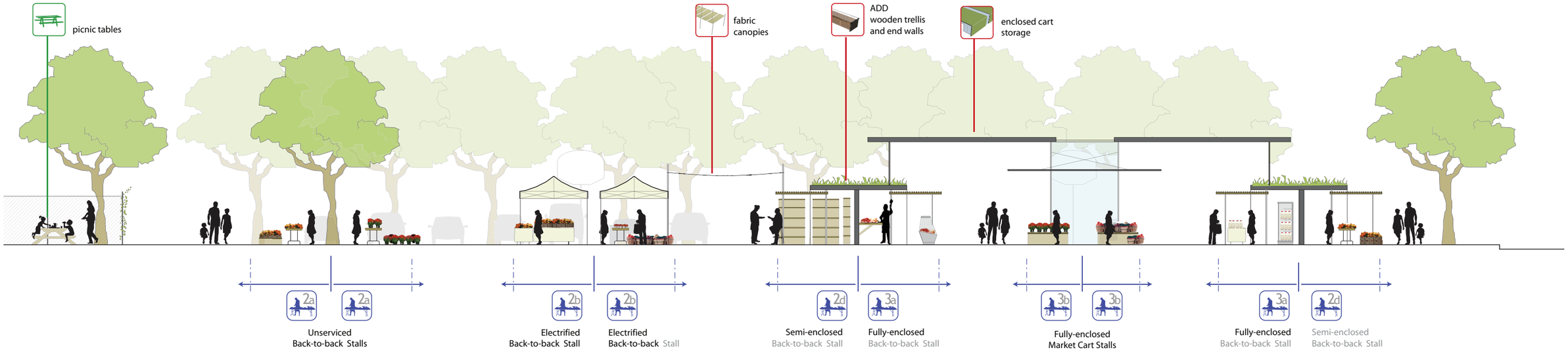


FIGURE 5.33 - Site Section, Market System 3 - Summer Market System

Section 3-C

Market System 3
On a Winter Market Day

With market carts once again relocated to storage at either end of the building, during the winter months the central market cart area can become the main vending space for fruit and vegetable producers (both having limited produce at this time of year), while the perimeter stalls provide secure storage for vendors requiring significant equipment and supplying significant capacity year-round - such as meat and dairy. With weather too inclement for any exterior stalls, the additional hard surfacing can be used for convenient vendor parking and drop-off areas.

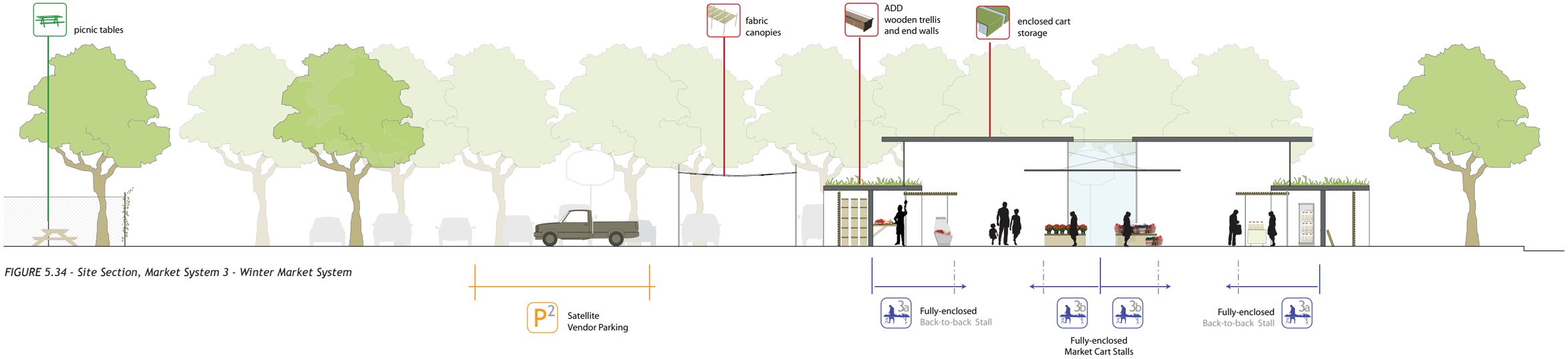


FIGURE 5.34 - Site Section, Market System 3 - Winter Market System

Section 3-D

Market System 3
On a Spring/Fall Market Day

Sheltered by a row of vehicles to the north, and opening up onto a covered pedestrian walkway to the south, a row of direct access exterior stalls has enough protection to be comfortable both very early and very late in the season. With the addition of propane lamps or heaters, it is possible that such a space could contribute to the capacity and amenity of the fully enclosed building well into fall, or very early in the spring. While not illustrated here, it is also possible that provided with some shelter, the row of semi-enclosed stalls facing the road may also become usable this time of year.

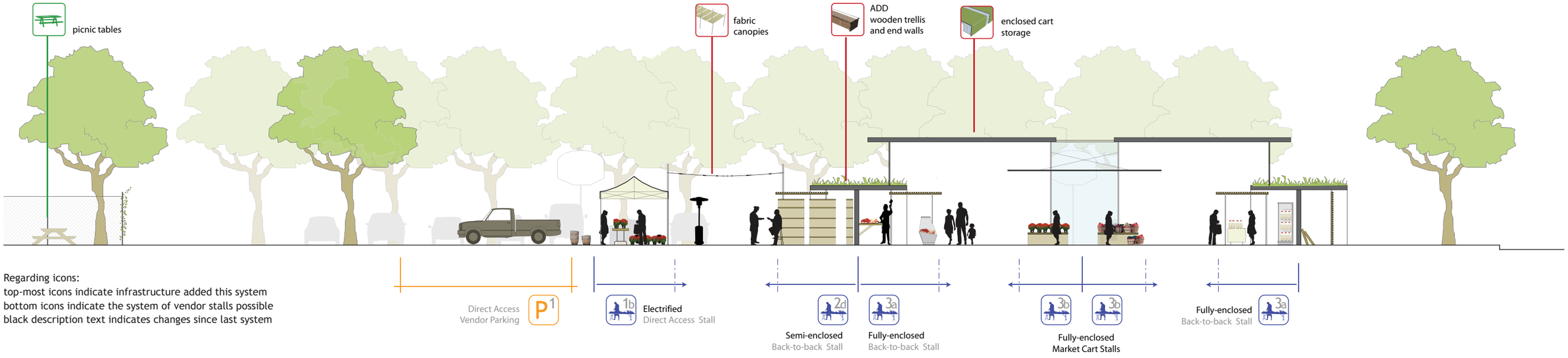


FIGURE 5.35 - Site Section, Market System 3 - Spring/Fall Market System

INFRASTRUCTURE REQUIRED

While Market System 3 was able to accommodate the full number of vendors required by the system during the summer months, it may eventually be desirable for the market to have a greater winter capacity as well. And so, in the final system, an additional row of semi-enclosed pavilions as well as another full building enclosure is added.

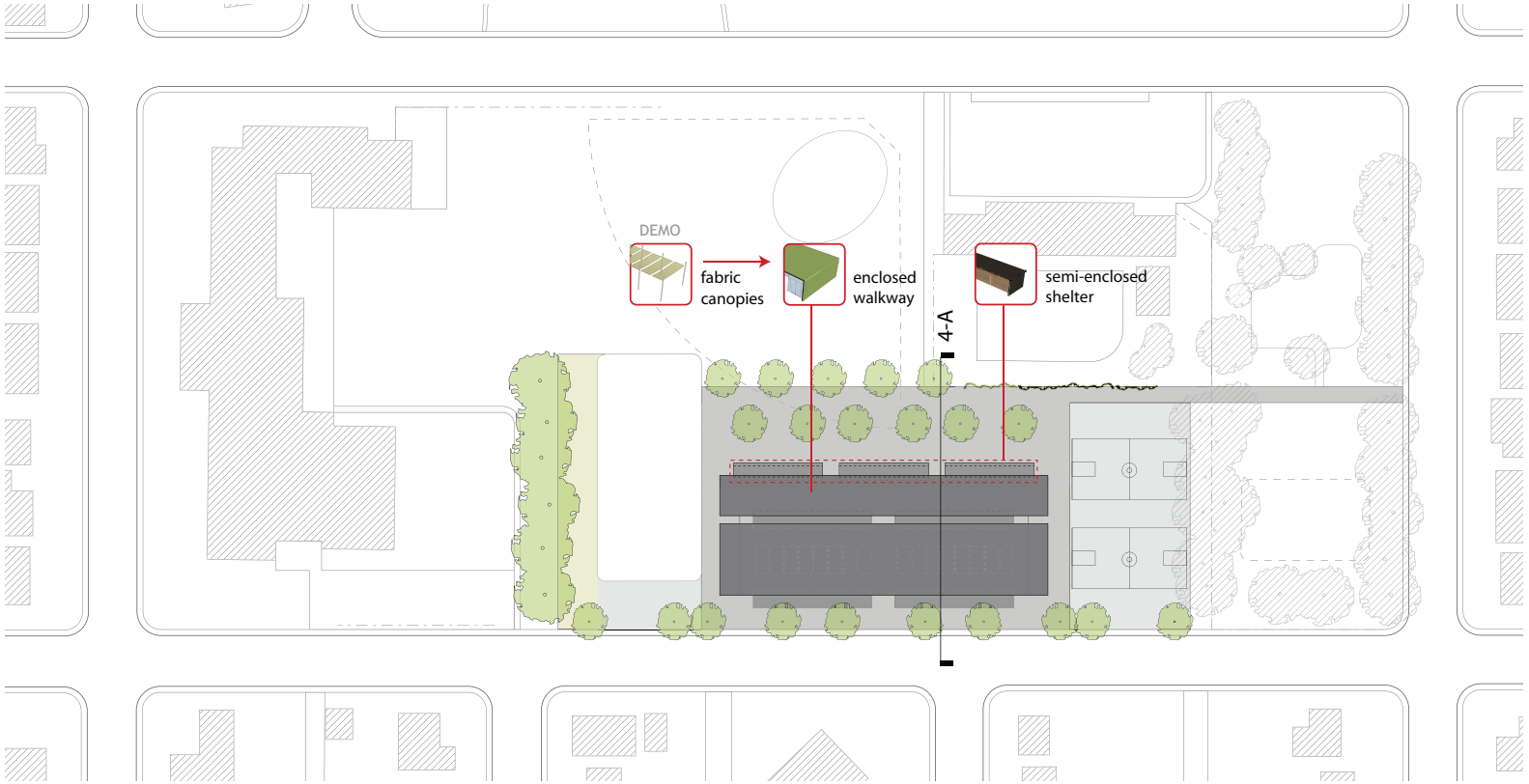
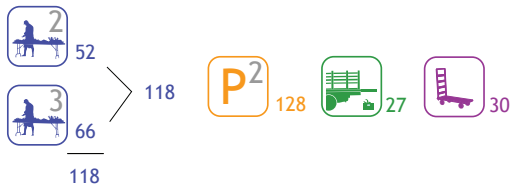


FIGURE 5.36 - Site Plan, Market System 4 - Infrastructure Required

Resulting Summer Market

While the total capacity of the resulting summer market remains at 118 (just as the summer market in System 3), the number of fully enclosed stalls has doubled - from 32 to 66. Again, nearby street parking will accommodate vendors not able to park on site, while substantial unloading areas are provided at either end of the market.

System Summary:



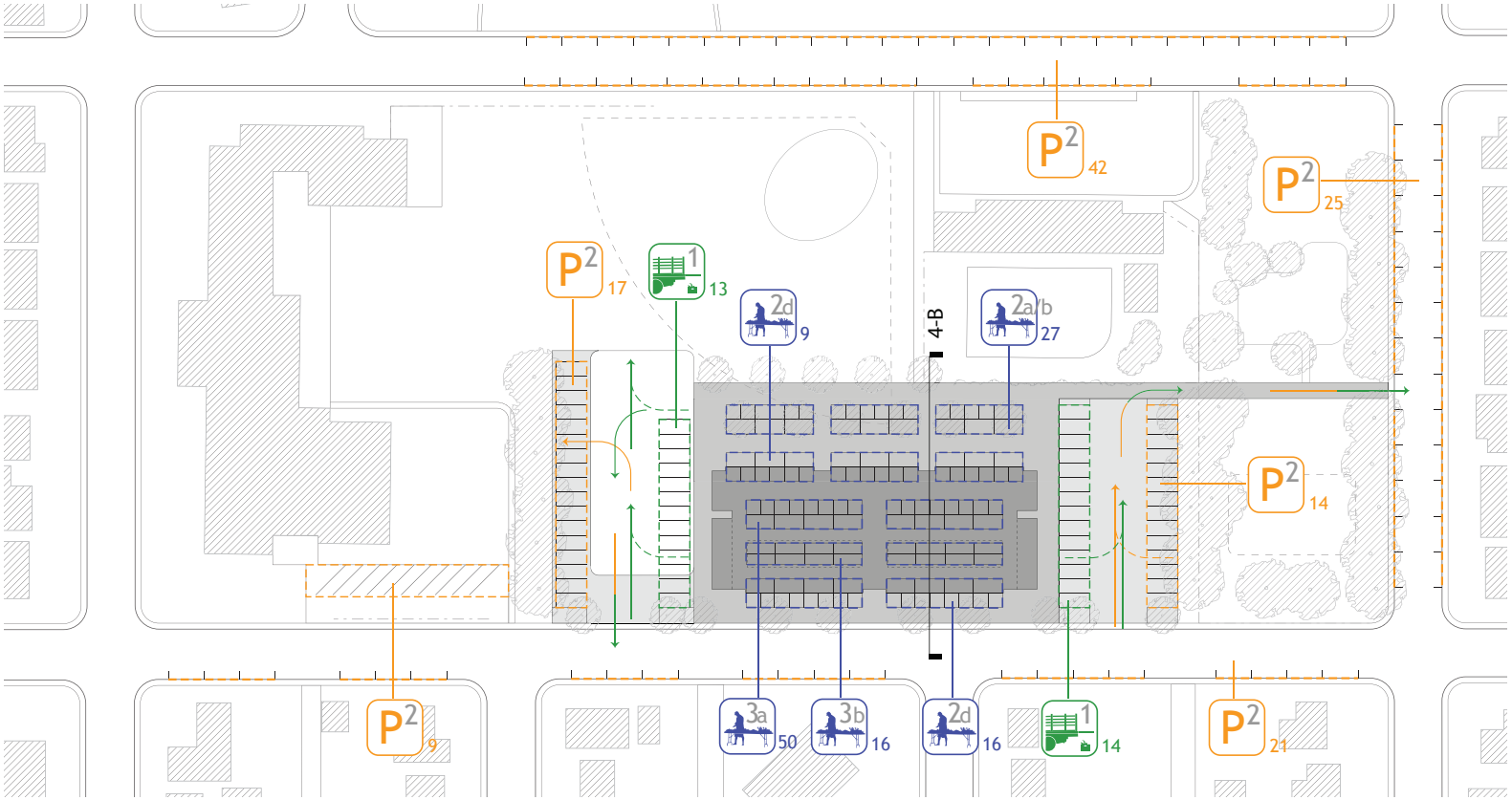


FIGURE 5.37 - Site Plan, Market System 4 - Summer Market System

Resulting Winter Market

By utilizing all four rows of interior stalls as well as the market cart area, 82 vendors can now be accommodated all winter long. While this may be slightly larger than is necessary (as is the case with the summer market as well), the extra capacity allows for some flexibility of use both in the northern-most pavilion as well as in the market cart area (see following diagrams and text).

System Summary:



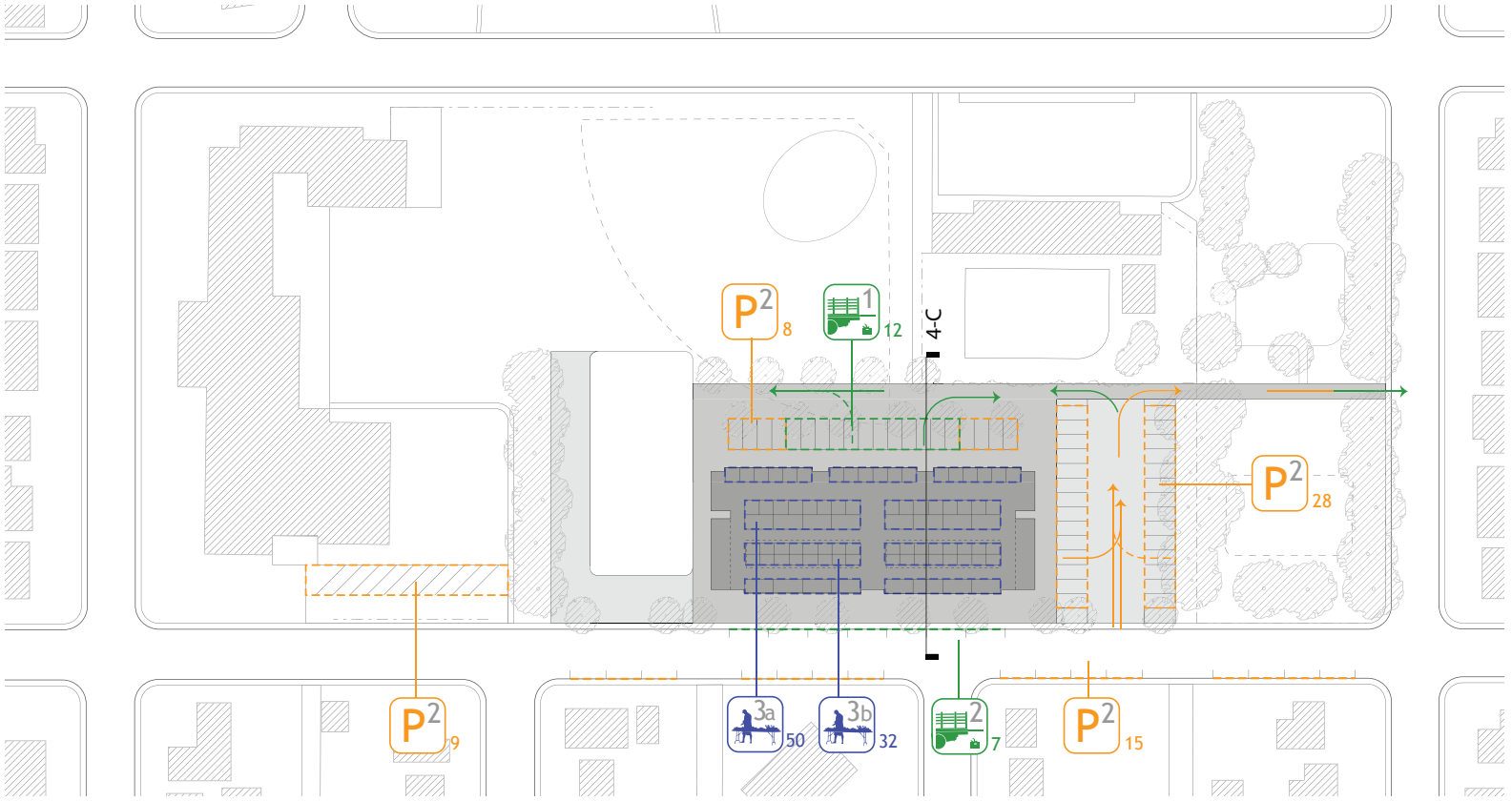


FIGURE 5.38 - Site Plan, Market System 4 - Winter Market System

Section 4-A

Market System 4
On a Non-Market Day

With vendor capacity significantly larger than what was originally called for (the market provides the equivalent of 168 12’0 x 12’0 spaces, while 130 12’0 x 12’0 spaces are required) it is possible that several of the spaces within the northernmost added pavilion could be appropriated for other functions related to increasing the community’s food security.

Outfitted with kitchen equipment, chalkboards, even food preserving and drying equipment, interior stalls could be used for cooking demonstrations or even used as community kitchens. At the same time, locked and accessed independently of the main market several exterior stalls could be used for storing equipment for nearby community gardens in the summer months, and community root cellars in the winter.

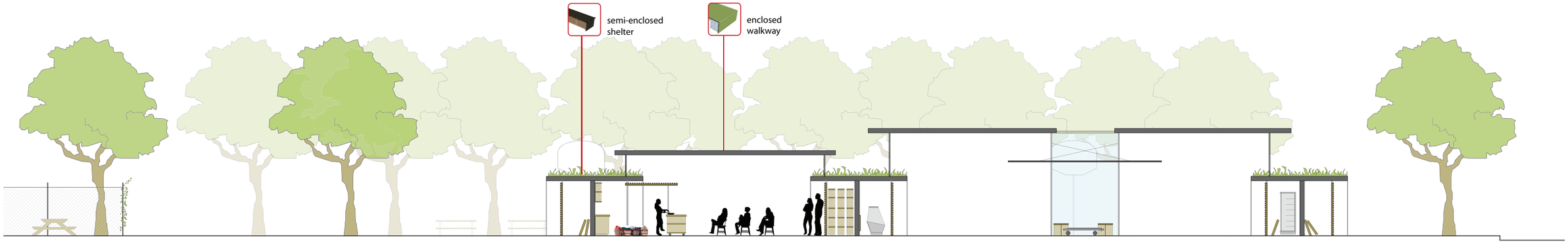


FIGURE 5.39 - Site Section, Market System 4 - Non-market Day

Section 4-B

Market System 4
On a Summer Market Day

Similar in extent to the summer market of System 3, when fully occupied, the final market stretches from 3rd Street all the way to George Ward Pool. With a capacity far in excess of what is required, it is imagined that in addition to some of the northern-most pavilions housing community functions, some of the stalls adjacent to the market cart area could be used for prepared foods and the like, while some of the market cart stalls used for informal dining and community gathering areas.

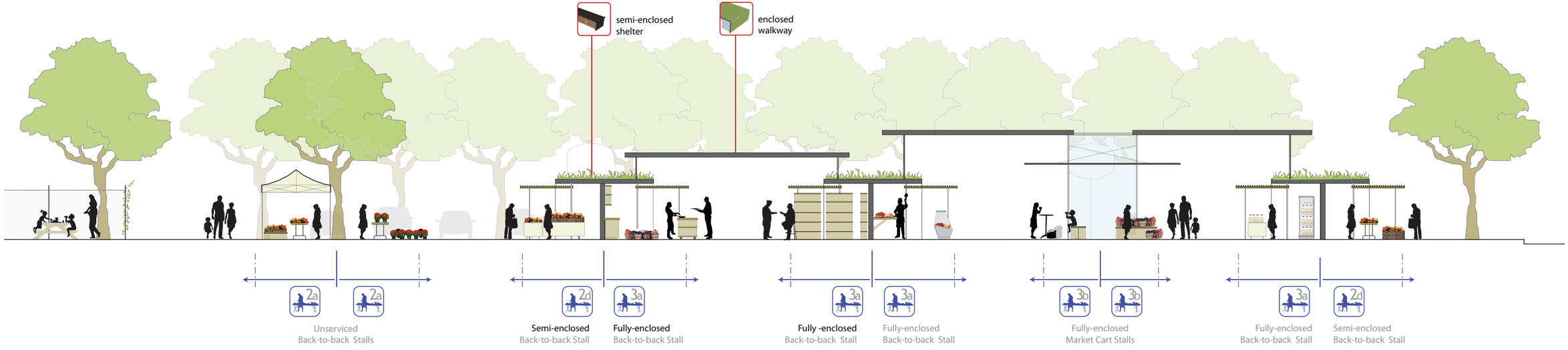


FIGURE 5.40 - Site Section, Market System 4 - Summer Market System

Section 4-C

Market System 4
On a Winter Market Day

With six rows of vendor stalls (four of which are fully serviced with secure storage) now fully enclosed, enough capacity exists that even in the winter it may be possible to leave some of the central market cart stalls open as a public amenity space. Outfitted with tall tables and some of the cart storage benches, the space can be used as an informal dining and meeting place for consumers, or left open to be used for other activities such as buskering and children's activities, just as in System 2.

In addition, it possible that the stalls outfitted with community-based facilities be used on market day as well; with community members demonstrating canning and preserving techniques, or rented to vendors in order to facilitate the sale of prepared foods made from wholesome, local ingredients.

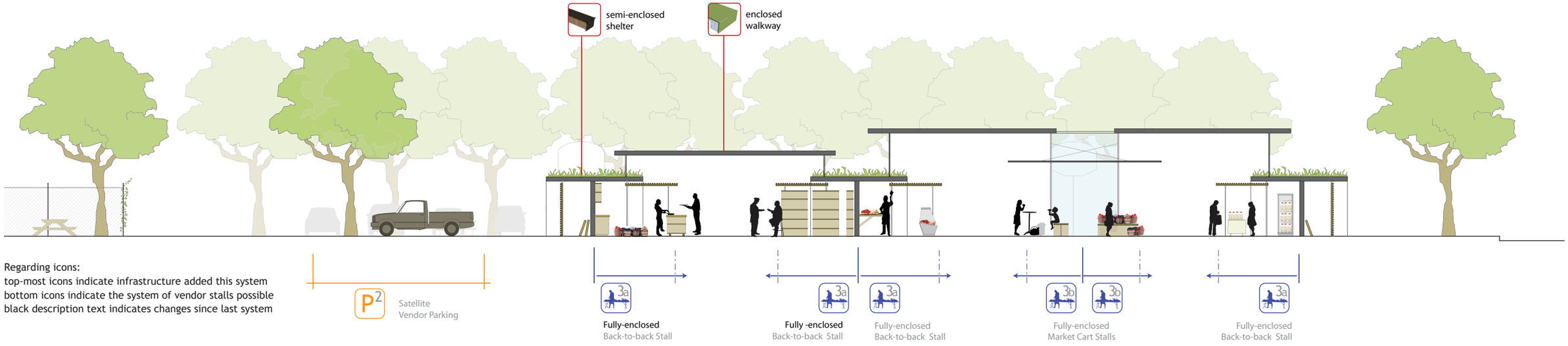


FIGURE 5.41 - Site Section, Market System 4 - Winter Market System

5.2 A Market for Breevort Park

In the case of Holliston Park it was assumed that neither financing nor producer/consumer capacity would be significant enough to make a 130-stall market viable from the outset, and so a system that grew in both in size and amenity was designed.

In the case of Breevort Park however, it has been assumed that interest/demand for locally grown foods has increased to the point as to make a full-sized market viable from the beginning. However, with the viability of *this* market, it has been assumed that many more of the proposed neighbourhood markets would be viable as well. And if the entire city followed a model similar to the one outlined for the South-East Sector, close to 50 such markets could be developed. Given this, it is safe to assume that limited financing will be available for any one market.

And so, the following design for Breevort Park explores the possibility of using the elements of the "kit of parts" to design a market that begins at full capacity, and then using an incremental investment model builds up the infrastructure and amenity of the system in its entirety over several years.

In order to do this, the following section is comprised of three main parts:

5.2_a The Market Site,
5.2_b The Developed System, and
5.3_c Potential Evolution.

5.2_a The Market Site

As one of the two “multiple main neighbourhood park” nodes within the sector, there is a considerable amount of under-utilized space that could be ideal for locating a market within the 20-acre Breevort Park. Bordering the major street of Early Dr., and directly adjacent to Breevort Park Elementary, the south west corner of Breevort Park North has been identified an ideal market location.

In addition to being the most visible area of the park, from this location it is possible that visual as well as physical connections could be made back to the baseball diamond and skating rink, while the existing lane behind Salisbury Dr. could also be utilized for circulation of vendor vehicle traffic.



FIGURE 5.42 - Site Plan, A Market for Breevort Park

5.2_b The Developed System

As discussed earlier, the assumption for this market was that consumer demand and producer capacity were both large enough to be able to support a 130-stall market from the beginning. And so, utilizing the previously developed "kit of market parts" the following section outlines a market system with the capacity to accommodate all 130 12'0 x 12'0 stalls as well as the other infrastructural pieces necessary to provide market functions.



FIGURE 5.43



Vendor Stalls

Using the back-to-back system, 5 rows of 28 stalls would accommodate the equivalent of 140 12’0 x 12’0 stalls, fewer than the final market in Holliston Park, but more than enough to accommodate the vendors required.



FIGURE 5.44



Market Carts

Centrally located, one row of market carts and their associated furniture provides storage for up to 42 market carts, accessible from entire market perimeter.

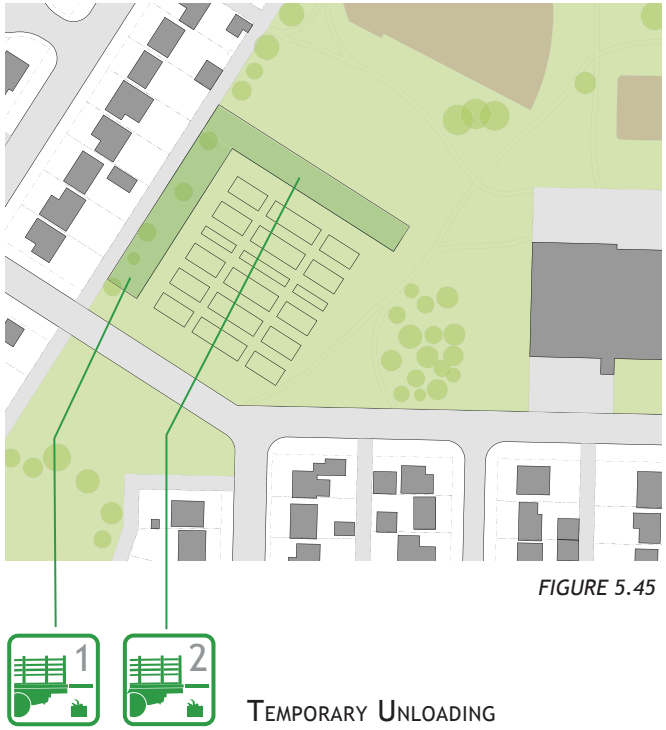


FIGURE 5.45

Temporary Unloading

Combined with a one-way traffic system that utilizes Salisbury Lane and the satellite vendor parking (see Figure 5.46) two zones of temporary unloading (one “back-in” and one “parallel” style) around the perimeter of the market allow 26 vendors to simultaneously unload (or reload) their trucks.



FIGURE 5.46



FIGURE 5.47



Satellite Vendor Parking

Utilizing angle parking and a one-way traffic system, parking for approximately half of the 120 required vendors can be accommodated on-site. It is imagined that street parking as well as parking at nearby institutions could accommodate the rest within a relatively close proximity.



Vendor Overflow Space

A significant set back from the street, as well as the hard surfaced temporary unloading area to the north of the main market area allow for additional market vendor space if/when necessary.

When the space is not required for vendors, public furniture allows for these two areas to be used informally for public gathering, picnicking, buskering, etc.

The Resulting Site Plan

Utilizing a mere 2.9 of the park's 22 acres, a 130-stall market with a significant amount of vendor parking, temporary unloading space as well as market cart storage can be accommodated without affecting any of the park's previous functions.

In addition to this, the planting of large shade trees together with public furniture and a surface large enough to accommodate a basketball court add to the public amenity of the space considerably.



FIGURE 5.48 - Site Plan, A Market for Breevort Park

5.2_c Potential Evolution

While it is possible that Breevort's market remain a fully exposed, seasonal market only, it is anticipated that with such significant producer and consumer capacity, there will be the desire for an increased level of infrastructure and permanence as well, however with little capital available this becomes difficult.

And so, using the levels of "enclosure" outlined in the previous "kit of parts" the following series of diagrams illustrates a potential evolution of the market over several years. Beginning with "space allocation only" and ending with the addition of "enclosed cart storage" the following illustrates at the simplest level how the "enclosure" elements could be used to incrementally build the infrastructure of a market bit by bit as financial support becomes available.

Year 1: Space Allocation Only

With investment capital at a minimum, for the market's first year, vendor stalls are simply defined with chalk lines drawn on the sod. Vendors are responsible for bringing their own tables, shelter and any other equipment they require.

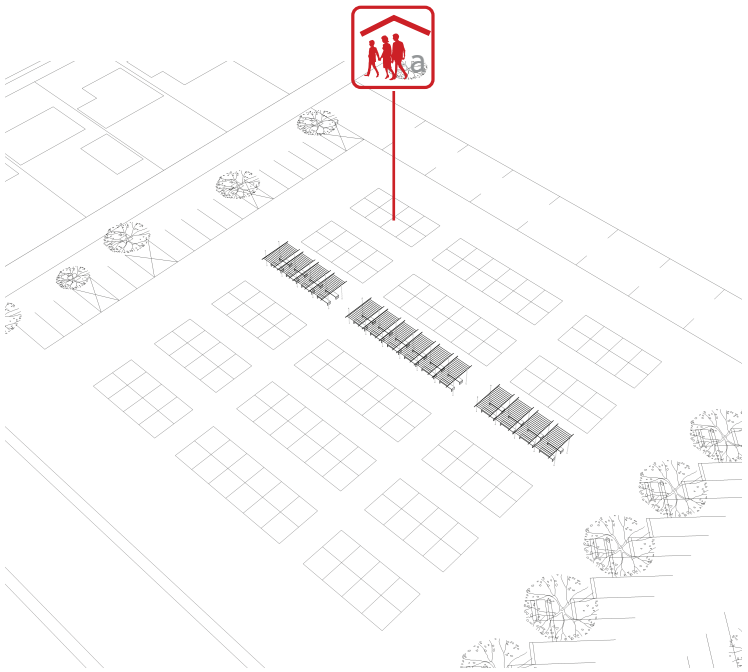


FIGURE 5.49 - Breevort Market, Year 1

Year 2: Electricity and Post Holes

With nearly every vendor bringing a shelter of some sort, post holes are added to every stall during the market's second year, in order to make securing such shelter much easier. In addition, electrical services are added to three rows of stalls in order to make easier the selling of foodstuffs needing to be kept hot or cold.

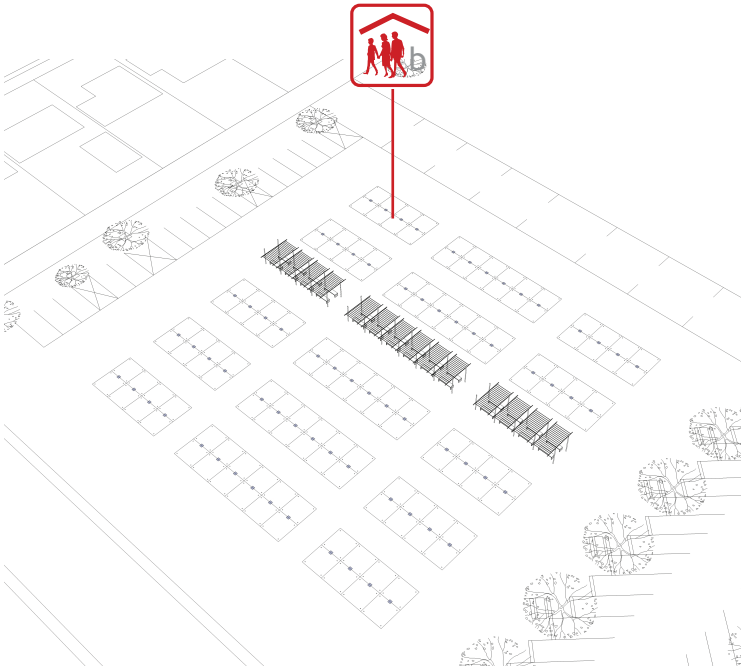


FIGURE 5.50 - Breevort Market, Year 2

Year 3: Open-air Pavilions

Since all vendors would greatly appreciate permanent shelter, and since after several years of operation a significant amount of support has been generated for the market, open-air pavilions are added to all five rows of vendor stalls by year 3.

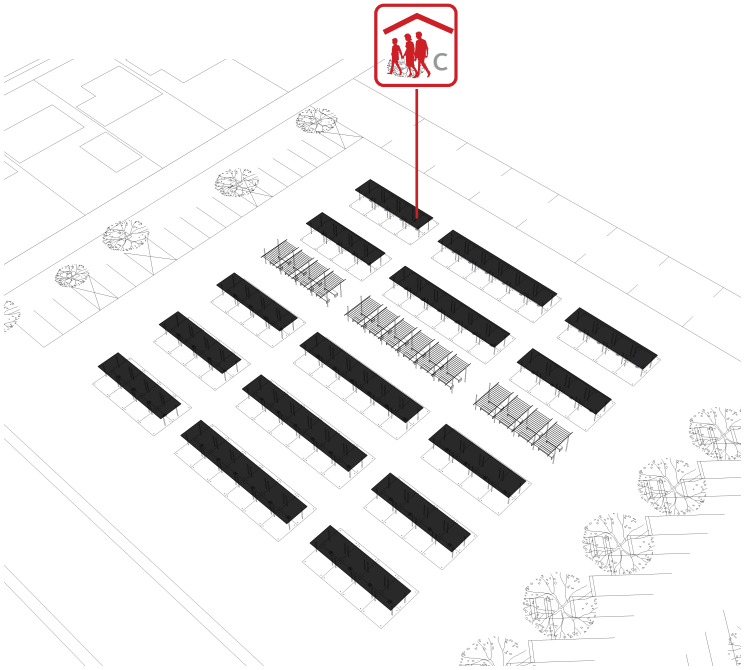


FIGURE 5.51 - Breevort Market, Year 3

Year 4: Enclosed Shelter and Storage

By year 4 enough money has generated to be able to enclose 3 of the 5 open-air pavilions. This seems more than adequate as not all vendors require on-site storage, and many are comfortable enough with the level of protection provided by retractable awnings of the open-air structures.

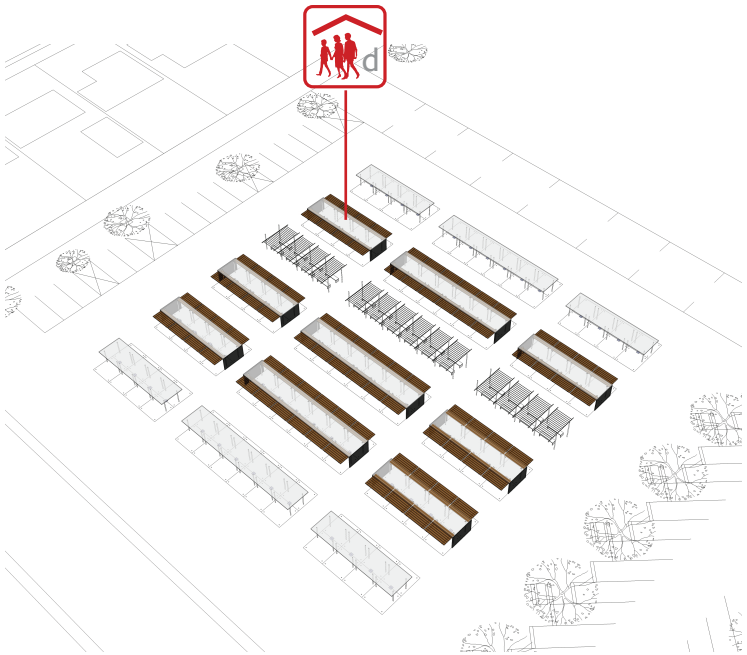


FIGURE 5.52 - Breevort Market, Year 4

Year 5: Fabric Canopies

In anticipation of eventually enclosing part of the market with a full building, only two of the five pedestrian walkways become covered with fabric canopies. Since it is anticipated that customers may linger longer in these more comfortable spaces, the two outermost walkways are covered in order to make visible from the street and the park the greatest intensity of social interactions.

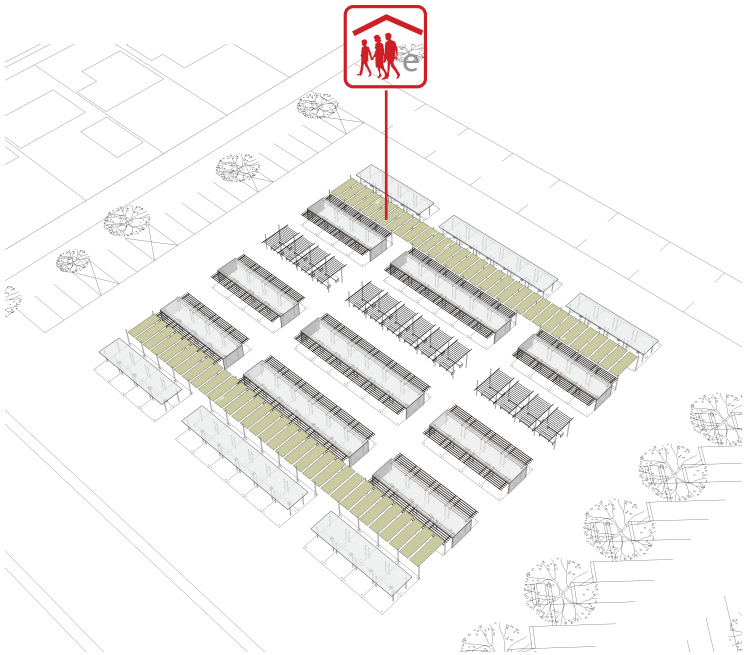


FIGURE 5.53 - Breevort Market, Year 5

Year 7: Enclosed Building

By year 7, enough money and interest has been generated to enclose part of the market. In order to build both vendor and customer capacity for a winter market, only one pedestrian walkway is transformed into a fully enclosed building, initially. Located in close proximity to the street, but behind a row of open-air pavilions and a canvas-covered pedestrian walkway allows it to be seen from the street, while still exposing many layers of stalls and interactions that will be visually very exciting on a market day.

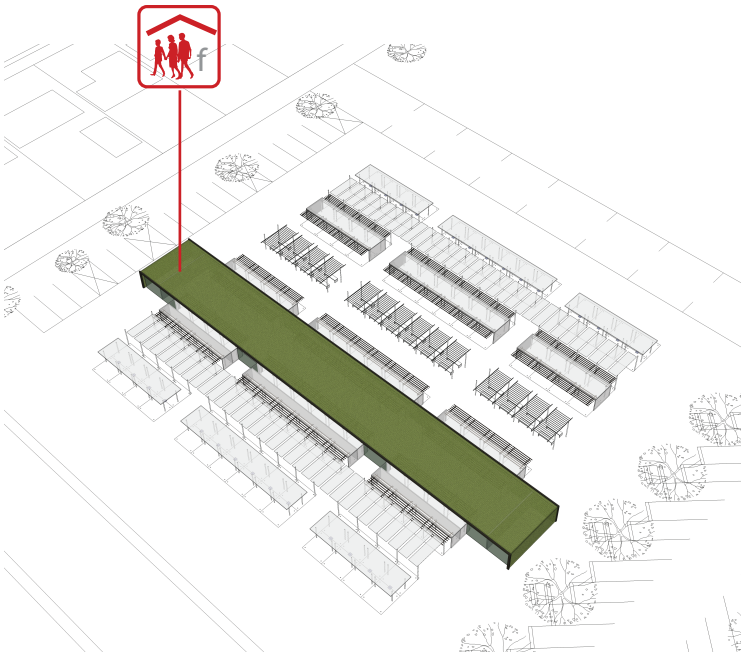


FIGURE 5.54 - Breevort Market, Year 7

Year 10: Enclosed Cart Storage

As both producer and consumer capacity for the winter market grows, demand for a larger enclosed space increases, and so, by year 10 the cart storage area of the Breevort market is also enclosed. Located adjacent to the previously enclosed pedestrian walkway, one large building can now accommodate a substantial winter and summer market.

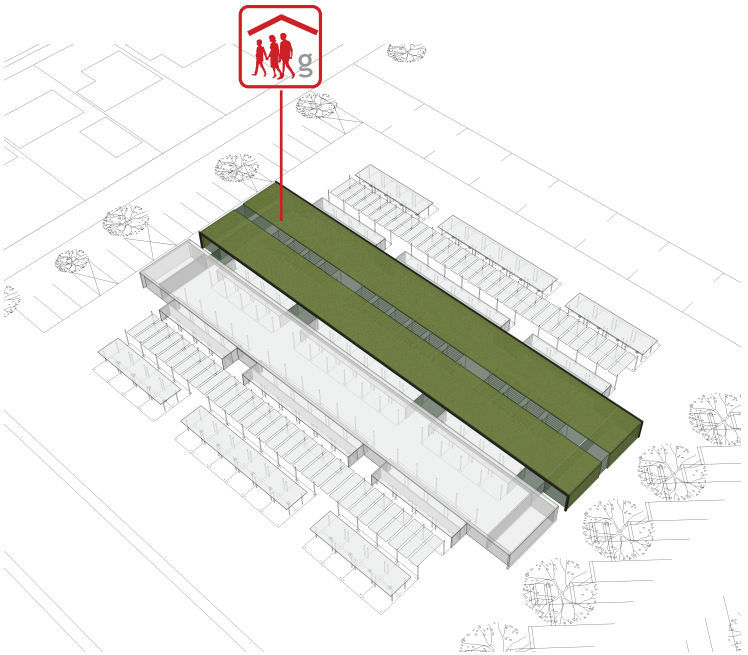


FIGURE 5.55 - Breevort Market, Year 10

The Final Market

And so, in this way, it is imagined that after 10 years, a year-round market with the capacity to provide the Breevort community 80 percent of its food-stuffs could be built.

It is worth noting that the “final” version of the market does not see every vendor stall enclosed. For even if the community was relying on local food-stuffs for the majority of their diet all year-round, many of the vendors (vegetables mostly) would most likely only be present at the market throughout the summer months. And so, the market has been designed such that it can expand and contract with the seasons.

In the summer when minimal enclosure is required and vendor numbers are highest the market extends the full site. However, as the weather gets colder and vendors fewer, the market begins retracting to center of site; the winter market comprising solely of the centrally-located fully-enclosed interior volumes.



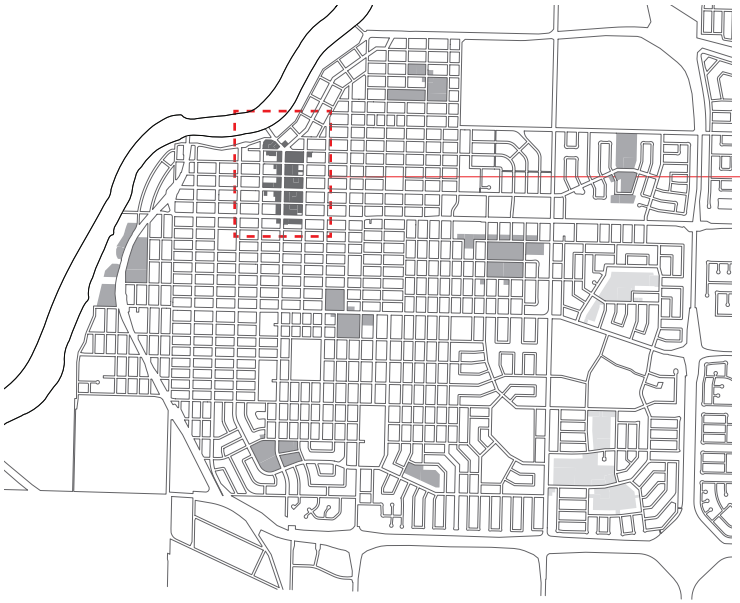
FIGURE 5.56 - The Final Breevort Market

5.3 Confirming the Capacity of the other Eight Nodes

While Section 5.1 and 5.2 demonstrated the ability of two parks within the sector to accommodate a market of adequate size and organization, the following exercise was undertaken in order to confirm that such a market would indeed be possible within the other eight nodes as well.

In order to do this, the pattern of vendor stalls and markets carts developed through the previous two designs have been schematically laid out on every node. Due to time restrictions, vendor parking as well as unloading areas have not been investigated, however it is recognized that these components will also requires some surface area if an inadequate amount is available on nearby streets and existing lots of other buildings.

It is worth noting that in high density contexts such as Broadway Avenue, it may be possible that a large portion of the market's vendors be set up on a side street that is temporarily closed. Not only would this prevent the rather limited amount of open space in the area from being developed, but would also contribute significantly to the mixed-use small-scale commercial area already existing on Broadway Avenue (see Figure 5.57 and related caption). Besides this, the other 7 nodes seem to lend themselves quite well to configurations similar to Breevort or Holliston Park.



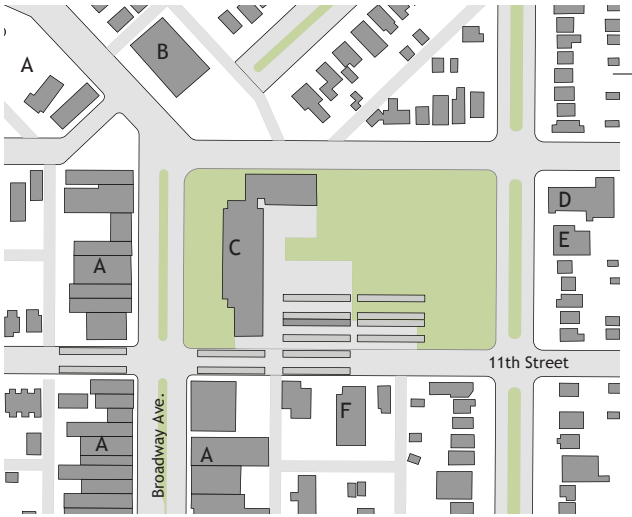


BROADWAY AVENUE NODE

"mixed-use retail" node

"medium-sized neighbourhood park" node

"large neighbourhood park" node



A_ Mixed-use Commercial Area

B_High-density Residential Unit

C_ Victoria Elementary School

D_St James' Anglican Church

E_Refinery Arts and Spirit Centre

F_Cosmopolitan Senior's Centre

Figure 5.57 - Testing the Capacity of Broadway Avenue

In contrast to the other nine market sites, Broadway Avenue node does not feature a substantial public park and so, a much different market footprint has been imagined. With the energy of this node coming from retail activity on Broadway Ave, a number of stalls (60 as drawn) could be located along 11 Street, which would be temporary closed; while another 70 stalls as well as market carts could utilize much of the hard-surface already existing behind Victoria Elementary. In this case it is imagined that the stalls along the street would remain temporary, while those on the grounds of the school could be the focus of increasing levels of infrastructure.

A _ Student Residence and Cultural Centre

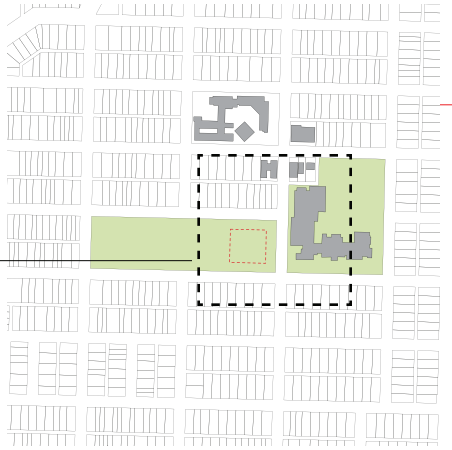
B _ Small-scale Commercial

C _ Brunskill Elementary

D _ Kinsmen Children's Centre

E _ President Murray Park



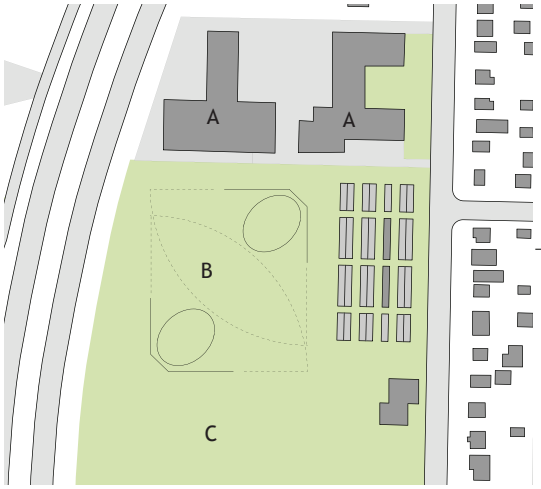


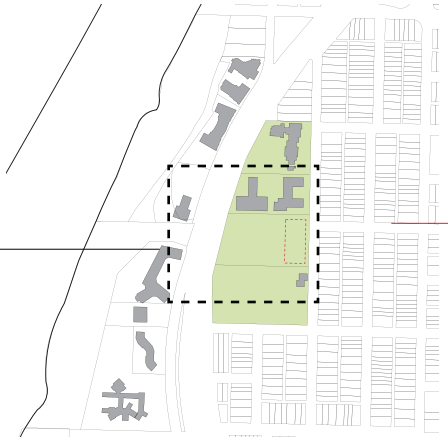
President Murray Park Node

A _ Saskatchewan Abilities Council

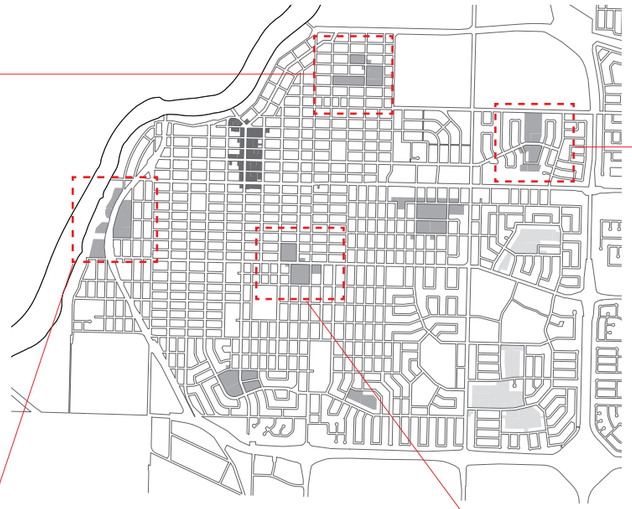
B _ Atchison Field

C _ Kilburn Park





Kilburn Park Node



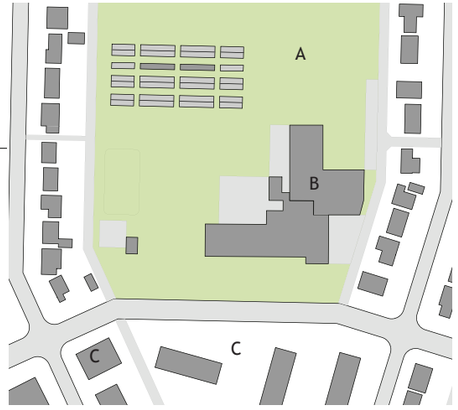
“mixed-use retail” node

“medium-sized neighbourhood park” node

“large neighbourhood park” node



GREYSTONE PARK NODE



A _ Greystone Park

B _ Greystone Heights Elementary

C _ Medium-density Residential



W.W. ASHLEY PARK NODE



A _ Saskatoon Public Library

B _ Lathey Public Pool

C _ W.W. Ashley Park

D _ Fellowship Baptist Church

E _ Firehall

F _ Aden Bowman Collegiate

FIGURE 5.58 - Testing the Capacity of President Murray, Kilburn, Greystone and W.W. Ashley Park

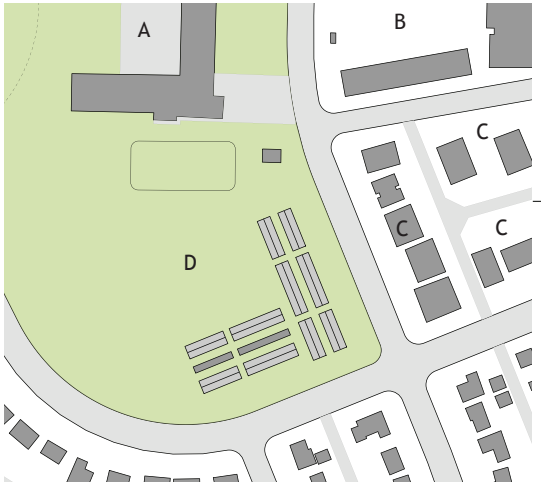
While the configuration of President Murray Park will allow for a system similar to Breevort Park, the scale and arrangement of Kilburn, Greystone and W.W. Ashley Parks may be better suited to a longer, less deep market. At 128 stalls, this footprint has slightly less capacity then both Holliston and Breevort, however still accommodates the required number vendors along with a substantial number of vendor carts.

A _ John Lake Elementary School

B _ Avalon Shopping Centre

C _ Medium-density Residential

D _ John Lake Park

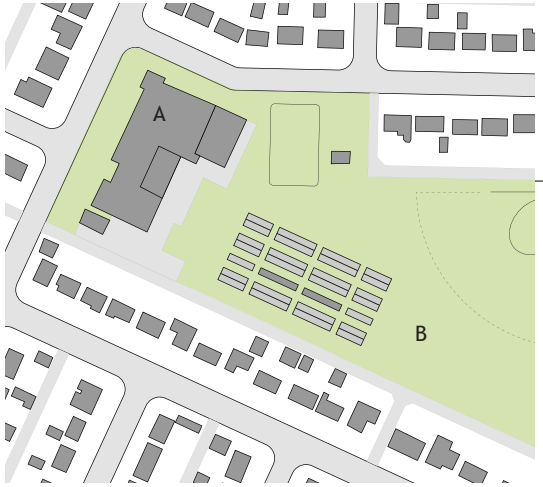


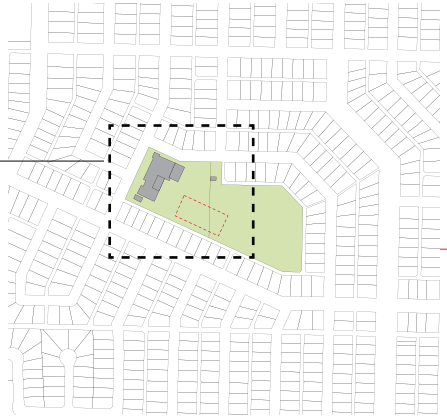


JOHN LAKE PARK NODE

A _ Hugh Cairns Vocational School

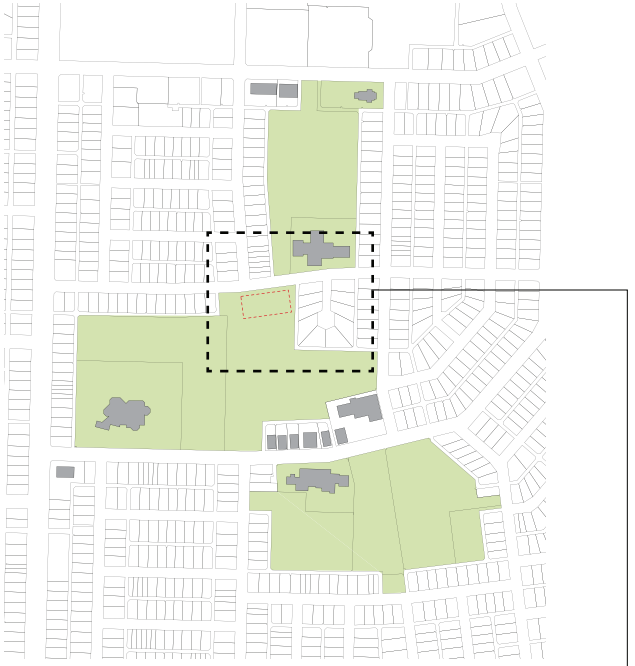
B _ Adelaide Park



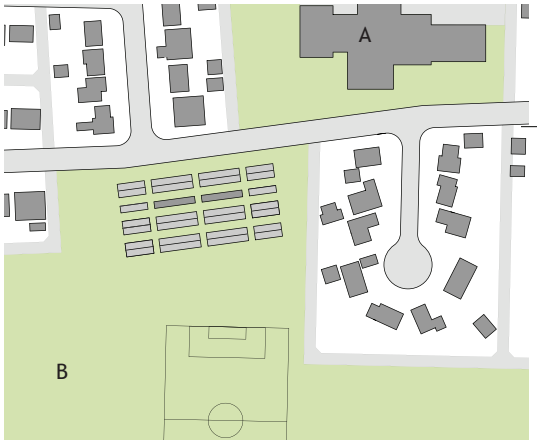


ADELAIDE PARK NODE





JAMES ANDERSON PARK NODE



A _ Alvin Buckwold Elementary School

B _ James Anderson Park

FIGURE 5.59 - Testing the Capacity of John Lake, Adelaide, and James Anderson Park

While the previously mentioned longer, narrower market footprint suits Adelaide and James Anderson Parks, the configuration of John Lake Park on the corner of two major streets, may warrant a market pattern that addresses both streets. As drawn, the capacity of such a market would be 136.

Conclusion

By realizing a system of small-scale natural-systems-based production, rural processing/support, neighbourhood farmers markets, and urban support facilities for one rural and one urban community on the Canadian Prairies, this thesis attempted to do several things. First of all, illustrate the capacity required of local, small-scale food systems if in fact they were relied upon to deliver 80 percent of the foodstuffs required by urban and rural communities on the Prairies. Secondly, develop a very viable, economically reasonable, and easily executable framework upon which this system could built, and thirdly demonstrate the ability of said system to not only contribute to the building of food security for both rural and urban communities, but the building of socially prosperous rural and urban communities as well.

In order to do this, several exercises were undertaken. First of all, using models of contemporary working farms from across North America, "adapted" to the Saskatchewan context, a system of production was outlined that would not only be able to provide all the temperate fruit, vegetables, grains and cereals, red meat, poultry, dairy, and eggs, required by one rural and one urban community on the Prairies; but if proliferated throughout the Rural South-East Sector could provide said foodstuffs for one-sixth the city and its surrounding hinterland; and likewise, if adopted throughout the entire 150 km foodshed, could provide 80 percent of the entire city's food supply.

Following this, and again utilizing models that are being employed successfully elsewhere in the world, a system of small-scale processing and support was envisioned for the town of Craik and its surrounding rural hinterland. Through a series of schematic site plans and gestural renderings, an attempt was made to illustrate how this infrastructure could not only be easily accommodated within the town, but located and developed in such a way that it would be able to build upon, rather than detract from, the community-building infrastructure already existing within the town, contributing significantly to the economic as well as social vitality of the town itself (and by extension many other towns throughout foodshed) as well as its surrounding rural hinterland.

And lastly, by developing a market system for the community of Holliston Park that could “start small”, and evolve alongside producer and consumer capacity to the point that it would be able to accommodate both the foodstuffs and producers required to deliver this 80 percent of foodstuffs to urban communities year-round, this thesis attempted to illustrate the ability of a network of farmers’ markets to not only provide a cost-effective, and enjoyable way to distribute these foodstuffs to all urban communities; but by locating such markets in near proximity to other community institutions such as schools and churches, demonstrate that they could also provide the locus for the building of socially prosperous urban communities as well.

It is worth re-iterating that it was never the intention of the previously outlined system to be the realization of a complete local food system for either the town of Craik and its surrounding rural area, or the neighbourhood of Holliston Park. Recognizing the grass roots nature of many local food initiatives, combined with the ability of some of these initiatives to act as catalysts for the development of others, this thesis attempted to present a necessarily limited system. For in this way, not only would be possible to calculate the approximate capacity required by such systems in a reasonable amount of time; but it would also result in a framework of key capacity-building initiatives that could be easily implemented by rural and urban policy makers alike.

And so, by demonstrating the ability of these key "capacity-building initiatives" (i.e. a network of rural processing/support centers in the rural area, and neighbourhood farmers' markets in the urban area) to not only support the growth of a sustainable, healthy and enjoyable food system, but the growth of socially (and economically in the case of rural communities) prosperous rural and urban communities, it is the hope that this thesis will inspire policy makers not only in Saskatoon and its surrounding hinterland, but across the Canadian Prairies, to begin making the changes necessary in order to not just *allow*, but in fact *promote and establish* the foundation upon which varied, robust and sustainable local food systems can be built for all Prairie communities.

References

Main References

Ableman, Michael. *Fields of Plenty: A Farmer's Journey in Search of Real Food and the People Who Grow it*. San Francisco: Chronicle Books, 2005.

Bekerman, Anna, and Anne Freeman. "The Dufferin Grove Organic Farmers' Market: One Model for an Urban, Park-based Market." Publication made available through Friends of Dufferin Grove Park website, March 2007. http://dufferinpark.ca/market/pdf/Farmersmkthandbkcorrectorder.pdf

Berry, Wendell. *The Unsettling of America: Culture & Agriculture*. San Francisco: Sierra Club Books, 1977.

Carson, Rachel. *Silent Spring*. Boston: Houghton Mifflin Company, 1962.

Eisen, Jill, producer. *Organics Goes Mainstream*. Audio documentary produced for CBC Radio Program "Ideas." Toronto: Canadian Broadcasting Corporation, 2006. http://www.cbc.ca/ideas/transcripts/s.html.

Eisen, Jill, producer. *Slow Food*. Audio documentary produced for CBC Radio Program "Ideas." Toronto: Canadian Broadcasting Corporation, 2003. http://www.cbc.ca/ideas/transcripts/s.html.

Fukuoka, Masanobu. *The One-Straw Revolution: An Introduction to Natural Farming*. Edited by Larry Korn. Emmaus: Rodale Press, 1978.

Halweil, Brian. *Eat Here: Reclaiming Homegrown Pleasures in a Global Supermarket*. New York: W.W. Norton & Company, 2004.

Heinberg, Richard. *Powerdown: Options and Actions for a Post-Carbon World*. Gabriola Island B.C.: New Society Publishers, 2004.

Howard, Albert, Sir. *An Agricultural Testament*. London: Oxford University Press, 1940.

Katz, Sandor Ellix. *The Revolution Will Not Be Microwaved: Inside America's Underground Food Movements*. White River Junction, VT: Chelsea Green Publishing Company, 2006.

Kimbrell, Andrew, editor. *Fatal Harvest: The Tragedy of Industrial Agriculture*. Washington: Foundation for Deep Ecology with Island Press, 2002.

Kingsolver, Barbara. A*nimal, Vegetable, Miracle: A Year of Food Life*. New York: HarperCollins Publishers Ltd, 2008.

Lappé, Frances Moore. *Diet for a Small Planet*. New York: Ballantine Books, 1982.

Lister, Nina Marie. "Placing Food." In *Food*, edited by John Knechtel, 149-185. Cambridge, Mass: MIT Press, 2008.

Manning, Richard. *Against the Grain: How Agriculture has Hijacked Civilization*. New York: North Point Press, 2005.

Manning, Richard. *Food's Frontier: The Next Green Revolution*. New York: North Point Press, 2000.

Norberg-Hodge, Helena, Merrifield, Todd and Gorelick, Steven. *Bringing the Food Economy Home: Local Alternatives to Global Agribusiness*. London: Zed Books, 2002.

Ostrom, Marcia Ruth. "Community Supported Agriculture as an Agent of Change: Is it working?" In *Remaking the North American Food System: Strategies for Sustainability*, ed. C. Clare Hinrichs and Thomas A. Lyson, 99-120. London: University of Nebraska Press, 2007.

Pfeiffer, Dale Allen. *Eating Fossil Fuels: Oil, Food and the Coming Crisis in Agriculture*. Gabriola Island, B.C.: New Society Publishers, 2006.

Pollan, Michael. *The Omnivores Dilemma: A Natural History of Four Meals*. New York: The Penguin Press, 2006.

Pollan, Michael. *In Defense of Food: An Eater's Manifesto*. New York: The Penguin Press, 2008.

McFadden, Steven. "Community Farms in the 21st Century: Poised for Another Wave of Growth?" Published online at Rodale Institute. Accessed November 2011. http://newfarm.rodaleinstitute.org/features/0104/csa-history/part1.shtml

Russell, Julian, and Tony Gailey, codirectors. *Global Gardener: Permaculture with Bill Mollison*. DVD/VHS made available through Bullfrog Films. Australia: 220 Productions, 1991.

Salatin, Joel. *Everything I Want to Do is Illegal: War Stories from the Local Food Front*. Swoope, Virginia: Polyface Inc., 1995.

Salatin, Joel. *$alad Bar Beef*. Swoope, Virginia: Polyface Inc., 1995.

Salatin, Joel. *You Can Farm: The Entrepreneur's Guide to Start and $ucceed in a Farming Enterprise*. Swoope, Virginia: Polyface Inc., 1998.

Smith, Alisa and MacKinnon, J.B. *Plenty: One Man, One Woman, and a Raucous Year of Eating Locally*. New York: Harmony Books, 2007.

Springbett, David, producer/director. *Hijacked Future*. Victoria, B.C.: Ashnan Films, 2008.

Tangires, Helen. *Public Markets*. New York: W.W. Norton in Association with Library of Congress, 2008

References Specific to the Prairies

Bantjes, Rod. *Improved Earth: Prairie Space as Modern Artefact, 1869-1944*. Toronto: University of Toronto Press, 2005.

Brown, J.A., chairman, Jonsson, J.O., vice-chairman, with Archer, R., Dalidowicz, M., Drope, B., Hamlin, T., Leitch, D., Mullion, J., Parsons, E., and D. Webster. *Strategy for the Development of Rural Saskatchewan: Report of the Task Force on Rural Development*. Saskatchewan: Government of Saskatchewan, 1985.

Butler, Sir William Francis. *The Great Lone Land: A Narrative of Travel and Adventure in the North-west of America*. Edmonton: M.G. Hurtig Ltd., 1968.

Callenbach, Ernest. *Bring Back the Buffalo!: A Sustainable Future for America's Great Plains*. Berkeley: University of California Press, 2000.

Delainey, William P. and Sarjeant, William A.S. *Saskatoon: The Growth of a City*. Saskatoon, SK: Saskatoon Environmental Society, 1975.

Fung, Ka-iu, dir. and edit., Barry, Bill, ass. edit, and Wilson, Michael ass. edit. *Atlas of Saskatchewan: Celebrating Saskatchewan 2000-2005*. Saskatoon, SK: University of Saskatchewan, 1999.

Harp, H.F. *The Prairie Gardener*. Edmonton: M.G. Hurtig Ltd., 1970.

Hay, David. "Rural Population." In *The Encyclopedia of Saskatchewan: A Living Legacy*, 787-789. Regina: Canadian Plains Research Center, 2005.

International Institute for Sustainable Development. On the Great Plains. http://www.iisd.org/agri/default.htm

Martin, Chester. *"Dominion Lands" Policy*. Toronto: McClelland and Stewart Limited, 1973.

McCann, L.D., edit. *Heartland and Hinterland: A Geography of Canada*. Scarborough, ON: Prentice-Hall Canada Inc., 1987.

McLennan, David. *Our Towns: Saskatchewan Communities from Abbey to Zenon Park*. Regina: Canadian Plains Research Center, University of Regina, 2008.

Neufeld, David M. "Brooding Over the Next Generation of Prairie Farmers: Making Space for Our Practical Minded Youth." Manitoba: Canadian Centre for Policy Alternatives, 2008. http://www.policyalternatives.ca/publications/reports/brooding-over-next-generation-prairie-farmers

Radenbaugh, Todd A. and Douaud, Patrick C., edit. *Changing Prairie Landscapes*. Regina: Canadian Plains Research Center, University of Regina, 2000.

Rees, Ronald. *New and Naked Land: Making the Prairies Home*. Saskatoon, SK: Western Producer Prairie Books, 1988.

Stabler, Jack C, Olfert, M.R., and Fulton, Murray. *The Changing Role of Rural Communities in an Urbanizing World: Saskatchewan 1961-1990*. Regina: Canadian Plains Research Center, University of Regina, 1992.

Stabler, Jack C. and Olfert, M.R. *Restructuring Rural Saskatchewan: The Challenge of the 1990s*. Regina: Canadian Plains Research Center, University of Regina, 1992.

Stushnoff, Cecil and Jeannette. *Prairie Garden Notebook: A Record-Keeping Guide for Fruit and Vegetable Growing*. Saskatoon: Western Producer Prairie Books, 1988.

Vick, Roger. *Gardening on the Prairies: A Guide to Canadian Home Gardening*. Saskatoon: Western Producer Prairie Books, 1987.

Other Referenced Sources

Agriculture and Agri-food Canada. "About the Center" Published August 2008. http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1186152258980&lang=eng

Agriculture and Agri-food Canada. "Horticulture - Vegetables: A Growing Industry." Published October 2007. http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1193665504082&lang=eng

Bennet, Al. Personal conversation. May 2008.

Board of County Commissioners, Citrus County, Florida. "Citrus County Canning Center." Published online 2009. http://www.citruscountyfl.org/commserv/extension/canning/canning_center.htm

Canadian Farm Business Management Council. "Bridging The Gap: Turning a Good idea into an Actual Business." In *Canadian Farm Manager Newsletter*, June/July 2007 – Special Edition: Growing Ideas. Accessed online at http://www.farmcentre.com/News/CFMNewsletter/Article.aspx?newsletter=9027948a-7977-469a-8f5f-2f997ba3a53a&id=4ab5c3e1-91ce-4de6-a982-e5d8f51003f5

Center for Urban Agriculture at Fairview Gardens, The. "Who We Are: Introduction" Accessed November 2011. http://www.fairviewgardens.org/who_intro.html

City Park Community Garden. Accessed November 2011. http://cityparkcommunitygarden.blogspot.com/

Coleman, Eliot. *Winter-harvest Manual: Farming the Back Side of the Calendar*. Harborside, Maine: Four Season Farm, 1998.

Craik Sustainable Living Project. Accessed November 2011. http://www.craikecovillage.com/

EcoVillage at Ithaca. "History of EVI." Accessed November 2011. http://ecovillageithaca.org/evi/index.php?option=com_content&view=article&id=50&Itemid=56

Edible Schoolyard Berkeley. "Missions and Goals." Accessed November 2011. http://edibleschoolyard.org/berkeley/mission-goals

Ehman, Amy Jo, Home for Dinner. Blog entry circa 2008.

Fairview Gardens CSA. Accessed November 2011. http://fairviewgardenscsa.wordpress.com/

Friends of Dufferin Grove Park. "Farmers' Market." Accessed November 2011. http://dufferinpark.ca/market/wiki/wiki.php

Gardner, Alison. "Vancouver's Granville Island: From Industrial Sandbar to Vibrant Year-Round Destination." Published online at T*ravel with a Challenge: Countries and Culture, Cruises, and Nature Vacations for Mature Travelers*, Dec. 2010. http://www.travelwithachallenge.com/Vancouver-Granville-Island.htm.

Local Harvest. Accessed November 2011. http://www.localharvest.org/

Macey, Anne, editor. *Organic Livestock Handbook*. Ottawa: Mothersill Printing, Inc, 2000.

Manitoba Historical Society. "Time Links: Dominion Experimental Farms." Published online August 2009. http://www.mhs.mb.ca/docs/features/timelinks/reference/db0083.shtml

McQuail, Fran, and Tony. Personal conversation. March 10, 2008.

Morrigan, Jane. "Will Mobile Abattoirs Help Small-scale Livestock Farmers?" Published online at Organic Agriculture Centre of Canada, Newspaper Article Archives, Western Canada, Jan. 2005. http://www.agbio.ca/NewspaperArticles/na_mobile_abattoir_part1.asp

Morrigan, Jane. "Mobile Abattoirs: Benefits and Challenges" Western Canada: Published online at Organic Agriculture Centre of Canada, Newspaper Article Archives, Western Canada, Feb. 2005. http://oacc.info/NewspaperArticles/na_mobile_abattoir_part2.asp

Pine View Farms. Accessed November 2011. http://www.pineviewfarms.com/

Polyface Inc. "Our Story." Accessed November 2011. http://www.polyfacefarms.com/default.aspx

Renz, Katie. "Grains gone (almost) Wild." In *Terrain Magazine*, spring 2006. Accessed online at http://ecologycenter.org/terrain/issues/spring-2006/grains-gone-almost-wild/

Saskatoon Community Clinic. "Food Deserts in Saskatoon." Information bulletin for poverty awareness week: October, 2008. http://www.saskatooncommunityclinic.ca/pdf/CC%20Food%20desert%20sheet%20Oct%2014.pdf

Satzewich, Wally, and Roxanne Christensen. "SPIN® Farming #9: SPIN® Intermediate Farm Model." Published online at spinfarming.com, 2005. Referenced as 2005(b). http://www.spinfarming.com/buy/farming.php.

Saxinger, Josef. Personal conversation. May 2008.

Strafford Organic Creamery at RockBottom Farm. Accessed November 2011. http://www.straffordcreamery.com/

Toronto Community Garden Network. "Community Gardens in Toronto and the GTA." Accessed November 2011. http://www.tcgn.ca/wiki/wiki.php?n=TorontoGardens.FrontPage

USC Canada. "Honduran Farmers Produce Higher Quality Seeds – Locally." Published online at USC Canada, April 17, 2007. http://usc-canada.org/2007/04/17/a-focus-on-local/

Vicki's Veggies. Accessed November 2011. http://www.vickisveggies.com/Home.html

Wild Fire Organic Bakery & Café. "About Wild Fire." Accessed November 2011. http://www.wildfirebakery.ca/home.html

Zdybel, Katie. "Journey of a Seed: Baking with Red Fife Wheat at Victoria's Wildfire Bakery." In *Eat Magazine: Featuring the food and drink of British Columbia*, Dec. 22, 2008. Accessed online at http://www.eatmagazine.ca/article/2008-12-22/red_fife_wildfire_bakery

Additional References Regarding Production Models Specifically

Small-plot Intensive Vegetable Production

Satzewich, Wally. Market Gardening Concepts. Online bulletin, started in 1998. http://www.marketgardening.com/

Wally's Urban Market Garden.
http://www.marketgardening.com/wallysmarketgarden/

Satzewich, Wally, and Roxanne Christensen. "SPIN® Farming #4: Putting SPIN® Farming into Practice." Published online at www.spinfarming.com, 2005. Referenced as 2005(a). http://www.spinfarming.com/buy/farming.php.

SPIN® Farming.
http://www.spinfarming.com/

Protected Intensive Vegetable Production

Ableman 2005, 172-180.

Four Season Farm.
http://www.fourseasonfarm.com/

Coleman, Eliot. *Four-Season Harvest: Organic Vegetables from your Home Garden all Year Long*. Vermont: Chelsea Green Publishing Company, 1999.

Holistic Orchard Network.
http://www.groworganicapples.com/organic-apple/

Meeting Place Organic Farm.
http://www.meetingplaceorganicfarm.ca/

Phillips, Michael. *The Apple Grower: A Guide for the Organic Orchardist*. White River Junction, Vermont: Chelsea Green Publishing Company, 2005.

Lost Nation Orchard.
http://www.herbsandapples.com/orchard/

St-Pierre, Richard. "The Culture of Some Common Prairie Native Fruit Species." Originally published in Bulletin of the Heritage Seed Program 5(2): 12-19, 1992. Published online at http://www.prairie-elements.ca/heritage1.html.

St-Pierre, Richard. "Biology, Culture and Conservation of Canadian Native Plant Species." Series of articles published online at www.prairie-elements.ca. http://www.prairie-elements.ca/nativeplants.html

University of Saskatchewan Fruit Program.
http://www.fruit.usask.ca/

Small-scale Diverse Grains and Cereals Production

Ableman 2005, 42-49.

Ilda, Jennifer, producer. "Heirloom Grains." For *America's Heartland*, season 3. American Public Television. KVIE, Sacramento. Available online at http://www.americasheartland.org/episodes/episode_319/heirloom_grains.html#

Logsdon, Gene. *Small-scale Grain Raising*. Emmaus, Pennsylvania: Rodale Press, Inc., 1977.

Sourdough Monkey Wrangler blog. "Windborne Grains." Article posted Tuesday February 12, 2008. http://sourdoughmonkeywrangler.blogspot.com/2008/02/windborne-grains.html

Closed-loop Dairy Production

Ableman 2005, 164-171.

RockBottom Farm blog. http://rockbottomfarm.blogspot.com/

Huyffer, Amy. E-mail correspondence with author, November 14 & 15, 2008.

Macey, Anne. *Organic Livestock Handbook: A Project of Canadian Organic Growers Inc*. Ottawa: Canadian Organic Growers Inc., 2000.

Natural-systems Mixed Livestock Production

Ableman 2005, 210-218.

Pollan 2006, 185-261.

Salatin, Joel. *$alad Bar Beef*. Swoope, Virginia: Polyface Inc., 1995.

Salatin, Joel. *You Can Farm: The Entrepreneur's Guide to Start and $ucceed in a Farming Enterprise*. Swoope, Virginia: Polyface Inc., 1998.

Callenbach, Ernest. *Bring Back the Buffalo!: A Sustainable Future for America's Great Plains.* Berkeley: University of California Press, 2000.

Appendices

Appendix One:

Fruit and Vegetable Availability in Southern Saskatchewan 217

1.1 Annual Fruits and Vegetables 218
1.2 Perennial Fruits and Vegetables 224

Appendix Two:

Three Farm Models, an Elaboration 229

2.1 Small-Plot Intensive (SPIN®) Vegetable Production 231
2.2 Protected Intensive Vegetable Production 236
2.3 Integrated Holistic Fruit and Animal Production 244

Appendix Three:

Farm Model Yield Calculations 247

3.1 Small-Plot Intensive (SPIN®) Vegetable Production 248
3.2 Protected Intensive Vegetable Production 252
3.3 Integrated Holistic Fruit and Animal Production 256

(continued on following page)

Appendix Four:

Additional Information Regarding the Rural S-E Sector 259

4.1 Town Population Figures 260
4.2 Existing Rural Communities 261
4.3 Existing Initiatives Promoting Small-scale Sustainable Agriculture 268
4.4 Enlargement and Legend of Craik's "Green Map". 270

Appendix Five:

Urban Node-Making Elements, a Detailed Description 271

5.1 Public Parks 274
5.2 Social Community Infrastructure 276
5.3 Commercial Areas 278
5.4 Residential Areas 280

Appendix One

Fruit and Vegetable Availability in Southern Saskatchewan

With a hardiness-zone rating that stretches from 3a in the south to 2a in the north*, and a frost-free growing season of only 120 days,** some may question the viability of an "eat local" proposal in southern Saskatchewan as a result of the limitations of climate. While it is true that not every type of fruit and vegetable that can be grown in southern Ontario can be grown on the Prairies, there is still a very significant number that can be.

The following section illustrates this with two lists. First, *annual* fruits and vegetables; and second, *perennial* fruits and vegetables, all of which (with little to no protection) have been or are currently being grown by home gardeners, seed distributors, commercial farmers or university researchers, with a significant amount of success in southern Saskatchewan.

---

* Agriculture and Agri-food Canada. "Plant Hardiness Zones in Canada." http://sis.agr.gc.ca/cansis/nsdb/climate/hardiness/intro.html
** Victory Seeds. "Average Canadian First and Last Frost Dates." http://www.victoryseeds.com/frost/canada.html

Annual Fruits and Vegetables

With a nearly 40-day shorter growing season than southern Ontario, some restrictions do exist on the type and variety of fruits and vegetables that can be grown in Southern Saskatchewan. While fast-growing, cool-weather vegetables such lettuce, green onions, broccoli, spinach, carrots, radishes, peas and beans are perhaps best suited to the climate, care must be taken when planting warm weather longer-ripening fruits and vegetables such as eggplant, melons and sweet corn in order to chose both the earliest as well as hardiest varieties in order to be assured of a reasonable harvest.

Besides noting 39 annual fruits and vegetables that can be grown with success on the Prairies, the following includes a list of named cultivars (cultivated varieties) that have been recommended for the Prairie climate . Those names in bold have been recommended specifically by the University of Saskatchewan Vegetable Program. (See "list of sources" following this section for a complete list of references.)



Aubergine (Eggplant)
Solanum melongena

avail./**recommend.** cultivars:

Aubergine, Black Bell, **Casper**, **Dusky**, **Ghost Buster**, Morden Magic



Beets
Beta vulgaris

avail./**recommend.** cultivars:

Albina Vereduna, Bull's Blood, Burpee Golden, Crapaudine, Detroit Dark Red, **Detroit Supreme**, Early Wonder, **Formanova**, Green Top Bunching, Mammoth Long Red Mangel, **Pablo**, **Rosette**, Ruby Queen



Broad Beans
Vicia faba

avail./**recommend.** cultivars:

Aprovecho Select, **Aquadulce**, Broad Windsor, Bunyards Exhibition, Con Amore, Green Windsor, Jubilee Hysor, Masterpiece Green Longpod, Polar, The Sutton, Threefold White, **Witkiem**, (etc)



Broccoli
Brassica oleracea Italica

avail./**recommend.** cultivars:

Arcadia, Calabrese, **Captain, Coronado, Crown**, **Emerald Crown, Eureka, Everest, Goliath,** Green Comet, **Green Magic, Ironman, Major, Marathon, Patriot, Patron**, Premium Crop, Purple Peacock



Brussels Sprouts
Brassica oleracea Gemmifera

avail./**recommend.** cultivars:

Adagia, Jade Cross F1, Long Island Improved, **Oliver, Sprouket**



Cabbage
Brassica oleracea Capitata

avail./**recommend.** cultivars:

early season:

April Green, **Balbro,** Derby Day, **Dynamo,** Early Jersey Wakefield, Early Marvel, **Grenadier, Stokes Early**

mid season:

Almanac, Bravo, Corsar, Minicole, Stonehead, Ranger, **Vantage Point**

late season/storage:

Bartolo, **Rio Verde**, Storage Green, Survivor, **Transam**

red: **Azuro, Buscaro, Red Jewel, Roxanne, Royal,** Mammoth Red Rock,



Carrots

Daucus carota subsp. *sativus*

avail./**recommend.** cultivars:

Nantes style:

Coreless Amsterdam, **Forto Selection,** Little Finger, **Napoli, Navarino,** Scarlet Nantes, Touchon Deluxe, **YaYa**

Danvers style:

Achieve, Big Sur, Cordoba, Danvers Half Long, Royal Chantenay, Spartan Bonus

Imperator style:

Dragon Purple, **Apache, Bremen, Eagle,** Imperator

Undetermined:

Oxheart, Phalzer



Cauliflower

Brassica oleracea Botrytis

avail./**recommend.** cultivars:

Minuteman, **Shasta**, **Serrano**, Snowblanche, Snowball, White Fox



Celery

Apium graveolens var. dulce

avail./**recommend.** cultivars:

Golden Self-blanching, Improved Utah, **Tango**, Tendercrisp, **Ventura**



Chinese Cabbage

Brassica rapa v. pekinensis

avail./**recommend.** cultivars:

Banko, Chi-Hi-Li, Michilli, **Monument, Nerva, Optiko, Pak Choi,** Spring Time,



Cucumbers

Cucumis sativus

avail./**recommend**. cultivars:

slicing type:

Burpless Hybrid, **Fanfare,** Green Ridge, **Markemore 76,** Spacemaster, **Speedway,** Straight Eight, **Straight 9**, Sweet Slice Hybrid, Tante Alice

white/yellow type:

Boothby's Blond, Landis White, Lemon, Miniature White, White Wonder

pickling type:

Atomic, Ballerina, Bush Crop, Bush Pickle, **Cool Breeze,** Earli Pik, Early Russian, **Eclipse, Eureka, Europick, Fancipick,** Morden Early, **Northern Dawn,** Northern Pickling, Pioneer, Spartan Dawn Hybrid



Endive

Cichorium endivia

avail./**recommend.** cultivars:

Green Curled, Batavian



Garlic

Allium sativum

avail./**recommend.** cultivars:

stiffneck type:

Czech, M&M Stiffneck, Music

softneck type:

Fishlake FL-4, Vessey's



Green (Snap) Beans

Phaseolus vulgaris/coccineus

avail./**recommend.** cultivars:

bush type:

Admires, Black Valentine, Blue Bloom, Blue Lake, Contender, E-Z Pick, Florence, **Foremost**, Jumbo, **Montano**, Mr Fear's, **Nash, Provider**, Purple Teepee Purple Queen, Red Swan,

Remus, **Royal Burgundy,** Royalty, **Stayton, Strike,** Tendercrop, Venture

filet type:

Argus, Aramis, **Belna,** Delinel, Deuil Fin Precoce, Fin de Bagnols, **Masai,** Tavera, Triumph de Farcy

wax type:

Brittle Wax, Cherokee Wax, Dragon Tongue, **Eureka, Fruidor,** Gold Crop, **Gold Mine**, Indy Gold, Keygold, Major, Pencil Pod Black Wax, Rocdor, Sungold

pole type:

Aunt Jean's Bean, Blue Lake Stringless, Cascade Giant, Gold Marie, Grandma Nellie's, Kentucky Wonder, McCormick's Wonder, Northeaster, Odawa Soup, Purple Pole Bean, Rattlesnake, True Red Cranberry

runner type:

Painted Lady, Scarlet Emporer, White Half Runner



Green Onions
Allium fistulosum

avail./**recommend.** cultivars:

Evergreen White Bunching, **Ishikura Improved**, Japanese Bunching, **Kincho**



Kale
Brassica oleracea Acephala

avail./**recommend.** cultivars:

Dwarf Green Curled, Green Curled Scotch, Lacinato Rainbow, Red Russian, **Squire**, **Winter Bor**



Kohlrabi
Brassica oleracea Gongylodes

avail/recommend. cultivars:

Early Purple/White Vienna, **Kongo**, **Rapidstar**



Leek
Allium ampeloprasum

avail./**recommend.** cultivars:

Albinstar, American Flag, Autumn Giant, **Giant Musselburg**, Titan, Unique



Lettuce
Lactuca sativa

avail./**recommend.** cultivars:

Butterhead type:

Bennett, Boston, Buttercrunch, **Esmeralda, Harmony, Mantilla,** Mescher, Pirat, **Pybas Red Butter**, Tom Thumb

Crisphead type:

Ice Queen, Ithaca, **Great Lakes, Tiber**

Romaine type:

Clarimonte, Devil's Tongue, Forellenschluss, Outredgeous, **Green Forest, Parris Island Cos,** Plato, **Remington**

Looseleaf type:

Black Seeded Simpson, **Brigade, Franklin**, Grand Rapids, **Marin, Pacifica,** Prizehead, Red Deer Tongue, **Salad Bowl,** Oak Leaf



Mesclun Greens
various

ravail./**recommend.** species/varieties/cultivars:

Arugula, Mustard greens, Swiss Chard (see entry), Spinach (see entry), Mizuna, Mache, Endive (see entry), Dandelion, Frisee, Sorrel, Radicchio



Muskmelon
Cucumis melo

avail./**recommend.** cultivars:

Cantaloupe type:

Alaska, Altai, **Athena,** Boughem, Far North, **Fastbreak, Earliqueen,** Early Black Rock, Maine Rock, Northern Gold, Northern Queen, **Pulsar**

Honeydew type:

Passport, Superstar



Onions
Allium cepa

avail./**recommend.** cultivars:

Spanish type:

Kelsae Giant, Riverside Sweet Spanish, Teton Hybrid, Yellow/White Sweet Spanish

yellow type:

Copra, Daytona, Early Yellow Globe, Eskimo, **Frontier, Nebula,** Norstar, Rocket, Taurus,

red type:

Autumn Spice, **Grateful Red,** Large Red Wethers, Red Baron, **Mars, Red Bull F1, Red Burgermaster**

pickling type:

Silver Queen, White Barletta, White Pearl



Parsnips
Pastinaca sativa

avail./**recommend.** cultivars:

All American, **Andover Germplus, Harris Model, Hollow Crown, Javelin,** Kral, Model, Short Thick



Peas
Pisum sativum

avail./**recommend.** cultivars:

Bolero, Early Onward, **Eclipse, Galina,** Green Arrow, Homesteader, Jade, Knight, Large Manitoba, Lincoln, Little Marvel, Maestro, Northern Sweet, Novella, **Novella Improved,** Olympia, Prairie Parsley, **Straight Arrow,** Tom Thumb, Triple Treat



Peppers
Capsicum annuum

avail./**recommend.** cultivars:

bell type:

Ace, Apple, Belgian Red, Castle, Early Canada Bell, Golden Bell, Gypsy, Hungarian Yellow, Red Cherry, **Red Start, Scarlet King, Socrates X3R, Wizard X3R,** Yankee Bell

banana type:

Banana Supreme

hot type:

Cayenne Long Slim, **Cherry Bomb, Golden Cayenne,** Hot Hungarian Wax, **Mucho Nacho,** Red Cherry, **Super Jumbo Jalapeno**



Potatoes
Solanum tuberosum

avail./**recommend.** cultivars:

yellow type:

Bintje, Yukon Gold, Goldrush

red type:

Norland, Red Pontiac, Viking, AC Perigrine Red, Sangre

russet type:

Russet Burbank, Lemhi Russet, Norgold Russet

white type:

Carlton, Kennebec, AC Ptarmigan, Caribe



Pumpkins
Cucurbita maxima/pepo

avail./**recommend.** cultivars:

Autumn King, Baby Bear, Big Autumn, Cheyenne Bush, Jack-O-Lantern, **Orange Smoothie, Neon, Rouge Vif D'etampes,** Spirit, **Spirit Hybrid,** Sugar Pumpkin, Young's Beauty



Radishes
Raphanus sativus

avail./**recommend.** cultivars:

Black Spanish, Champion, Cherry Belle, China Rose, **Fireball,** French Breakfast,

Miyashige Daikon, **Poker,** Rat's Tail Raddish, **Rebel,** Sparkler, Tricolour, White Chinese, White Icicle, White Prince



Rutabagas
Brassica napobrassica

avail./**recommend.** cultivars:

Altasweet, Joan, **Laurentian varieties**



Salsify
Tragopogon porrifolius

avail./**recommend.** cultivars:

Mammoth Sandwich Island



Snap/Sugar Peas
Pisum sativum v. macrocarpon

avail./**recommend.** cultivars:

snap type:

Cascadia, June's Delight, Rae, **Sugar Ann,** Sugar Bon, Sugar Mel, Sugar Snap, Sweet Jade

sugar/snow type:

Chinese Giant Snowpea, Golden Sweet, Oregaon Giant, **Oregon Sugar Pod,** Norli, Snow Wind, Russian Sugar Pea



Spinach
Spinacia oleracea

avail./**recommend.** cultivars:

America, Bloomsdale, King of Denmark, Long Standing, **Skookum, Tyee,** Vienna, **Whale**



Summer Squashes
Cucurbita maxima/pepo

avail./**recommend.** cultivars:

green zucchini:

Ambassador, Black Zucchini, **Bobcat, Cashflow**, Costata Romanesco, **Spineless Beauty, Super Gray,** Zucchini Select

yellow zucchini:

Early Yellow Crookneck, **Gold Finger,** Gold Neck, **Golden Rod**

other types:

Round Zucchini, White Bush Scallop



Sweet Corn
Zea mays v. rugosa

avail./**recommend.** cultivars:

standard:

Buttervee, Classic Touch, Dorinny, Earliking, **Earlivee**, Early Golden Bantam, Golden Beauty, Luther Hill, Northlite, Orchard Baby, **Seneca Horizon**, Polarvee, Simonet, Spartan, Sunny Vee,

sugar enhanced:

Cochise, Edelweiss, Envoy, Frisky, Geronimo, Grant, Maple Sweet, **Seneca Tomahawk,** Spring White, Sugar Bun, **Sunray, Sweet Rhythm**

super sweet:

Confection, Candy Corner, Fantastic, Mirai 421, Northern Xtra Sweet, Northern Super Sweet, Sweetie, **Optimum,**



Swiss Chard
Beta vulgaris v. cicla

avail./**recommend.** cultivars:

Bright Lights, Burgundy, Five Color Siverbeet, Fordhook Giant, Lucullus, **Pink 14648**, Rhubarb Chard, **Silver Giant**



Tomatoes
Solanum lycopersicum

avail./**recommend.** cultivars:

early, determinate:

Alpha, Atom, Cheerio, Coldset, **Duchess**, Fir Tree, Glacier, Kimberley, Polar Rocker, Rocket, Russian, Russian Sask, Siberian, Stokes Alaska, Sub-Arctic Maxi, Sub-Arctic Plenty, Whipper Snapper

main crop, determinate:

Blazer, Bounty, Brookpact, **Cabot**, Canada Northstar, **Celebrity,** Earlibright, Earlirouge, Early Chatam, Early Lethbridge VR, Early Rutgers, Fantastic, Harrow, Manitoba, Moira, Rideau, Scotia, Starfire, **Sunrise, Super Fantastic**, Swift, Victor, Vineland Bright, (etc.)

indeterminate:

Adda, Black Krim, Black Plum, **Black Prince**, Black Russian, Brandywine Red, Break O' Day, Bonny Best, Globonnie, Grightmine's Pride, Merveille Des Marches, **Orange King, Oxheart**, Redskin, Ultra Girl, Ultra Boy, Valentine

cherry/currant, indeterminate:

Gardener's Delight, Ghost Cherry, Red Currant, Rideau Sweet, Sungella, Tigerella, Yellow Currant, Yellow Pear

yellow/orange/bi-coloured:

Blanche du Quebec, Gold Rush, Elberta Girl, Fargo Yellow Pear, Ida Gold, Isis Candy Cherry, Morden Yellow, Little Yellow Pot Tomato, Striped Cavern, **Taxi**

paste:

Bellestar, Marmande, **Monix**, Nova, Quebec #1121, Quebec #2473



Turnips

Brassica rapa v. rapa

avail./**recommend.** cultivars:

Early Snowball, **Purple Top White Globe**, Scarlet Ohno, Tokyo Cross, Yellow Globe



Watermelons

Citrullus vulgaris

avail./**recommend.** cultivars:

red flesh:

Bozeman Melon, Early Canada, **Lantha, Redlicious,** Stokes Sugar Hybrid, Sugar Baby, **Sweet Black, Sweet Favorite**

yellow/white flesh:

Cream of Saskatchewan, **Tiny Orchid, Yellow Baby**



Winter Squashes

Cucurbita maxima/pepo

avail./**recommend.** cultivars:

Acorn type:

Acorn, **Cream of the Crop,** Gold Nugget, **Table Ace,** Table Queen

Buttercup type: **Ambercup, Buttercup,** Black Forest

Butternut type: **Early Butternut, Ultra Butternut**

Delicata type: **Sugarloaf**

Hubbard type: Blue Ballet, Golden Delicious

Spaghetti type:

Small Wonder, Stripetti, Vegetable Spaghetti

1.2 Perennial Fruits and Vegetables

The most significant restriction on perennial fruit and vegetable production on the Prairies is the harshness of the winter. While this makes it difficult to grow many common fruits, the following list contains 22 perennial fruits (1 vegetable) that can still be grown on the Prairies.

While two of these (apricots and pears), are considered marginally hardy in zones of 3a and above, the majority of the fruits listed are hardy up to and including to zone 2b. Although this may seem like a fairly limited list, it is worth noting that this list is not static.

Working with an extensive list of native fruit-bearing species (e.g. gooseberries, chokecherries, Saskatoons, currants, lingonberries, blueberries, highbush cranberries) as well as cold-hardy exotic species from all over the world, plant breeders at the University of Saskatchewan and elsewhere are adding new cultivars to this list every few years. Blue haskap, and dwarf sour cherries for instance have went from being nonexistent to commonly cultivated, viable commercial endeavours in less than 10 years.



Apples
Malus x. domestica

potential/**popular** cultivars:

early season:

Adanac, Norland, Westland, **Prairie Sun,** Sunnybrook

mid-season:

Alberta Buff, A. Red, A. Gold, Brookland, **Battleford,** Boughen Delight, **Carlos Queen, Fall Red, Goodland,** Harcourt, **Misty Rose,** Norda, **Norkent,** Parkland, Patterson, **Prairie Sensation, September Ruby, Westland**

late season:

Alberta Green, Autumn Delight, Fall Red, Festive Treat, Goodland, **Haralson**, Honeycrisp, **Minnesota #447**



Apricots
Prunus armeniaca

potential/**popular** cultivars:

Brookcot, Morden 604, Prairie Gold, Scout, Westcot



Asparagus
Asparagus officinalis

recommended cultivars:

Mary Washington, Viking



Blueberries
Vaccinium spp.

available wild species:

Low-bush Blueberries (*Vaccinium myrtilloides)*

potential/**popular** cultivars:

Chignecto, Chippewa, Cumberland, North Country, North Sky, Northblue, Northland, Patriot



Blue Haskap
Lonicera caerulea edulis

potential/**popular** cultivars:

9-91, 9-92, 9-15, Cinderella, Berry Blue, Blue Bell, **Borealis**, Svetlana, **Tundra**



Buffaloberries
Shepherdia spp.

available wild species:

Silver Buffaloberry *(Shepherdia argentea)*, Canada Buffaloberry *(Shepherdia canadensis)*



Bush Cranberries
Viburnum spp.

available wild species:

High-bush Cranberry (*Viburnum trilobum)*, Low-bush Cranberry (*Viburnum edule*)

potential/**popular** cultivars (high-bush type):

Alaska, Wentworth



Cherry plums
Prunus spp.

potential/**popular** cultivars:

red-fleshed:

Dura, **Kappa**, **Manor**, Mistawasis, **New Oka**, **Sapa**, Sapalta, **Zeta**

green-fleshed:

Alace, **Beta,** Heaver, **Opata**, Prolific, Skinner's Favorite

yellow-fleshed:

Convoy



Chokecherries
Prunus virginiana

available wild species:

Western Chokcherry, Black Chokecherry, Red Chokecherry

potential/**popular** cultivars:

Canada Red, **Garrington**, Midnight Shubert, **Pickup's Pride**, Robert, **Shubert**



Crabapples/Applecrabs
Malus x. domestica

potential/**popular** cultivars:

Crabapples:

Arctic Red, **Dolgo**, Columbia, Dandy, **Kerr**, Norther, Osman, Rosy Brook, Thunderchild

Applecrabs:

Goodman, Heyer-12, **Rescue,** Rosy Brook, Sunnybrook, Trailman



Currants
Ribes spp.

available wild species:

Northern Red Currant (*Ribes triste*), Northern Black Currant (*Ribes hudsonianum*)

potential/**popular** cultivars:

red currants:

Honey Red, Perfection, **Red Lake**, Stephens

black currants:

'Ben' series, Black Albol, Black Giant, Boskopp Giant, Buddenborg, Consort, Magnus, Willoughby

white currants:

White Imperial, White Lake



Gooseberries
Ribes spp.

available wild species:

Northern Gooseberry (*Ribes oxyacanthoides*)

potential/**popular** cultivars:

Hinnonmaeki Red, **Jahn's Prairie**, Pankiw, Pembina Pride, **Pixwell**, Thoreson, **Welcome**



Grapes
Vitis spp.

available wild species:

Riverbank Grape (*Vitis riparia*)

potential/**popular** cultivars:

Alpha, **Beta**, Bluejay, Dakota, Frontenac, Hungarian, Kay Gray, Minnesota #78, Moonbeam, St. Croix, Svelter, **Valiant**



Lingonberries
Vaccinum vitis-idaea

available wild species:

North American Lingonberry (*Vaccinum vitis-idaea v. minus*)



Pears
Pyrus spp.

potential/**popular** cultivars:

Andrew, David, Early Gold, Fedorovsk, Golden Spice, **John**, Olia, Peter, Philip, Prairie Sweet, Roppo, Summer Crisp, **Thomas**, Tioma, **Ure**



Pin Cherries
Prunus pensylvanica

available wild species:

Wild Pin Cherry (*Prunus pensylvanica)*

potential/**popular** cultivars:

Jumping Pound, Mary Liss, Mr. Lee, Stockton Double



Plums
Prunus spp.

available wild species:

Canada Plum (*Prunus nigra*)

potential/**popular** cultivars:

Acme, Assinboine, Bounty, **Brookgold, Brookred**, Dandy, Elite, **Fofonoff, Green Elf**, Ivanovka, Norther, **Patterson Prairie**, **Pembina, Perfection,** Pipestone, **Prairie**, **Ptitsin #3, Ptitsin #5**, Superior



Raspberries
Rubus spp.

available wild species:

Wild Raspberry (*Rubus idaeus)*

potential/**popular** cultivars:

red: Chief, **Boyne**, Heritage, **Festival, K81-6,** Killarny, Latham, Nova, Red River, SK Red Bounty, **SK Red Mammoth**, Souris, **Steadfast**

purple: **Royalty**

black: Doyle Thornless, Wyoming Black

yellow: **Honeyqueen**, Fall Gold

Primocanes:

Autumn Bliss, Red River, Double Delight



Rhubarb
Rheum rhabarbarum

recommended cultivars:

Canada Red, Cherry Wine, Crimson Red Cherry, Early Sunrise, German Wine, Honey Red, McDonald, Ruby, Valentine, Victoria



Saskatoons
Amelanchier alnifolia

available wild species:

Wild Saskatoon (*Amelanchier alnifolia)*

potential/**popular** cultivars:

Altaglow, Buffalo, Bluff, Elizabeth, Forestburg, Honeywood, JB30, Killarney, Lee #3, Martin, Moonlake, Nelson, Northline, Paleface, Parkhill, Pearson II, Pembina, Regent, Smoky, Sturgeon, Thiessen



Sea Buckthorn
Hippophae rhamnoides

potential/**popular** cultivars:

Botanica, Frugana, **Harvest Moon,** Hergo, Indian Summer, Leikora Dual, Russian Orange, Siberian Splendor, Star of Alti, Sunny, Titan



Sour Cherries
Prunus spp.

potential/**popular** cultivars:

Nanking type:

Black Nanking, Red Nanking, White Nanking

Evans type:

Evan's Cherry

Dwarf Sour type:

Crimson Passion, Cupid, Juliet, Romeo, SK Carmine Jewel, **Valentine**

Mongolian type:

Mongolian Cherry

Sandcherry type:

Western Sandcherry



Strawberries

Fragaria x. ananassa

potential/**popular** cultivars:

june bearing:

Annapolis, Bounty, Cavendish, Honeoye, **Kent,** Protem, Redcoat, Senga Sengana

day neutrals:

Aptos, **Fern**, Hecker, **Seascape, Tristar**

ever bearing:

Fort Laramie, Jubilee, **Ogallala**

Appendix One List of Sources

Harp, 1970.

Saskatchewan Fruit Growers Association. "Fruit Crops." Accessed September 16, 2011. http://www.saskfruit.com/modules.php?name=Sections&sop=viewarticle&artid=16

St. Pierre, 1992.

Stushnoff, 1988.

Ternier, Jim. "2011 Prairie Garden Seeds Catalogue." Accessed September 16, 2011. http://www.prseeds.ca/catalogue/

Urban Farmer, The. "Edible Plants for the Prairies." Accessed September 16, 2011. http://theurbanfarmer.ca/resources/edible-plants-for-the-prairies/

University of Saskatchewan Extension Division. "Gardenline: Vegetables." Accessed September 16, 2011. http://gardenline.usask.ca/veg/index.html

University of Saskatchewan Extension Division. "Gardenline: Fruit to Grow and Pick." Accessed September 16, 2011. http://gardenline.usask.ca/fruit/index.html

University of Saskatchewan Fruit Program. "Crops." Accessed September 16, 2011. http://www.fruit.usask.ca/

University of Saskatchewan Vegetable Program. "Recommended Varieties for Saskatchewan Producers." Accessed September 16, 2011. http://www.usask.ca/agriculture/plantsci/vegetable/vegetable/vrecommendvar.htm

Appendix Two Three Farm Models, an Elaboration

While the majority of production systems used as "models" were able to be sufficiently explained in Sections 2.1 and 4.2 combined, several have required a bit more information.

In the case of both "Small-plot Intensive Vegetable Production", and "Protected Intensive Vegetable Production" a more elaborate explanation was needed/desired in order to understand just *how much* yield was possible, and what exactly the *methods were* for arriving at such yields in order to make some kind of judgement as to how this could be translated to the Saskatchewan context. In the case of "Holistic Fruit Production", since no appropriate model was found to be translated to the Saskatchewan context, one had to be developed. All three model elaborations are included within this section.

System Diagram Legend:

type of food produced


cool-weather vegetables


temperate fruit


red meat


root vegetables


sugar and syrup


poultry


warm-weather vegetables


grains and cereals


eggs


annual fruit


pulses


dairy

type of marketing used


farmers' market


CSA program


on-farm store



local grocery


local restaurant


metropolitan food buying club

size of investment required

XS - extra small

S - small

M - medium

L - large

XL - extra large

net income earned

$ $0 - 24, 999/yr

$$ $25,000 - 49, 999/yr

$$$ $50,000 - 99, 999/yr

$$$$ $100,000 +/yr

capacity of operatiors


full-time


part-time



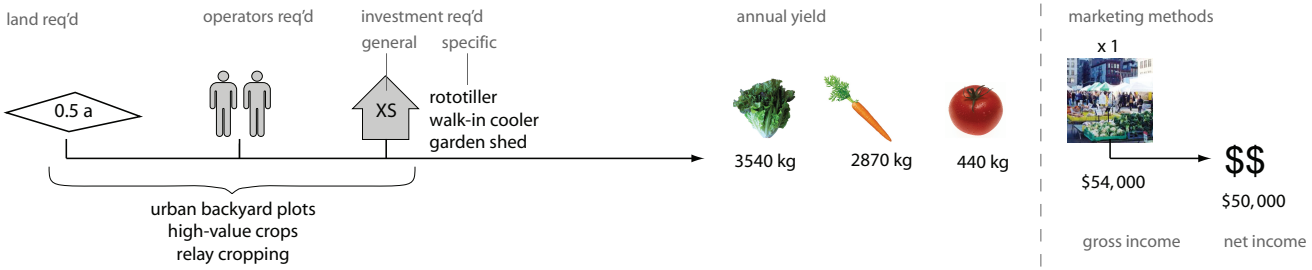
2.1 Small-Plot Intensive (SPIN®) Vegetable Production

Model Farm

Wally's Urban Market Garden, Saskatoon, Saskatchewan.

Wally Satzewich and partner Gail Vandersteen have developed a system of sub-acre urban farming that can yield over 7,000 kg of fresh vegetables from only half an acre of land, even within the short growing season of Saskatoon. Called "SPIN"® (Small Plot IN-tensive) farming, their system champions the use of multiple small urban backyard plots (up to 20 at any given time), crop rotation, manual labour and companion planting in order to minimize necessary inputs; while relay plantings of fast-growing, high-value crops together with an innovative marketing strategy maximizes outputs and returns. Sold direct to consumers at the Saskatoon Farmers' Market from early June to mid September, the Satzewich's estimate a gross income of $54,000/yr, while very few operating costs and expenses can leave up to $50,000 of that as income. (Satzewich and Christensen 2005(b), 4).

System Diagram



Urban Backyard Plots

Urban backyard plots are the foundation of the Satzewich system. Not only are they available for minimal rent - potentially less than $1000/season for 1/2 an acre (Satzewich and Christensen 2005(b), 5), but the microclimate of the city provides "a more controlled environment, fewer pests, better wind protection and a longer growing season" (Satzewich and Christensen 2005(a), 13), than a typical rural plot in a climate such as Saskatchewan's – resulting in a superior crop which is available slightly earlier as well as slightly later than that grown on an exposed rural plot.



FIGURE 22.1 - A Typical Plot of Wally's Market Garden, Spring 2008.

High-value crops

In their printed literature, SPIN's® creators state that "a common mistake of novice sub-acre farmers is to grow too many low-value crops, thereby depressing earnings from their land base." (Satzewich and Christensen 2005(a), 5) To avoid this, the Satzewiches have utilized standard size beds (2'x25') in order to identify "high" and "low-value" crops in their area. Any crop that can generate $100 or more per bed per harvest is considered "high-value", while anything less than that "low-value."

And while it is not possible, nor desirable, in all cases to eliminate low-value crops from one's repertoire entirely (they help provide a good diversity of crops at market stand, allow for more robust system of crop rotation, and generally take less labour than high-value crops), SPIN® suggests that they be used sparingly, in order to dedicate as much land as possible to higher value crops in order that returns are maximized.

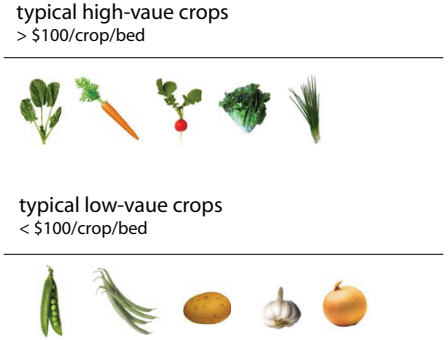


FIGURE 22.2 - Typical "High-value" and "Low-value" Crops of a SPIN® Farm.

Varying crop intensities

Because some plants do not take a full growing season to mature, another strategy used to maximize returns from the limited acreage of a SPIN® farm is relay planting. If crops are chosen wisely, and no time is wasted between the harvesting one crop and re-planting the next, it is possible to grow two or even three crops from the same plot of land in a single growing season, even in cold climates such as Saskatoon. Referred to as "crop intensities" SPIN® has identified relay plantings that produce 3, 2, and 1 crops/season as "intensive relay", "bi-relay" and "single crop" areas respectively. See Figure 22.3.

crop intensity	no. of crops	kind of crops	Saskatchewan example
intensive relay	3 or more	fast-growing, high-value ie. lettuce, scallion, radish, carrot, spinach, other leafy greens	Apr. 20 - June 7 > June 8 - late July > Aug.1 - Sept.10
bi- relay	2	low and high-value ie. peas, green beans, early pototoes, scallion, radish, carrot	May 21 - late July > Aug. 1 - early Sept.
single-crop	1	low-value ie. potatoes, onion, shallots, tomatoes, cucumbers, squash	May 11 - early Sept.

FIGURE 22.3 - The Varying Crop Intensities of a SPIN® farm.

And although the most revenue can be generated by exclusively growing crops in "intensive relay," it is also the most labour intensive and the most limited in terms of crop diversity. So, like high and low value crops, SPIN® advocates that a balance of crop intensities is required in order to develop a system that is both economically viable and physically manageable. For the half-acre farmer (for example), the Satzewich's suggest that this balance is thirds. See following.

The Half-acre Model

Based on their experience in the Saskatchewan climate, Wally and Gail Satzewich have developed several farm models utilizing their SPIN® strategy: the 1/8 acre "Hobby Farm", the 1/2 acre "Intermediate Farm", and the full acre "Deluxe Farm". Because of its close resemblance to the system practiced by the Satzewich's themselves, the 1/2 acre model has been used to estimate the yields of such a system, as well as act as the source farm for "Small-plot Intensive Vegetable Production" in the thesis.

As Figure 22.4 illustrates, twenty reasonably sized urban plots can easily provide a 1/2 acre land base, and in areas where plots larger than 2,000 sq. ft. are available - even fewer plots are required. Divided into thirds, five of the farm's most accessible plots have been devoted to growing high-value crops in intensive relay, while the least accessible third planted to low-value crops in single relay, leaving the remaining eight plots to be planted to a variety of both high and low-value crops in bi-relay.

In a climate such as Saskatchewan's, this has resulted in a crop repertoire of mostly cool-weather and small root vegetables - such as leafy greens, radish, carrot, scallion, lettuce, spinach and green garlic. Complimenting these crops, long-season root crops such as potatoes, onion, garlic, as well as warm-weather vegetables such as tomatoes, cucumbers and summer squash provide diversity both in the crop rotation and in customer selection at the market stand. (See Appendix Three for elaboration on specific crop rotations as well as yield calculations.)

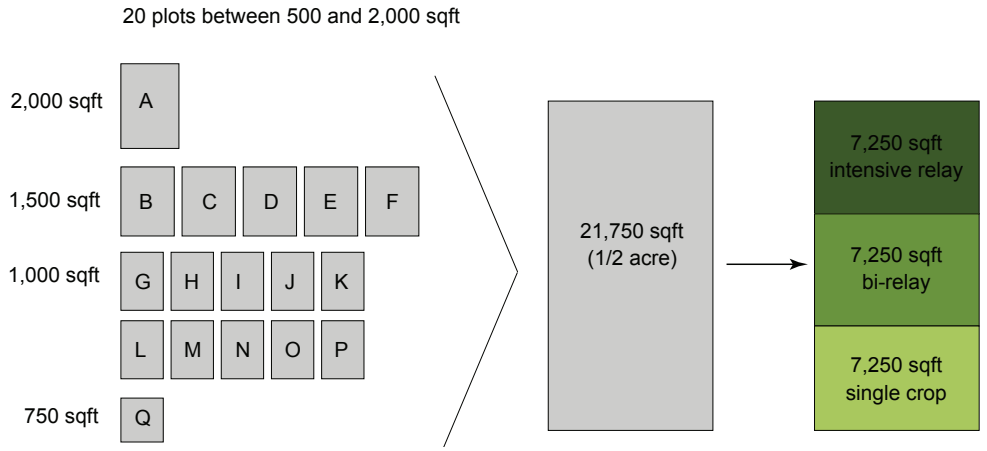


FIGURE 22.4 - Schematic Diagram of a Typical "Intermediate" SPIN® Farm.

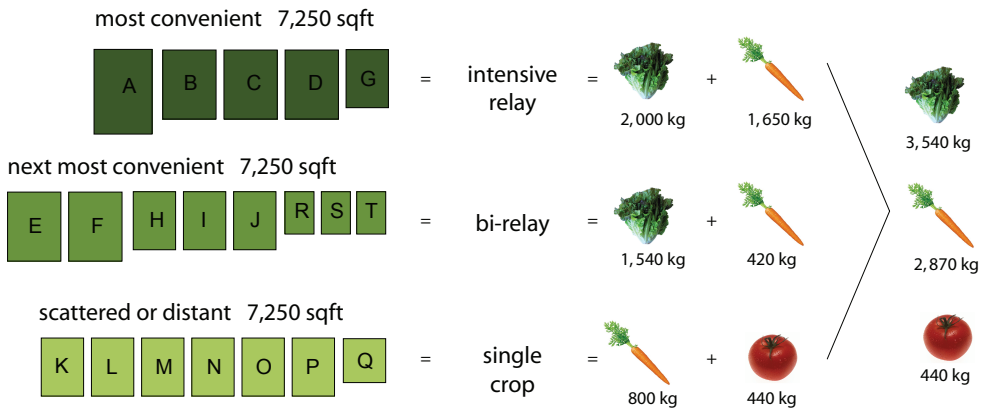


FIGURE 22.5 - Estimated Total Yield of a Typical "Intermediate" SPIN® farm. See Appendix Three for further details.

Saskatchewan Adaptation

Developed in Saskatoon, no adjustments need to be made to the model in order to account for climatic differences. However, after some experimentation with warm-weather crops it is believed that Mr. Satzewich has removed them from his crop repertoire, and currently only grows root crops on his single-crop areas. Thus, the SPIN® farmer in the developed model will dedicate his single-crop plots exclusively to root vegetables as well.

The result is a system that with two operators and half an acre of land (in plots ranging from 200 sq. ft. to the full 1/2 acre if available) can produce approximately 3,540 kg of cool weather vegetables and 3,640 kg of root vegetables from early June to mid September, while providing approximately $50,000 of income to the small farmer.

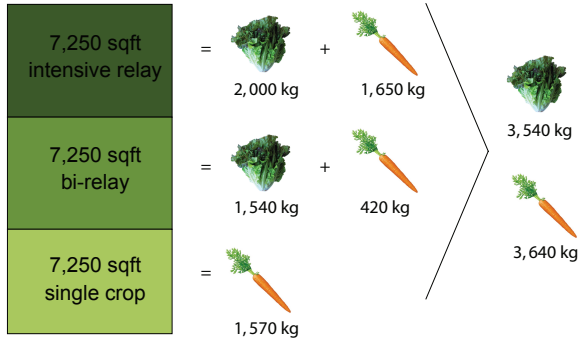


FIGURE 22.6 - Yield illustration of the "Saskatchewan Adaptation" of the Half-acre SPIN® Vegetable Farmer
See Appendix Three for calculations.

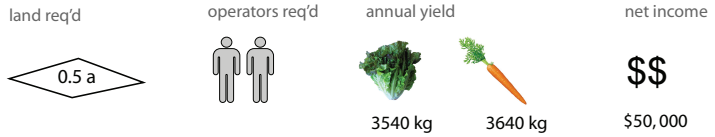


FIGURE 22.7 - System Summary of the "Saskatchewan Adaptation" of the Half-acre SPIN® Vegetable Farmer



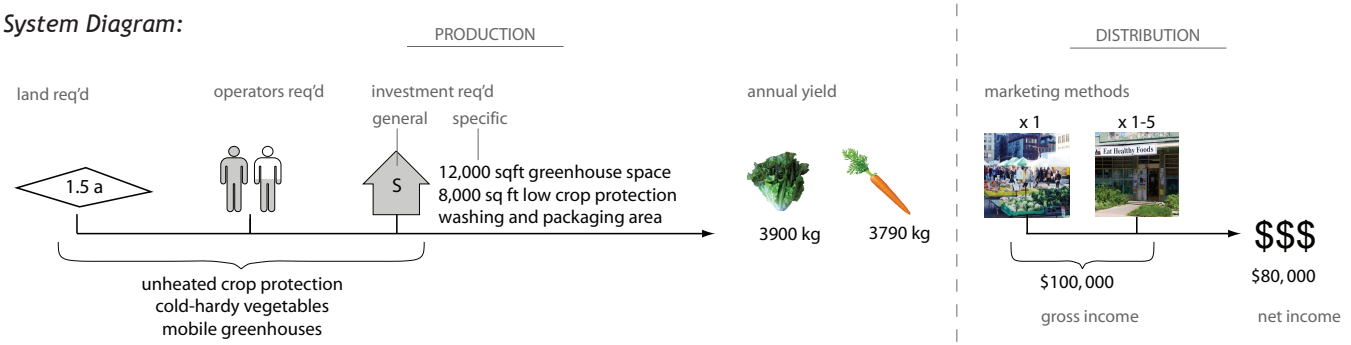
2.2 Protected Intensive Vegetable Production

Model Farm

Four-Season Farm
Harborside, Maine.

Using "deep organic" principles and relying only on the free energy from the sun, Eliot along with his wife Barbara are able to harvest approximately 7,700 kg of fresh winter vegetables from their 1.5 acre *Four Season Farm* in Harborside Maine every year. Grown and sold exclusively on the "back-side of the calendar" (from October to May) Coleman's system not only provides residents with fresh cool-weather and root vegetables throughout the bleakest winter months, but by grossing $100,000 US/yr, establishes an economically rewarding agricultural system for the small-scale producer as well. The following study briefly looks at how they are able to do this, and develops a variation on said model that could work to estimate the requirements and production capacity of such a system on the Canadian Prairies.

System Diagram:



Principles of the System:

Unheated Crop Protection

Unlike conventional greenhouse operations that combat winter's cold by adding heat (and summer's heat by cooling), Coleman has taken cues from historic European all-winter gardens, where simple crop protection systems layered on top of each other create a "protected microclimate" which taken together temper winter conditions enough to grow a wide variety of hardy winter vegetables without any supplementary heat.

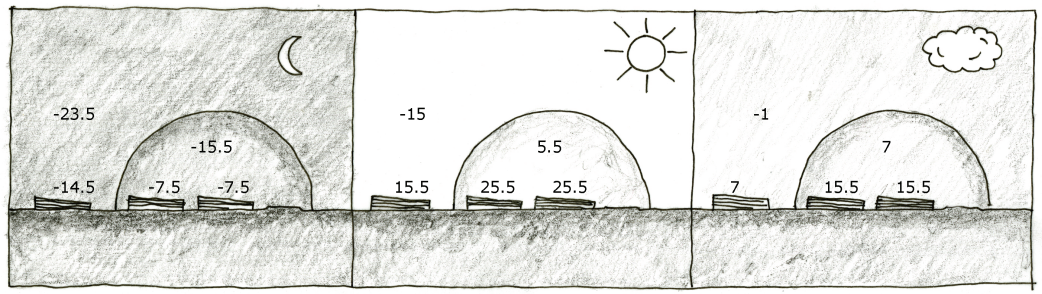


FIGURE 22.8 - Sample Temperatures (in degrees Celsius) taken by Eliot Coleman Illustrating the Climate Tempering Effects of Single and Double Layers of Unheated Crop Protection in Varying Winter Conditions

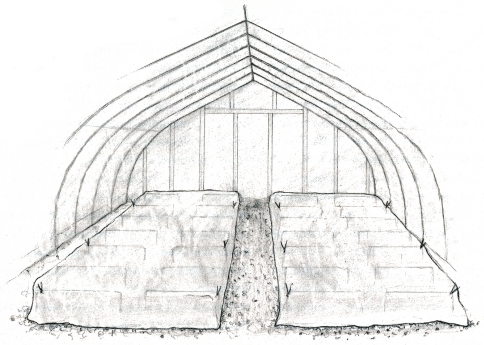


FIGURE 22.9 - The "Twice-tempered" Crop Protection System on Eliot Coleman's Four Season Farm.

After years of experience in a coastal Maine climate, Coleman's protection system is comprised of a simple single-layered polyethylene high tunnel over a system of lightweight fabric row covers. This provides both adequate climate tempering to harvest fresh vegetables throughout the winter, as well as allows easy access to the plants for harvesting while providing climate protection for the harvesters themselves.

Cold-hardy Vegetables

Creating only a tempered not warmed environment, the vegetables in such a system need to be carefully chosen for their hardiness. Surprisingly, the list of "winter-harvest" vegetables grown by the Coleman's (the majority of which are hardy up to -13ºC when protected from the elements) is over 30 names long. This includes common cool-weather vegetables such as spinach, chard, carrots, scallions and radish, along with less common leafy greens such as mache, claytonia, minutina and arugula. By paying special attention to planting dates in the fall, as well as keeping up with succession plantings throughout the winter, a harvest of these fresh vegetables can be collected from early October, throughout the coldest winter months, until the following May.

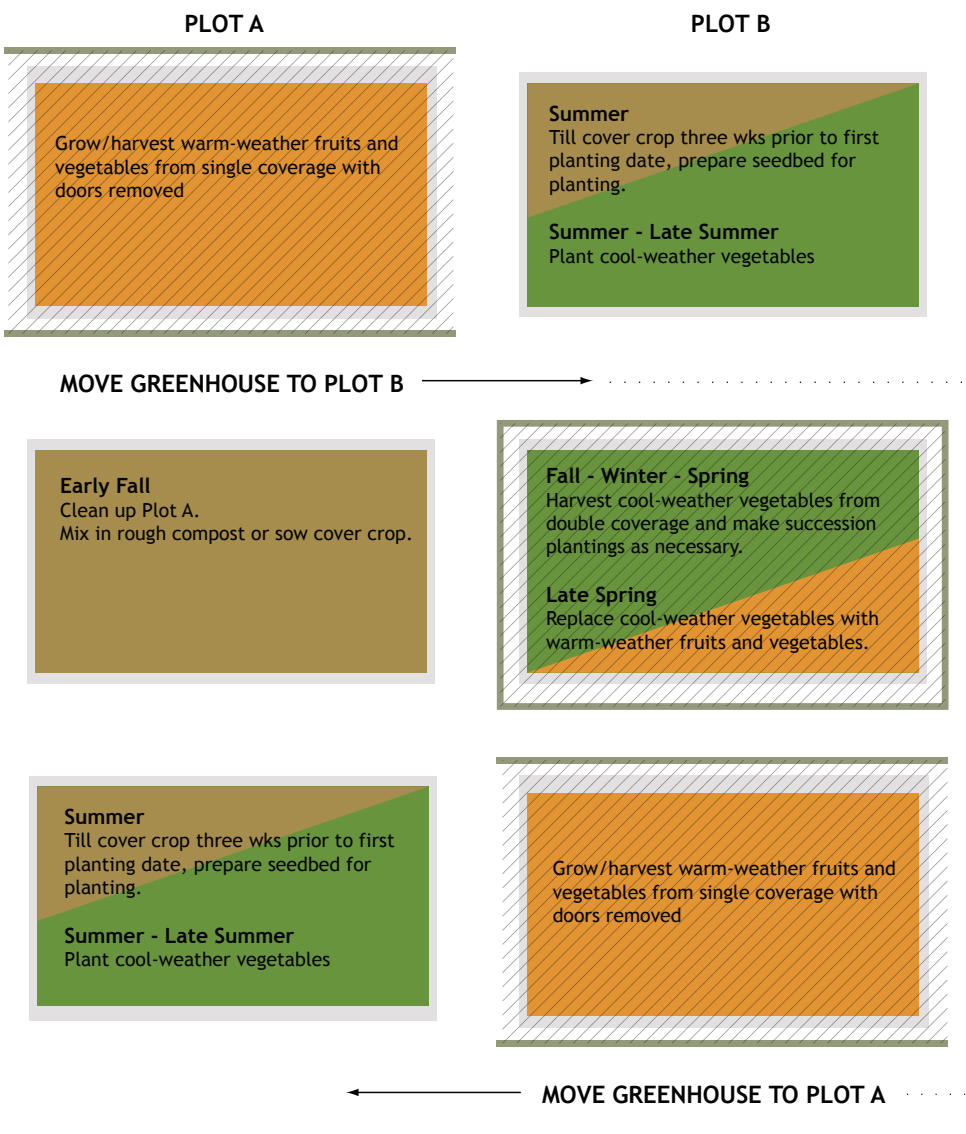
Mobile Greenhouses

Although the system works fine with stationary greenhouses, the Coleman's have maximized its potential by making their high tunnels mobile – again taking inspiration from European example. Instead of sinking a tunnel's hoop structure into the ground, it is fixed to a 2x4" wooden frame, which is then run along "rails" (2x6" timbers sunk into the ground) spanning multiple plots. In this way, the structure can simply be pulled from one plot to another as shown in Figure 22.10.



FIGURE 22.10 – Fixed to a 2x4" wooden frame and slid along a 2x6" wooden "rail" that spans multiple plots, the Coleman's high tunnels are easily shared between adjacent plots.

Not only is this extremely efficient (as it allows multiple plots to benefit from only one greenhouse throughout any given season), but it is also key to the Coleman's "deep organic" strategy, as it becomes feasible for each plot to be uncovered and planted to a leguminous green manure for at least one out of every two years. Not only does this contribute significantly to the maintenance of soil fertility, but by periodically exposing every plot to the cleaning elements of nature the need for chemical insecticides and fungicides typically required in commercial greenhouses today is greatly reduced. See Figure 22.11.



YEAR 1

Summer - While Plot B is being planted to cool-weather vegetables, the greenhouse (with both ends open), provides better growing conditions for warm-weather vegetables on Plot A.

Early Fall As warm-weather vegetables finish, the greenhouse is moved to Plot B where it provides warmer growing conditions and protection to the cool weather vegetables, while the newly exposed Plot A is planted to a leguminous green manure.

Fall - Winter - Spring

The greenhouse provides the outer layer of coverage for harvesting (and replanting as necessary) winter vegetables on Plot B, while Plot A is exposed to the cleaning elements of nature. By late spring, the cool weather vegetables under greenhouse cover on Plot B are being replaced by warm-weather ones, while the leguminous green manure on plot A has grown substantially.

YEAR 2

Summer - With both ends open, the greenhouse now provides better growing conditions for the warm-vegetables on Plot B, while three weeks after tilling Plot A, and new cool weather crop is planted.

Early Fall And so, the cycle repeats itself, but on opposite plots, with Plot B now being exposed as its warm-weather vegetables finish, while Plot A becomes covered as greenhouse provides protection for the newly planted cool-weather vegetables that will provide the next year's winter harvest.

FIGURE 22.11 - In sharing one greenhouse between two sites, a system of crop rotation that not only maximizes the use of structure, but also allows for each plot to be planted to a leguminous green manure and exposed to the elements for one out of every two years, is made possible.

Source Farm Capacity

After perfecting this system of year-round harvest however, the Colemans realized that because of the workload, they couldn't be both summer and winter farmers. They chose winter. In order to make up for the loss in revenue previously generated by warm-weather vegetables, to their winter crop repertoire of cold-hardy leafy greens they added root vegetables, that although grown in the summer, require very minimal work and can be sold in the winter alongside their greenhouse "winter harvest".

In order to understand the production capacity, as well as translate the developed system to the Saskatchewan context, the Coleman's farm has been broken down into roughly eight units of crop production. With room for roughly twenty-two 30' x 50' plots (their preferred size of mobile greenhouse) on 1.5 acres, each crop unit contains a cool-weather vegetable plot, a green manure plot, and a root vegetable plot. Using standard yields and typical crop spacing (see Appendix Three), it has been estimated that each of these eight "units" can produce approximately 490 kg of cool-weather along with 475 kg of root vegetables a season - for a farm total of approximately 7,700 kg of fresh vegetables every year.

Sold at local stores and farmers' markets during what is typically the off-season, the Coleman's fresh winter vegetables fetch a premium price, typically totaling $100,000/year in gross sales. (Ableman 2005, 173) With very few input and operating costs, the Colemans are able to keep the majority of these earnings as income every year.

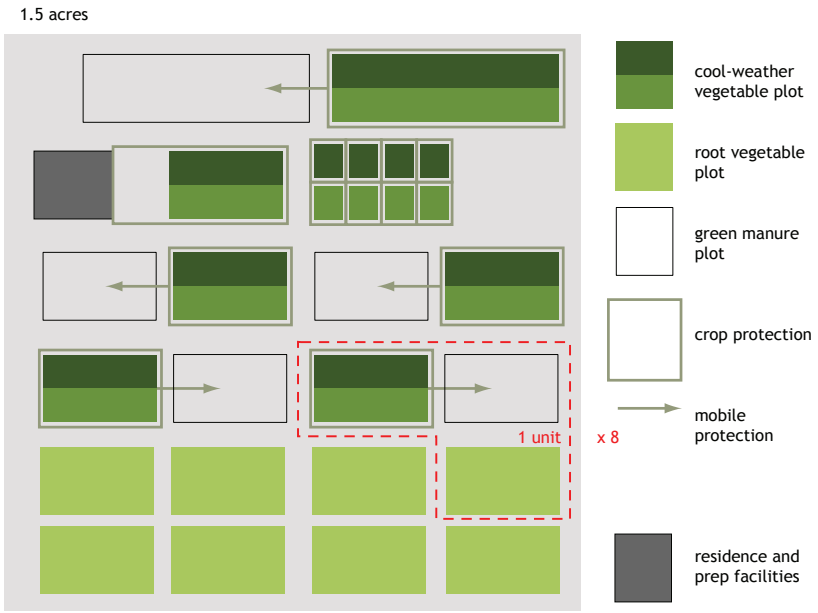


FIGURE 22.12 - Schematic Diagram of Eliot Coleman's 1.5 acre Farm. In order to estimate capacity and translate the system, the farm has been broken down into eight "crop units" each containing three 30'x50' plots, of which two are in crops at any given time.

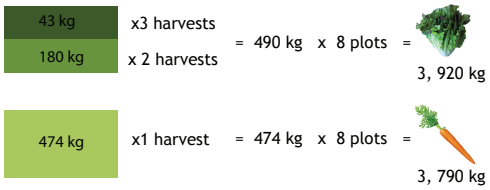


FIGURE 22.13 - Estimated Total Yield of the Coleman's Four Season Farm. See Appendix Three for calculations.

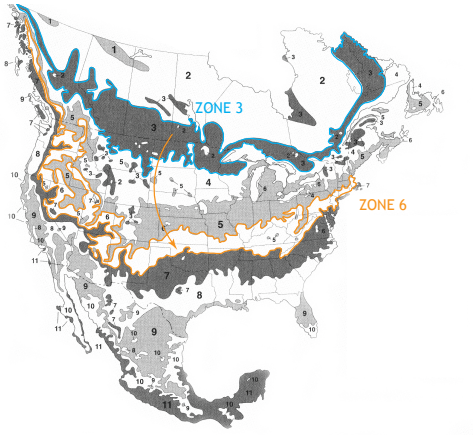


FIGURE 22.14 - Coleman estimates that for every layer of crop protection added, the growing environment is "tempered" the equivalent of moving 1.5 USDA hardiness zones to the south.

Although it may be unrealistic to assume a harvest of fresh vegetables year-round from such a system in a climate as severe as southern Saskatchewan's, using Eliot's calculations it would still be possible (with a double-layer crop protection system) to temper the environment from a Zone 3 to a Zone 6 USDA hardiness rating (see Figure 22.14), thus extending the growing season by as much as four weeks on either side of the calendar.

With this in mind, as well as the ambition to provide farmers a similar rest period as well as income as the Colemans, two models have been developed - *The Early Farmer*, and *The Late Farmer* - that although require different amounts of land, harvest approximately the same number of crop units, which to the author's understanding should equate to a roughly similar work load as well as economic return as the Coleman's *Four Season Farm*. See Figure 22.15.

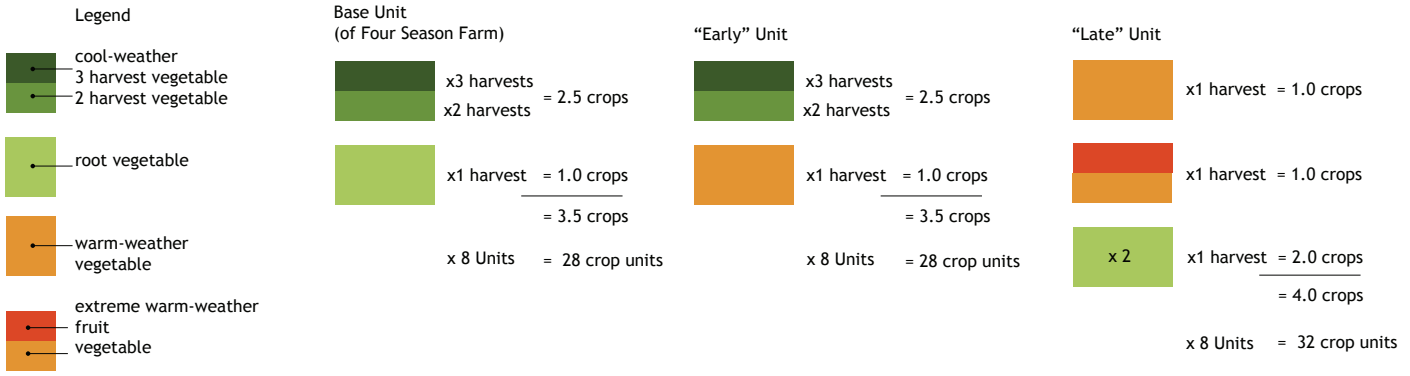


FIGURE 22.15 - The Roughly Equal "Crop Units" of Four-Season Farm, the "Early" Farmer, and the "Late" Farmer.

The "Early" Vegetable Farmer

The so-called *Early Vegetable Farmer* begins his season in the middle of March, utilizing the microclimate of the mobile greenhouse to start plots of cool-weather vegetables about a month earlier than is traditionally possible. Then, once it is safe for these vegetables to be exposed (around the beginning of May in Saskatchewan) the greenhouse is shifted to an adjacent plot where it is used to start warm-weather vegetables, again weeks earlier than is traditional.

By maintaining succession planting on cool-weather plots all spring, and opening doors on the greenhouses protecting warm weather plots as required, it is estimated that 3,920 kg of cool-weather and 1,940 kg of warm weather vegetables can be collected from the 1.1 acre Early Farm by early summer. At this time, exposed plots can be sown to leguminous green manure, and rough compost added to covered plots, leaving the farmer with a rest period from early fall to very early spring – when he begins the cycle all over again, this time on reversed plots.

And although produced a little earlier than the traditional season, it is not likely that *The Early Farmer*'s produce will fetch as good of prices as the Colemans'. Thus with an estimated gross income of $70,000, minus a few less expenses than the Colemans (due to the fact they are not growing during deep winter), *The Early Farmer* may be able to clear approximately $60,000/year.

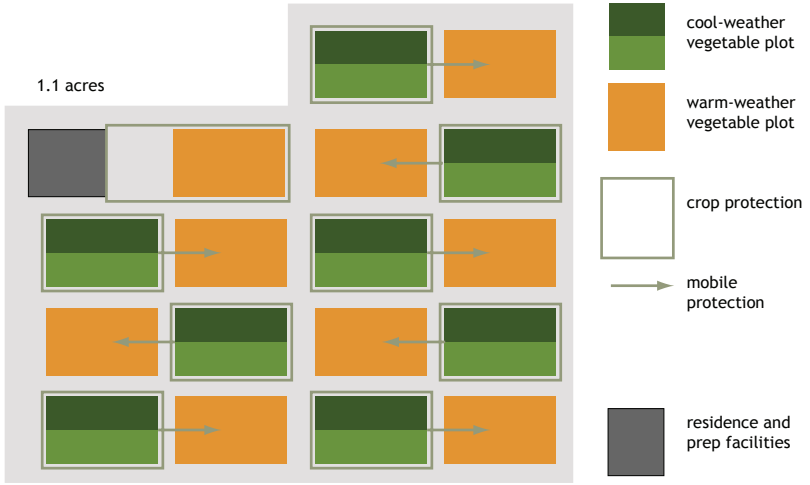


FIGURE 22.16 - Schematic Diagram of the "Early" Vegetable Farm in Southern Saskatchewan.

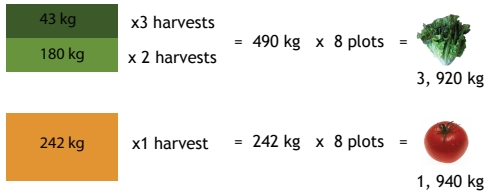


FIGURE 22.17 - Estimated Total Yield of the "Early" Vegetable Farmer. See Appendix Three for calculations.

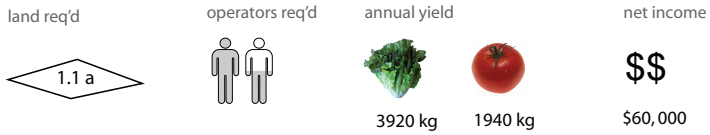


FIGURE 22.18 - System Summary of the "Early" Vegetable Farmer

The "Late" Vegetable Farmer

Using a strategy similar to *The Early Farmer*, *The Late Vegetable Farmer* also utilizes mobile greenhouses to extend the growing season – however later into fall rather than earlier into spring. And so, greenhouses in this case, are used to start warm-weather vegetables earlier than usual (beginning of May), then when it is safe for the vegetables to be exposed, the structures shifted to adjacent plots where fruits and vegetables that enjoy much warmer temperatures than is typical on the Prairies are planted. From early summer to early fall vegetables are harvested from the exposed plot, with harvest on the protected plot starting a little later, but extending into late fall.

Because these warm-weather plots typically yield only one crop per season, the Late Farmer also plants root vegetables (2 plots per unit) in order to make the operation economically feasible. These are planted alongside the "warm-weather" and "extremely warm-weather" plots in late spring, and require minimal maintenance all summer, but contribute significantly to the amount of saleable produce from late summer to early fall.

Since *The Late Farmer* is able to produce fruits and vegetables that may otherwise be difficult or impossible to grow on the Prairies, he may be able to earn a figure closer to the Coleman's - a gross income of $80,000 perhaps. With no greater inputs than *The Early Farmer, The Late Farmer* could take home $70,000.

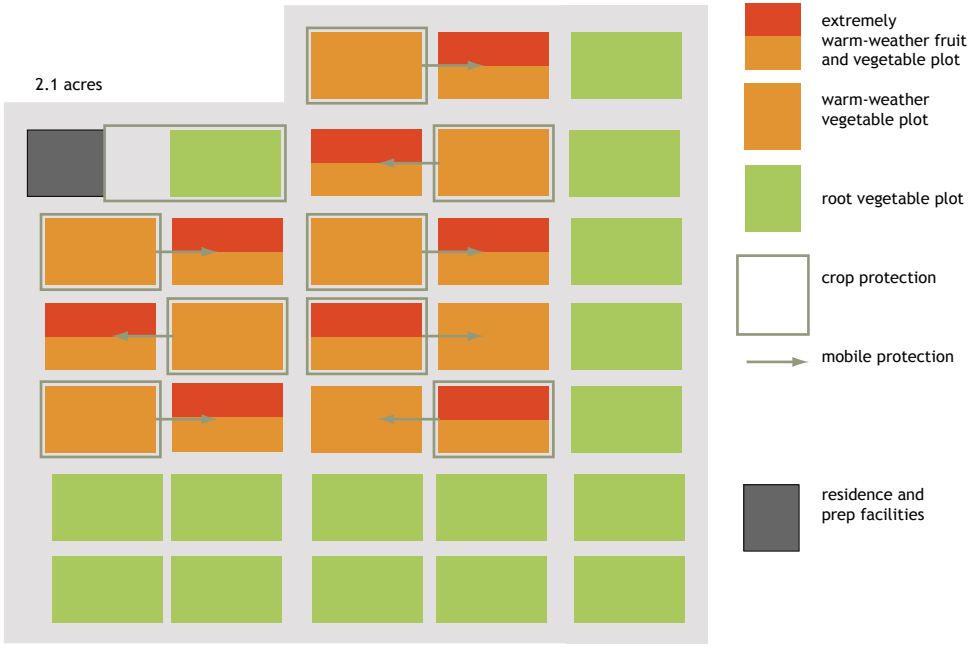


FIGURE 22.19 - Schematic Diagram of the "Late" Vegetable Farm in Southern Saskatchewan.

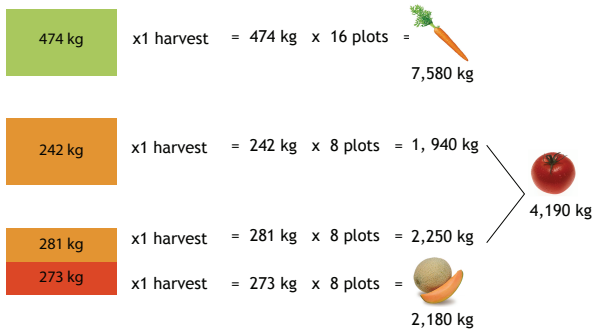


FIGURE 22.20 - Estimated yield of the "Late" Vegetable Farmer." See Appendix Three for calculations.



FIGURE 22.21 - System Summary of the "Late" Vegetable Farmer.



2.3 Integrated Holistic Fruit and Animal Production

Developed Model

Preface to the developed model

Although Saskatchewan is not usually thought of as having a climate amenable to fruit production (as many varieties of the most commonly cultivated species such as plum, apple, pear, cherry, strawberry and raspberry are not able to survive harsh Prairie winters) there is still a significant number of fruit species (as well as varieties within those species) that can be successfully grown on the Prairies. Along with cold-hardy cultivars of apples, raspberries, strawberries, black currents, and sour cherries, many native fruits such as Saskatoon berry, choke cherry, lingonberry, buffaloberry, and high-bush cranberry, can be successfully grown by the small-scale Prairie producer. And in fact, researchers have recently reported that the province's warm, sunny, dry summers can actually be advantageous in producing fruit of enhanced quality, with decreased risk of pests and disease (St-Pierre 1992) – a major advantage to anyone attempting to produce fruit without chemicals such a climate.

And so, combining this information together with information gleaned from two example farms (Meeting Place Organic Farm in Ontario and Lost Nation Orchard and Cider Mill in New Hampshire), as well as *The Apple Grower: A guide for the Organic Orchardist*, a model of "Integrated Holistic Fruit and Animal Production" for the Prairies has been developed.

The Saskatchewan Model

Although both serving other primary purposes, when taken together the shelterbelt of native trees and bushes (primarily for wind protection) and the 10 acres of native grass pasture (necessary forage for the farm's 10-head herd sheep) help to establish the wild diversity necessary for successful holistic fruit production on the Prairies; while intentional species stacking of sheep in the apple orchard and plant inter-cropping in the berry plots maximizes the production capacity of the limited land base while capitalizing on the ecologically beneficial relationships between species, and the economic benefits of a diversified income for the farmer.

The inclusion of Manitoba maples in the shelterbelt, as well as provisions for keeping the 10 hives required for fruit pollination further diversify this income, while the small-scale processing of some second grade as well as uncommon fruits (such as sour cherry, lingonberry, choke cherries and rhubarb) on-site provides the opportunity for a source of value-added, year-round income.

Sold direct to customers either through on-farm or farmers' market sales, it is expected that such a farm could gross over $100,000/year (see Appendix Three), and since such a farm would have fairly minimal operating costs and required off-farm inputs, it is estimated that such a farm could support either two individuals living modestly, or one farm family living a little more comfortably.

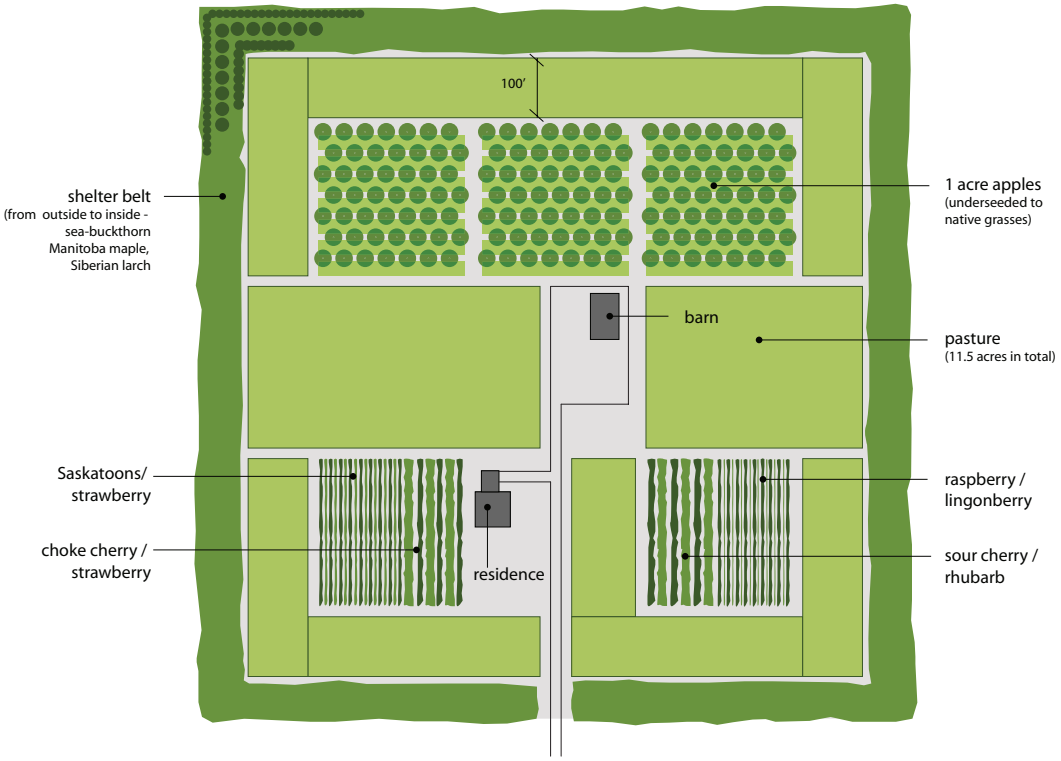


FIGURE 22.22 - Schematic Diagram of the Developed Model of Integrated Holistic Fruit Production on the Prairies.

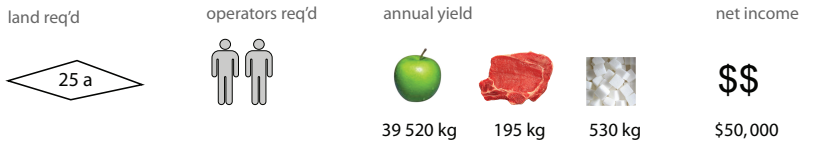


FIGURE 22.23 - System Summary of the Developed Saskatchewan Model of Integrated Holistic Fruit Production

Appendix Three Farm Model Yield Calculations

While the Saskatchewan yields of some farms (i.e. Grains and Cereals, Dairy, Mixed Livestock and Bison) were able to be estimated based on the given production figures of the investigated "model" farms, because of the restrictions regarding the types of fruits and vegetables that can be grown on the Prairies, in order to estimate the Saskatchewan yields of three farms – the SPIN® Vegetable Farm, the Protected Intensive Vegetable Farm, and the Integrated Holistic Fruit and Livestock Farm; a more detailed series of calculations was required.

The following section illustrates this for all three of the aforementioned models in the order listed.

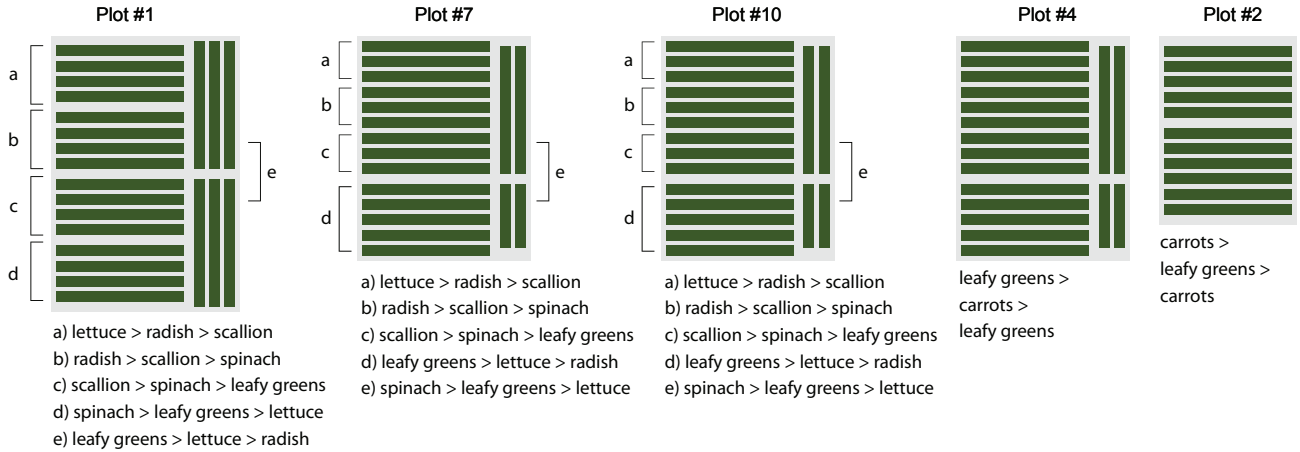


3.1 Small-Plot Intensive (SPIN®) Vegetable Production

In the case of the half-acre SPIN® farm, an estimated total yield was arrived at as the result of several exercises. First, diagrams illustrating the layouts (sizes and crop rotations) of all 20 plots as described in *SPIN® Farming #9* were constructed. Then, using a combination of "targeted bed yields" as dictated by the model, and common garden spacing and yields (for the crops in which "targeted yields" were unavailable), the amount of each type of crop produced was able to be estimated. By summing these together in terms of warm-weather, cool-weather, and root vegetables, the total yield of each was arrived at. And, since the only element of the system which changes for the "Saskatchewan Adaptation" of the model is the composition of the single crop plots, by replacing the yield figures of the "adapted" single-crop plots, with that of the original single-crop plots, yields for the Saskatchewan system are also arrived at.

Plot Layouts

Intensive-relay



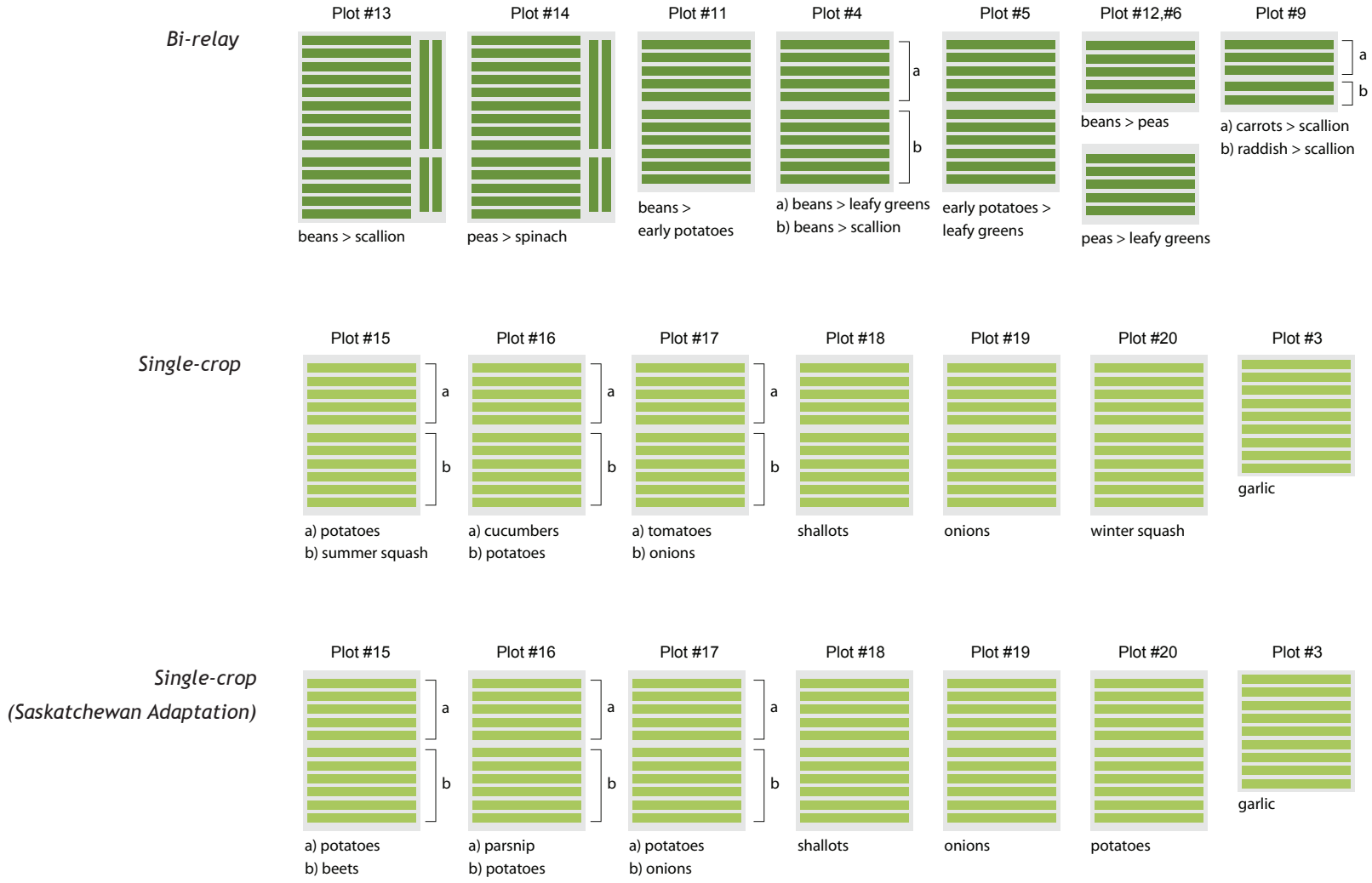


FIGURE 33.1 - Schematic Plot Layouts, Small-Plot Intensive Vegetable Production

Model Farm

	Average Yield (9) unless noted	Quantity Planted	Weight per Unit of Yield	Yield per crop (lbs)	kg conversion	Total Yield COOL veg (kgs)	Total Yield ROOT veg (kgs)	Total Yield WARM veg (kgs)
Intensive Relay								
lettuce	40 lb/bed	36 beds	1	1440	0.454	654		
scallion	200 bunches/bed	30 beds	0.125 lb/bunch (7)	750	0.454	341		
spinach	20 lb/bed	30 beds	1	600	0.454	272		
leafy greens	20 lb/bed	81 beds	1	1620	0.454	735		
radish	60 bunches/bed	36 beds	0.33 lb/bunch (9)	713	0.454		324	
carrots	100 lb/100 ft	29.25 (2925 row feet)	1	2925	0.454		1328	
						2002	**1652**	**0**
Bi-relay								
spinach	20 lb/bed	17 beds	1	340	0.454	154		
leafy greens	20 lb/bed	21 beds	1	420	0.454	191		
scallion	200 bunches/bed	28 beds	0.125 lb/bunch (7)	700	0.454	318		
peas	2 bu/100 ft (1)	12.25 (1225 row feet)	25 lb/bu (11)	613	0.454	278		
beans	2 bu/100 ft (1)	22 (2200 row feet)	30 lb/bu (11)	1320	0.454	599		
carrots	100 lb/100 ft	2.25 row feet	1	225	0.454		102	
radish	60 bunches/bed	2 beds	0.33 lb/bunch (9)	40	0.454		18	
early potatoes	2 bu/100 ft (7)	5.5 (550 row feet)	60 lb/bu (2)	660	0.454		300	
						1540	**420**	**0**
Single-crop								
garlic	1 bu/100 ft (7)	3.5 (350 row feet)	50 lb/bu (7)	175	0.454		79	
potatoes	3 bu/100 ft (1)	4.5 (450 row ft)	60 lb/bu (2)	810	0.454		368	
onions	1.5 bu/100 ft (1)	6.75 (675 row ft)	55 lb/bu (2)	557	0.454		253	
shallots	1 bu/100 ft (7)	4.5 (450 row feet)	50 lb/bu (7)	225	0.454		102	
sum. squash	135 lb/100 ft (1)	2.25 (225 row ft)	1	304	0.454			138
cucumber	1.5 bu/100 ft (1)	2.25 (225 row ft)	48 lb/bu (2)	162	0.454			74
tomatoes	3 bu/100 ft (1)	2.25 (225 row ft)	55 lb/bu(2)	371	0.454			169
win. squash	30 lb/100 ft (1)	4.5 (450 row ft)	1	135	0.454			61
						0	**802**	**441**
					TOTAL	**3540**	**2875**	**440**

FIGURE 33.2 - Yield Calculations, Small-Plot Intensive Vegetable Production, Model Farm

	Average Yield (9) unless noted	Quantity Planted	Weight per Unit of Yield	Yield per crop (lbs)	kg conversion	Total Yield COOL veg (kgs)	Total Yield ROOT veg (kgs)	Total Yield WARM veg (kgs)
Intensive Relay								
lettuce	40 lb/bed	36 beds	1	1440	0.454	654		
scallion	200 bunches/bed	30 beds	0.125 lb/bunch (7)	750	0.454	341		
spinach	20 lb/bed	30 beds	1	600	0.454	272		
leafy greens	20 lb/bed	81 beds	1	1620	0.454	735		
radish	60 bunches/bed	36 beds	0.33 lb/bunch (9)	713	0.454		324	
carrots	100 lb/100 ft	29.25 (2925 row feet)	1	2925	0.454		1328	
						2002	**1652**	**0**
Bi-relay								
spinach	20 lb/bed	17 beds	1	340	0.454	154		
leafy greens	20 lb/bed	21 beds	1	420	0.454	191		
scallion	200 bunches/bed	28 beds	0.125 lb/bunch (7)	700	0.454	318		
peas	2 bu/100 ft (1)	12.25 (1225 row feet)	25 lb/bu (11)	613	0.454	278		
beans	2 bu/100 ft (1)	22 (2200 row feet)	30 lb/bu (11)	1320	0.454	599		
carrots	100 lb/100 ft	2.25 row feet	1	225	0.454		102	
radish	60 bunches/bed	2 beds	0.33 lb/bunch (9)	40	0.454		18	
early potatoes	2 bu/100 ft (7)	5.5 (550 row feet)	60 lb/bu (2)	660	0.454		300	
						1540	**420**	**0**
Single-crop								
garlic	1 bu/100 ft (7)	3.5 (350 row feet)	50 lb/bu (7)	175	0.454		79	
potatoes	3 bu/100 ft (1)	11.25 (1125 row ft)	60 lb/bu (2)	2025	0.454		919	
onions	1.5 bu/100 ft (1)	6.75 (675 row ft)	55 lb/bu (2)	557	0.454		253	
shallots	1 bu/100 ft (7)	4.5 (450 row feet)	50 lb/bu (7)	225	0.454		102	
beets	2 bu (1)	2.25 (225 row ft)	56 lb/bu (2)	252	0.454		114	
parsnip	2 bu/100 ft (2)	2.25 (225 row ft)	50 lb/bu (11)	225	0.454		102	
						0	**1570**	**0**
					TOTAL	**3540**	**3640**	**0**

FIGURE 33.3 - Yield Calculations, Small-Plot Intensive Vegetable Production, Saskatchewan Adaptation

References

1 Rodale, Robert. Basic Book of Organic Gardening, 1971.
2 http://chestofbooks.com/gardening-horticulture/farming/Farm-And-Garden-Rule-Book/Legal-Weights-of-the-Bushel.html
3 http://www.uky.edu/Ag/HLA/anderson/greenhousetomatotrials.pdf
4 Chesman, Andrea. The Garden-Fresh Vegetable Cookbook, 2005.
5 Coleman, Eliot. Winter-harvest Manual, 1998.
6 author's estimation
7 author's estimation
8 http://www.ext.vt.edu/news/periodicals/commhort/pulledarticles/2004-11/article1.html
9 Satzewich and Christensen. SPIN Farming #9, 2005.
10 http://www.tonytantillo.com/vegetables/celery.html
11 http://www.arhomeandgarden.org/fruits_nuts_vegs/Vegetables/weights_vegetables.htm



3.2 Protected Intensive Vegetable Production

In the case of Protected Intensive Vegetable Production, yields were determined slightly differently. Based on the Coleman's preferred size of greenhouse, typical crop types, plant spacing, and crop rotations, four 30' x 50' crop "units" - one for each type of crop (see below) was outlined. Then, utilizing typical crop spacing and yields, combined with the number of harvests possible per crop per year, the total yield of each crop "unit" was able to be determined. Following this, determining the yield of each farm model was as simple as multiplying these per-unit yields by the number of each type of unit accommodated, and summing them together.

Plot Layouts



Cool-Weather Vegetable Unit

=

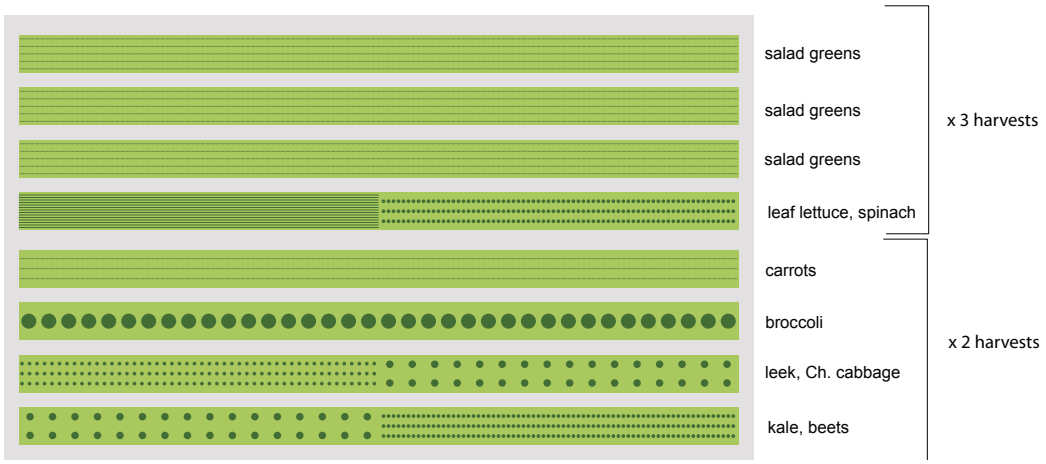
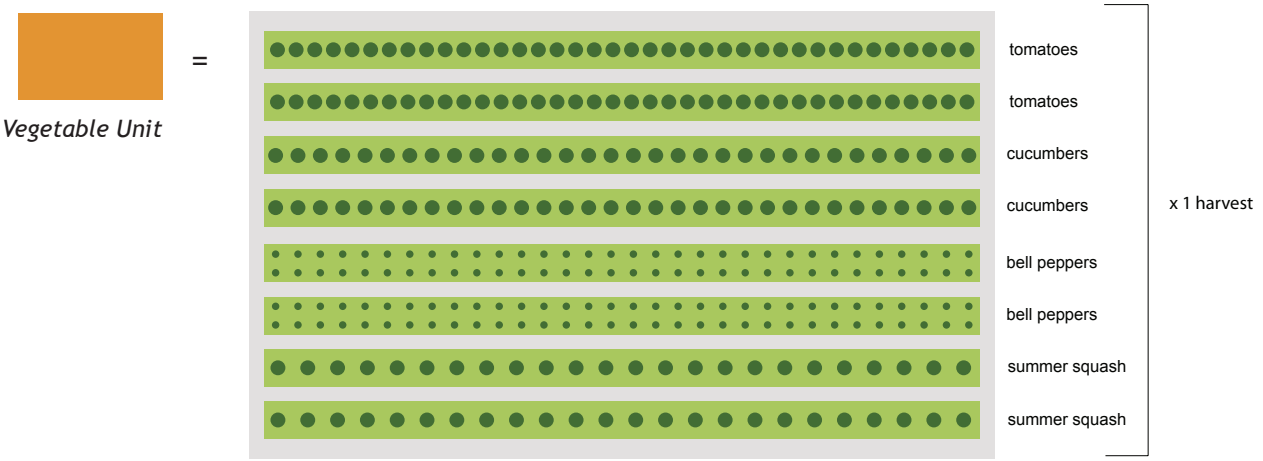


FIGURE 33.4 - Schematic Diagram, Cool-Weather Vegetable Unit



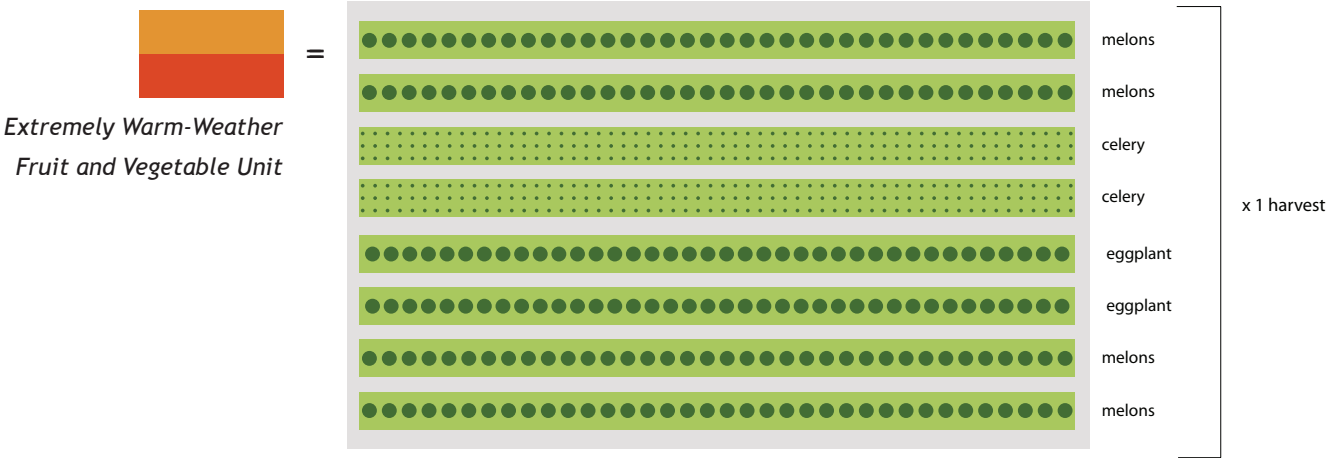
Root Vegetable Unit

FIGURE 33.5 - Schematic Diagram, Root Vegetable Unit



Warm-Weather Vegetable Unit

FIGURE 33.6 - Schematic Diagram, Warm-Weather Vegetable Unit



Extremely Warm-Weather Fruit and Vegetable Unit

FIGURE 33.7 - Schematic Diagram, Extremely Warm-Weather Fruit and Vegetable Unit

Yield Calculations

Cool-weather Vegetable Plot	average yield (1) unless noted	quantity planted	weight per unit yield	**Crop Yield (lbs)**	Plot Yield (lbs)	Plot Yield (kgs)	no. harvests	**Total Yield (kgs)**
salad greens	3 lb/50sqft (9)	7.5 (x50 sqft)	1	22.5				
leaf lettuce	3 lb/50sqft (9)	1.25 (x50 sqft)	1	3.75				
spinach	3 bu/100 row ft	0.75 (x100 row ft)	30 lb/bu (2)	67.5	93.75	**43**	3	**128**
carrots	100 lb/100 row ft	1.5 (x100 row ft)	1	150				
broccoli	45 heads/100 row ft	0.5 (x100 row ft)	1 lb/head (4)	22.5				
leeks	200 plants/100 row ft	0.75 (x100 row ft)	0.5 lb/plant (4)	75				
Ch. Cabbage	70 heads/100 row ft	0.5 (x100 row ft)	1 lb/head (7)	35				
kale	2 bu/100 row ft	0.5 (x100 row ft)	30 lb/bu (2)	30				
beets	2 bu/100 row ft	0.75 (x100 row ft)	56 lb/bu (2)	84	397	**180**	2	**360**

Warm-weather Vegetable Plot	average yield (1) unless noted	quantity planted	weight per unit yield	Crop Yield (lbs)	Plot Yield (lbs)	Plot Yield (kgs)	no. harvests	Total Yield (kgs)
tomatoes	3 bu/100 row ft	1 (x100 row ft)	55 lb/bu(2)	**165**				
sum. squash	135 lb/100 row ft	1 (x100 row ft)	1	**135**				
cucumber	1.5 bu/100 row ft	1 (x100 row ft)	48 lb/bu (2)	**72**				
bell peppers	4 bu/100 row ft	2 (x100 row ft)	20 lb/bu (6)	**160**	532	**242**	1	**242**

Root Vegetable Plot	average yield (1) unless noted	quantity planted	weight per unit yield	Crop Yield (lbs)	Plot Yield (lbs)	Plot Yield (kgs)	no. harvests	Total Yield (kgs)
cabbage	175 lb/100 row ft	1 (x100 row ft)	1	175				
potatoes	3 bu/100 row ft	1 (x100 row ft)	60 lb/bu	180				
onion	1.5 bu/100 row ft	3 (x100 row ft)	55 lb/bu (2)	247.5				
turnip	2 bu/100 row ft	4 (x100 row ft)	55 lb/bu (2)	440	1043	**474**	1	**474**

Extremely Warm-weather Fruit and Vegetable Plot	average yield (1) unless noted	quantity planted	weight per unit yield	Crop Yield (lbs)	Plot Yield (lbs)	Plot Yield (kgs)	no. harvests	Total Yield (kgs)
eggplant	100 fruits/100 row ft	1 (x100 row ft)	1 lb/fruit (4)	100				
celery	115 plants (5)	3 (x100 row ft)	1.5 lb/plant (7)	517.5	618	**281**	1	**281**
melons	60 melons/100 row ft	2 (x100 row ft)	5 lb/melon (8)	600	600	**273**	1	**273**

FIGURE 33.8 - Yield Calculations - Cool-Weather, Root, Warm-Weather and Extremely Warm-Weather Vegetable Units

References

1 Rodale, Robert. Basic Book of Organic Gardening, 1971.
2 http://chestofbooks.com/gardening-horticulture/farming/Farm-And-Garden-Rule-Book/Legal-Weights-of-the-Bushel.html
3 http://www.uky.edu/Ag/HLA/anderson/greenhousetomatotrials.pdf
4 Chesman, Andrea. The Garden-Fresh Vegetable Cookbook, 2005.
5 Coleman, Eliot. Winter-harvest Manual, 1998.
6 author's estimation
7 author's estimation
8 http://www.ext.vt.edu/news/periodicals/commhort/pulledarticles/2004-11/article1.html
9 Satzewich and Christensen. SPIN Farming #9, 2005.
10 http://www.tonytantillo.com/vegetables/celery.html
11 http://www.arhomeandgarden.org/fruits_nuts_vegs/Vegetables/weights_vegetables.htm



3.3 Integrated Holistic Fruit and Animal Production

Because no appropriate source farm for "Integrated Holistic Fruit and Animal Production" was found, both the yields and income of such a farm were estimated by applying typical figures to the model farm developed by the author. As previously mentioned, the farm layout was determined by combining information gleaned from existing farms and literature, as well as current research at the University of Saskatchewan.

Berry Plot Diagrams

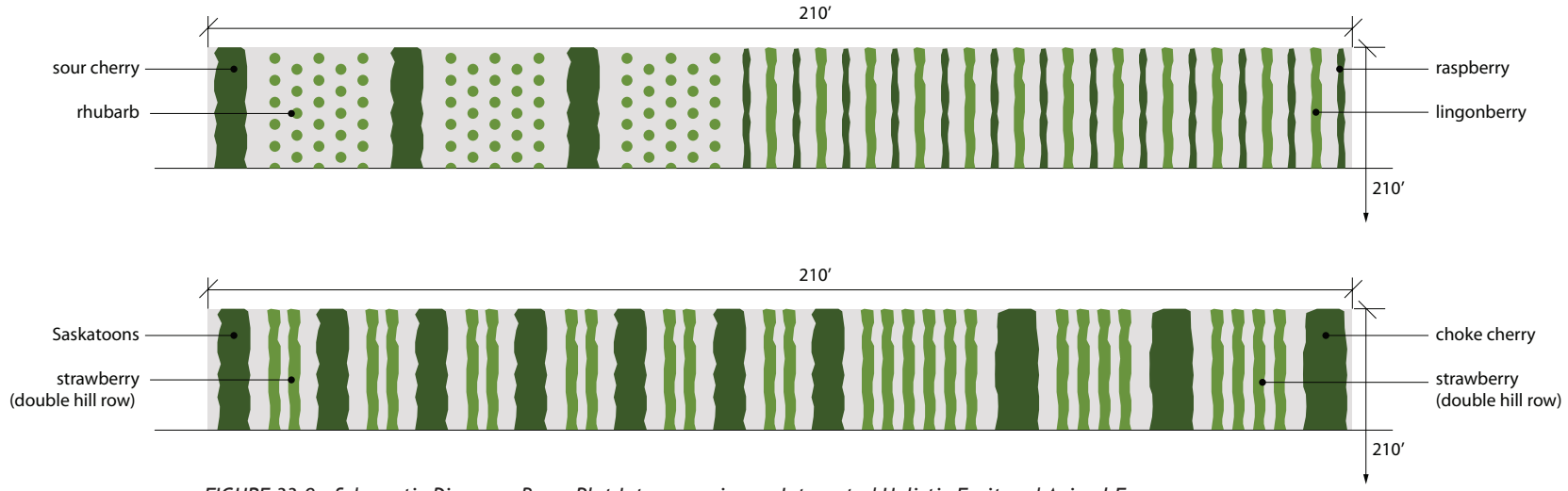


FIGURE 33.9 - Schematic Diagram, Berry Plot Inter-cropping on Integrated Holistic Fruit and Animal Farms

Yield / Income Calculations

temperate fruit	no. rows	row length	in-row spacing	plant yield	total yield	unit gross		total gross	net
apples (1)	3	1 acre	1	450 bu/acre (1)	29430 kg	$17,500 /1.5 acres (17)		$35,000	$20,000
Saskatoons (2)	7	210 feet	3 feet	3 kg	1470 kg	$3 /lb (picked) (18)	$6.60 /kg	$9,702	$4,851
raspberries (3)	13	210 feet	3 feet	1.4 kg (11)	1274 kg	$3 /liter (picked) (1.25lbs) (19)*	$2.40 /lb		
							$5.28 /kg	$6,727	$3,363
stawberries (7)	52	210 feet	1 foot	0.34 kg (8)	3713 kg	$11 /4 liter (picked) (5 lbs) (19)*	$2.20 /lb		
							$4.84 /kg	$17,970	$8,985
dwf. sour cherries (4)	3	210 feet	4.5 feet	12 kg	1680 kg	$4.50 /lb (process) (18.1)	$9.90 /kg	$16,632	$8,316
rhubarb (5)	13	210 feet	4 feet	1 kg (6)	683 kg		$9.90 /kg	$6,757	$3,378
choke cherry (9)	3	210 feet	4 feet	7 kg (10)	1103 kg		$9.90 /kg	$10,915	$5,457
lingonberry	24	210 feet	1	3.4 kg/100 sqft (11)	171 kg		$9.90 /kg	$1,696	$848
sea buckthorn									
					39523 kg			$105,399	$55,199
sugar/syrup									
honey		5 acres	2 hives/ acre	45 kg/hive (22)	450 kg	$8 /kg (23)		$3,600	
maple syrup (12)	1	3710 feet	20 feet	0.5 litres/tree (13)	80 kg (13.1)	$20 /liter (23)		$1,855	
					530 kg				
red meat									
lamb (14)	15	20 kg carcass		0.65 percent yield (15)	195 kg	$100 /lamb (16)		$1,500	$1,500
					195 kg				

FIGURE 33.10 - Yield/Income Calculations, Integrated Holistic Fruit and Animal Production

References

1 Phillips, Michael. The Apple Grower, p.97-98, 268.
2 http://www.prairie-elements.ca/saskatoons.html
3 http://www.saskfruit.com/studentwebsites/Raspberry%20Ziegler/raspberries/growers.html
4 http://www.dnagardens.com/Articles/borscherryguide.htm
5 Rodale, Robert. Basic Book of Organic Gardening, 1971.
6 http://www2.dpi.qld.gov.au/horticulture/5196.html
7 Madigan, Carleen. The Backyard Homesteader, p.86-90
8 http://www.plantanswers.com/garden_column/sept_02/1.htm
9 http://www.dnagardens.com/Articles/growing%20chokecherries.htm
10 http://www.prairie-elements.ca/papers/nativeyield.pdf
11 Madigan, Carleen. The Backyard Homesteader, p.117-124
12 http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1235600629132&lang=eng#a02-2
13 http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1199737719957&lang=eng
13.1 http://www.morsefarm.com/pages/history.php
93 liter = 25 gallons, if 1 gallon syrup contains 7 lbs maple sugar (above ref), then 80 kg of maple sugar
14 Lane, Marc. Personal conversation, Nov. 19, 2008.
15 http://www.ansci.wisc.edu/UW%20Meat%20Lab/sides.html
16 Lane, Marc. Personal conversation, Nov. 19, 2008.
17 Phillips, Michael. The Apple Grower, p.283.
http://www.vert-a-go.com/2008/07/13/u-pick-saskatoon-berry-season-gearing-up/
18 http://www.saskatoonfarm.com/proguideb.htm
18.1 this is the figure for Saskatoons, however assume sim. for other good processing berries
19 http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex3466
20 http://roysraspberries.com/
21 http://www.serviceberryfarms.com/picking_information.html
22 www.saskherbspice.org/Beekeeping%20in%20Sask%202004.ppt
23 typical rate at Cambridge Farmers' Market, April 25, 2009.
* use 4 liter pail = 5lbs berries as seems typical (20, 21)

Appendix Four Additional Information Regarding the Rural South-East Sector

Appendix contents:

4.1 Town Population Figures 260

4.2 Existing Rural Communities 261

4.3 Existing Initiatives Promoting Small-scale Sustainable Agriculture 268

4.4 Enlargement and Legend of Craik's "Green Map". 270

4.1 Town Population Figures

Covering statistics from 1981 to the present, the adjacent chart presents the population figures of all 25 communities within the Rural South-East Sector for the last 6 censuses. While the vast majority of towns have lost at least 30 percent of their populations within this time frame, many closer to 50 percent. There are a few exceptions to this, however. Several towns - Outlook, Hanley, Elbow and Glenside (shown in grey); appear to be "holding their own" (i.e. either achieving a kind of stasis or losing less than 10 percent of their populations in the same time period), while two towns - Dundurn and Mistusinne (shown in black) have actually been able to gain population. See each town description in the following section for a brief explanation in each case.

Town	Census Population Figures						Total % Pop. Change
	1981	1986	1991	1996	2001	2006	
Outlook	1976	2137	2091	2116	2129	1938	-1.9
Davidson	1166	1183	1115	1105	1035	958	-17.8
Dundurn	531	522	496	476	596	647	21.8
Hanley	484	493	499	491	495	464	-4.1
Craik	565	565	481	441	418	408	-27.8
Central Butte	548	548	562	521	439	372	-32.1
Imperial	501	414	364	382	339	321	-35.9
Elbow	319	323	327	295	298	294	-7.8
Kenaston	345	359	309	323	282	259	-24.9
Riverhurst	193	180	174	158	143	121	-37.3
Simpson	231	224	212	208	194	118	-48.9
Loreburn	201	179	170	150	143	113	-43.8
Tugaske	175	186	157	132	116	105	-40.0
Glenside	85	92	80	69	63	86	1.2
Broderick	101	117	93	86	83	77	-23.8
Hawarden	137	112	102	81	57	75	-45.3
Liberty	135	134	128	101	94	73	-45.9
Bladworth	124	120	111	76	67	70	-43.5
Mistusinne	3	16	23	18	31	56	1766.7
Strongfield	85	67	58	49	42	47	-44.7
Aylesbury	72	74	63	59	50	45	-37.5
Penzance	74	88	52	46	41	30	-59.5
Girvin	60	44	43	33	25	n/a	n/a
Lawson	20	n/a	n/a	n/a	n/a	n/a	n/a
Stalwart	n/a	n/a	n/a	n/a	n/a	n/a	n/a

n/a = not available as town status lost by this time.

FIGURE 44.1 - Town Population Figures, 1981 to 2006.

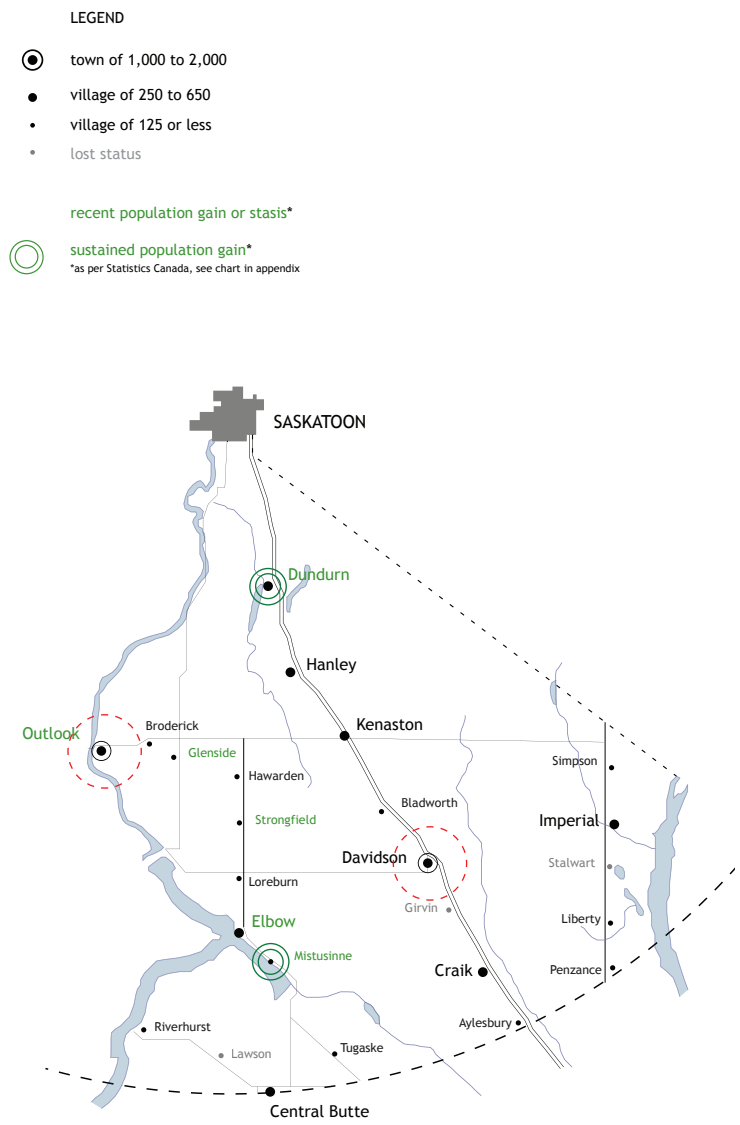


FIGURE 44.2 - The Two Largest Towns in the Sector: Outlook and Davidson

4.2 Existing Rural Communities

Discussed in order from most populous to least, the following section briefly describes all 25 towns within the rural portion of the South-East Sector, noting demographic trends, infrastructure and amenities available, as well as any other qualities that contribute to making every single one unique.

Outlook (1,938*) and Davidson (958)

With populations of 1,938 and 958 people respectively, Outlook and Davidson are currently the two largest towns in sector. As such, both boast a significant number of retail businesses and services, as well as community institutions that serve a fairly large area.

In addition to restaurants, hotels, grocery stores and hardware stores; public libraries, religious centers, elementary schools, recreational facilities and community centers, both Outlook and Davidson have many businesses relating to agricultural industry, secondary and post-secondary educational facilities, a wide range of health care facilities and practitioners, as well as many active community groups, extra-curricular programs and annual community events.

And although both towns are currently depopulating, in comparison to the rest of the towns in the sector, both have fared quite well - Outlook losing an average of only 2 percent of its population every census period since 1981, Davidson 5 percent.

* population figures as per Statistics Canada, 2006.

Dundurn (647), Hanley (464), Kenaston (259), and Craik (408)

After Davidson, Dundurn, Hanley, Kenaston and Craik are the next largest towns along Hwy. 11. As such, all four have been able to retain a good number of essential businesses and institutions. Besides restaurants, hotels, grocery stores and hardware stores; all four towns currently have at least a K-6 school, a public library, multiple churches, substantial recreational facilities and programs, as well as many active community groups. In addition to this, Craik currently has a healthcare center complete with resident doctor and pharmacy.

And although the latter three of these have been doing "okay" in terms of depopulation - with Hanley only losing an average of 4 percent of its population every five years since 1986, both Kenaston and Craik losing 7.5 percent - Dundurn has actually been able to gain population. As a result of the town's proximity to Saskatoon, Dundurn has been attracting commuters since the 1970s, most dramatically since the mid 1990s. Since that time, the town has been increasing its population by about 15 percent every census period - adding almost 200 people to its population in only 10 years.

And although the census of 2006 still revealed a 2 percent decline in population in Craik (from 418 to 408), according to area residents if taken today, these numbers "would be up," for it has been recognized the nearby Craik Sustainable Living Project has in fact attracted many individuals, families and small businesses to the area.

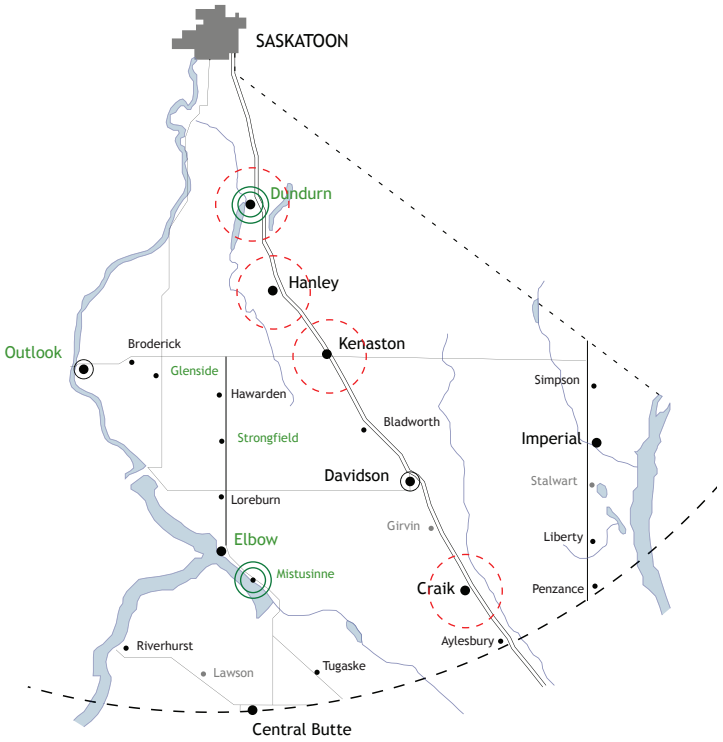


FIGURE 44.3 - The Largest Highway 11 Towns (besides Davidson): Dundurn, Hanley, Kenaston, and Craik.



FIGURE 44.4 - The Only Other "Towns" within the Sector: Central Butte, Imperial and Elbow

Central Butte (372), Imperial (321) and Elbow (294)

Besides the previously mentioned six towns, Central Butte, Imperial and Elbow are the only other towns in the sector with a population greater than 125 people. This, combined with the fact that all three are relatively isolated from towns of similar size or larger, has led to them becoming shopping and service centers not only for surrounding rural communities, but for many surrounding smaller towns as well.

As such, all three towns currently maintain several grocery stores, hardware stores, and hotels, a public library, many churches, and substantial recreational facilities. In addition to this, both Central Butte and Imperial have K-12 schools as well as full health care facilities.

And although both Central Butte and Imperial have been experiencing a fairly significant rate of depopulation (both losing approximately 7.5 percent of their population every census period for the last twenty years), this is significantly less than smaller surrounding communities which have been closer to 10 percent. In contrast to this, because of its proximity to Lake Diefenbaker, Elbow has been supplementing its agricultural economy base with recreation and tourism - and as a result has managed to keep its depopulation at levels closer to 2 percent every five years.

Riverhurst (121), Simpson (118), Loreburn (113), Tugaske (105)

From peak populations of 301, 371, 300, and 328 respectively, Riverhurst, Simpson, Loreburn and Tugaske have each experienced quite severe decline over the last several decades, all four having lost approximately two thirds of their populations.

Nonetheless, all four towns still maintain basic services such as a general store and service center, a library and community center, as well as basic recreational facilities. In addition to this, Loreburn has been able to maintain a motel and restaurant as well as a K-12 school, while Tugaske has become home to many artists and craftspeople as of late: several musicians, an author, a potter, a sculptor and carver, a woodworker, and a luthier all currently live within the village.

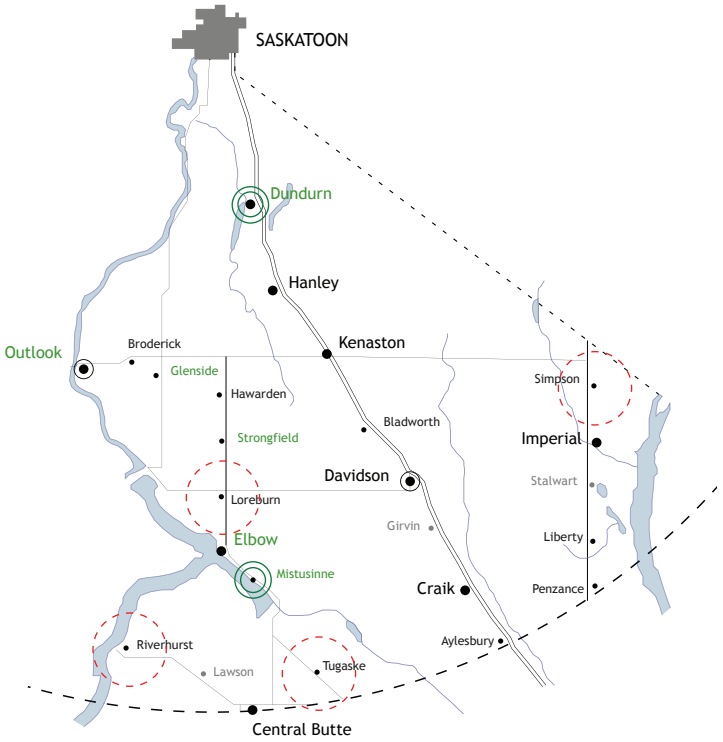


FIGURE 44.5 - The Four Largest "Villages" within the Sector: Riverhurst, Simpson, Loreburn and Tugaske

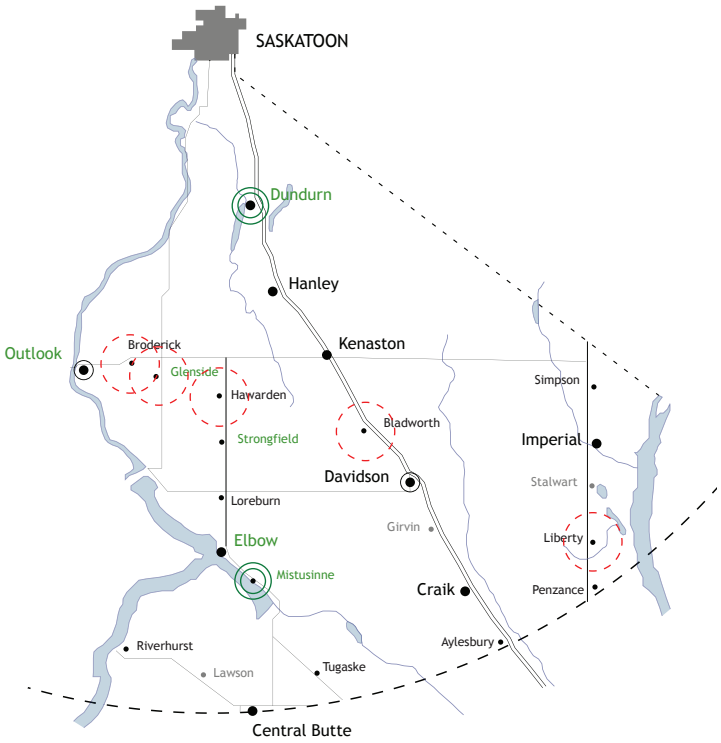


FIGURE 44.6 - Mid-sized "Villages" within the Sector: Glenside, Broderick, Hawarden, Liberty and Bladworth

Glenside (86), Broderick (77), Hawarden (75), Liberty (73), and Bladworth (70)

With populations near 75 people each, the towns of Glenside, Broderick, Hawarden, Liberty and Bladworth have, not unlike the last 4 towns investigated, lost a significant amount of population and services over the last few decades.

While Hawarden, Liberty and Bladworth have been able to retain some businesses and services - several hotels and coffee shops, community halls, skating rinks and ball diamonds, churches and co-op stores among them all; both Glenside and Broderick have currently lost all commercial ventures, with residents traveling to the nearby town of Outlook for employment, shopping and services, entertainment and recreation.

Mistusinne (56), Strongfield (47), Aylesbury (45), Penznce (30)

As the four smallest settlements within the sector, one would expect Mistusinne, Strongfield, Aylesbury and Penzance to be comprised solely of a few dozen residences scattered amongst empty lots and abandoned buildings. And while this is pretty much the case for Strongfield, Aylesbury and Penzance (Strongfield still has a cafe and several small businesses, Aylesbury a hotel, Penzance a church and community hall), an exception to this is Mistusinne.

Unlike the majority of towns in the province with origins dating back 100 years, Mistusinne began its life only 20 years ago with the advent of Lake Diefenbaker as a recreation area. Since then, Mistusinne has grown into a resort village with 245 privately-owned properties, a nine-hole golf course, a boat launch and miles of sandy beaches. And while the village's official population is only 56, this is only the number of permanent, year-round residents. During peak summer months, the population is in fact many times greater. However, with no commercial ventures besides the golf course on site, residents must travel to the nearby town of Elbow for all their goods and services.



FIGURE 44.7 - The Four Smallest Officially Recognized Settlements within the Sector: Mistusinne, Strongfield, Aylesbury and Penzance

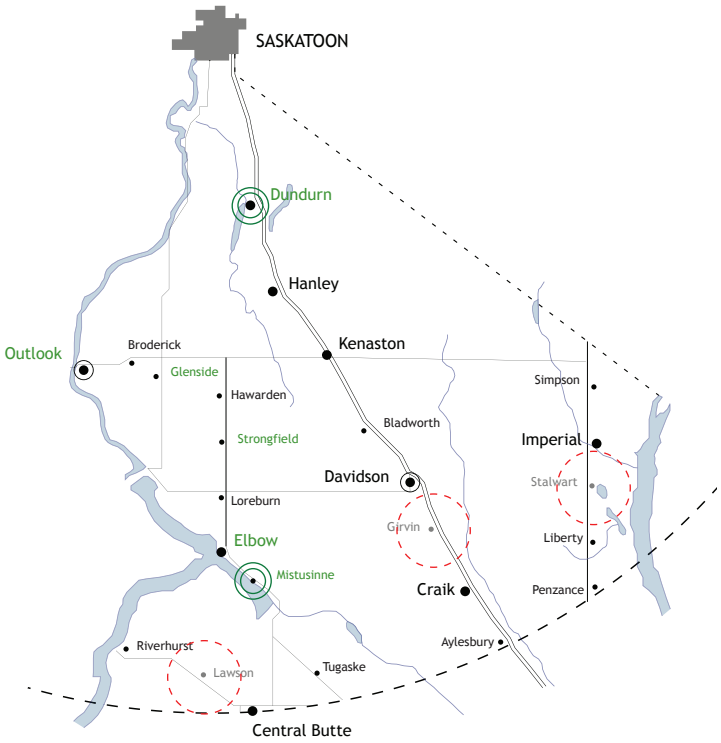


FIGURE 44.8 - Communities in the Sector with Populations of 25 or Less: Girvin, Stalwart, and Lawson

Girvin (25), Stalwart (20), and Lawson (not avail)

Also included within this sector are three communities that have lost enough population and services as to have their official standing as settlements revoked: Girvin, Stalwart, and Lawson. While information about Lawson is currently unavailable, both Girvin and Stalwart no longer have any services and institutions and are comprised solely of a few inhabited residences scattered among vacant lots and abandoned buildings.

4.3 Existing Initiatives Promoting Small-Scale Sustainable Agriculture

In Section 3.3, five "existing initiatives" promoting small-scale sustainable agriculture in the Rural South-East Sector are referred to. The following section briefly describes each of these and mentions the potential contribution of each to the development of a rural processing/support center around which a "rural node" could be developed.



Canada-Saskatchewan Irrigation Diversification Centre (CSIDC)

Established in 1949, the CSIDC has been promoting crop diversification and sustainable irrigation practices in the Outlook area for sixty years. With over 310 acres of test plots, greenhouses and demonstration facilities, it has become the heart of a diversified agricultural area: the district currently produces sunflowers, corn, potatoes, and other vegetables in addition to the region's traditional crops. As such, it seems possible that with the addition of small-scale fruit and vegetable processing, storage, and even distribution facilities, the center could provide the locus necessary to begin the region's development as a viable rural node - providing the infrastructure required to deliver both economic and social sustainability to a group of associated small-scale producers.



Grainland Community Pasture

With stated goals of promoting environmental as well as agricultural sustainability, the Grainland Community Pasture is one of hundreds of federally and provincially-run community pastures in the province. Protecting 15,000 acres of the sector's most vulnerable lands, while providing the opportunity for about 25 small-scale farmers to practice sustainable ranching; it follows that any town nearby could be an ideal location for the establishment of the permanent facilities associated with a mobile abattoir service. Combined with other processing and rural resource opportunities, such development could provide a real opportunity for the development of a rural resource/processing center around which a group of sustainable producers could begin to form.



FIGURE 44.9 - Current Initiatives promoting Small-scale Sustainable Agriculture within the Sector

Supporting sustainable agricultural research and demonstration at the grass-roots as well as government level, all four initiatives described here could be catalysts for the development of rural nodes either on location or in nearby towns.



The Taylor Family Farm

Hosting workshops, open houses, and farm tours every summer, the Taylor family's 3,000-acre certified organic grain farm becomes a meeting place and learning center for those wanting to make the transition from chemical to organic farming, every summer. Not surprisingly, there are many other organic grain farmers in the area, many of whom are interested in developing innovative ways of staying economically viable by adding value to their crops. As such, Kenaston could be an ideal town in which to begin the development of a rural node with small-scale grain cleaning, processing, seed saving and distribution facilities.



The Back to the Farm Research Farm (BFRF)

Established in 1973 by long time organic farmer Elmer Laird, the Back to the Farm Research Farm is a 640-acre organic grain farm, turned research and demonstration farm. Hosting crop trials and workshops as well as providing research support for anyone interested in organic farming, the BFRF already acts as a gathering place and resource center for those interested in agricultural sustainability in the area. The addition of seed saving facilities, a digital as well as hardcopy literature library, as well as small-scale grain milling and processing equipment could begin its growth as a vital rural node within the sector.

4.4 Enlargement and Legend of Craik's "Green Map"



Local Annual Events

Build, Bale and Sail (early July), 567-2242
Hemp Field Festival (late August), www.fieldfestival.ca
Solar Fair and Eco-Workshops – TBA, 567-2250

***The Craik Sustainable Living Project (CSLP)** is a nonprofit organization for sustainable development advancing the local use of more ecologically sound technologies and ways of living in rural Saskatchewan, Canada. The four key components of the project are the Eco-Centre, outreach and education programs, community action, and the ecovillage.

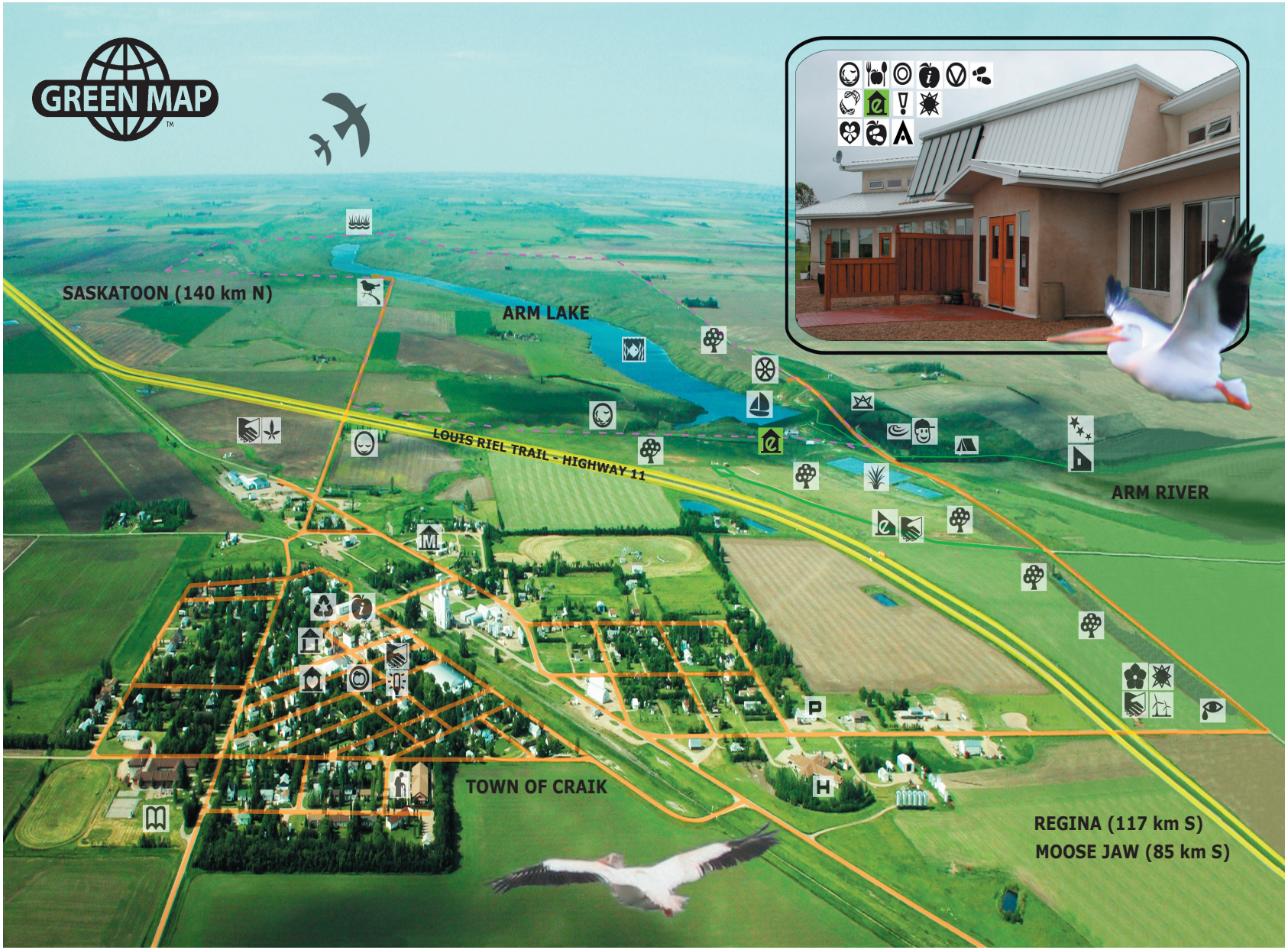


FIGURE 44.10 - Craik's "Green Map"

Appendix Five Urban Node-Making Elements, A Detailed Description

As discussed in Section 3.4, this thesis proposes that neighborhood farmers' markets be located not in isolation, but in near proximity to other public amenities such as parks, schools, churches, small-scale commercial facilities as well as higher density residential areas in order that they contribute to the building of strong neighbourhood "nodes".

Divided into four categories: "public parks", "social community infrastructure", "commercial areas", and "residential areas" the following section both maps the *occurrence of*, and discusses the *contribution of*, the previously mentioned public amenities (as well as the other major elements of the built fabric of the Urban South-East Sector), to the building of vital urban nodes appropriate for the development a neighborhood farmers' market.

5.1 Public Parks

Providing significant recreational as well as social amenity it is imagined that all three types of parks identified as existing within the South-East Sector have the ability to contribute to the building of strong neighborhood nodes. However, because it is imagined that such parks would not only *contribute to*, but provide the *locus for* the generation of said neighborhood nodes (by becoming the site of the proposed farmers' markets), "large-scale main neighborhood parks" have been identified as the type of park most ideally included within a network of neighborhood nodes throughout the Sector.

Large-scale Main Neighbourhood Parks

Due to: a) their typically central placement within the communities they serve; b) their ability to accommodate a market of the required size without compromising any of the existing uses of the park; c) their typically under-utilized nature; and d) their ability to physically connect multiple pieces of important community-based infrastructure together; "large-scale main neighborhood parks" have been identified as a key element in building strong neighborhood nodes throughout the Sector.

Smaller Neighbourhood Parks

Providing similar recreational amenities as "large-scale main neighborhood parks," but lacking the ability to both accommodate the scale of market ultimately required, as well as join multiple pieces of community infrastructure together, it is imagined that, "smaller neighborhood parks" remain undeveloped in the following scenario.

Riverside Parks

Similarly, located on the edge of any community, and seen as a city-wide rather than community-based amenity, it is imagined that - although contributing significantly to health of urban communities throughout the South-East Sector - "riverside parks" may not be ideal locations for the establishment of urban nodes featuring neighborhood farmers' markets either.



FIGURE 55.1 - Distribution of Public Parks within the Urban South-East Sector



FIGURE 55.1a - Rotary Park



FIGURE 55.1b - Meewasin Park

Heavily formalized with monuments, tennis courts, and formal gardens in some areas (Rotary Park) and heavily naturalized in others (Meewasin Park), Riverside Parks may not be ideal locations for the establishment of urban nodes.



FIGURE 55.1c - Greystone Park

Containing a baseball diamond, soccer field, a tobogganing hill, several playground areas, and extensive walking paths, the nearly 11-acre Greystone Park is key piece of community infrastructure which, this thesis argues could both accommodate and be enhanced by the addition of a neighbourhood farmers' market.



FIGURE 55.1d - Wiggins Park

Covering 3 acres and containing a soccer field, a playground, and toboggan hill, "smaller neighbourhood parks" such as Wiggins Park feature similar amenities to "large-scale parks," however unable to accommodate the scale of market required, it makes sense to leave these parks as open spaces given the proposal to intensify the larger ones.

5.2 Social Community Infrastructure

In addition to public parks, it is imagined that community-based institutions such as schools, churches, and public service organizations, could also contribute significantly to the creation or strengthening of neighbourhood nodes within the South-East Sector by being generators of “community” for the typically local residents which they serve.

Educational Facilities

Distributed relatively evenly throughout the sector, and typically located within easy walking distance of the communities they serve, educational facilities (public elementary especially) hold great potential in contributing to the strength of any neighbourhood node by providing a platform not only for school children of the immediately surrounding neighborhood, but adults as well, to connect with each other - establishing relationships and generating a sense of “community” among members of the surrounding area.

Religious Centers

The cultural importance of religion in the lives of many make churches, mosques, temples, etc., potential contributors to the vitality of nodes as well. And although members of such organizations do not necessarily live within the immediately surrounding neighbourhood, the strong ties to such organizations often produce a group of people not only committed to the religion, but also to each other and the neighbourhood in which that institution belongs.

Other Community Support Organizations

For community members without an immediate connection to either a local school or religious institution, other community support organizations such as public service groups, arenas or even libraries may provide just as strong a community gathering place, generating relationships between residents, and contributing significantly to the building strong urban nodes throughout the sector.



FIGURE 55.2 - Distribution of "Social Community Infrastructure" within the Urban South-East Sector



FIGURE 55.3a - Nutana Collegiate
Acting as the hub of community life for children and parents alike, Nutana Collegiate holds great potential in becoming a significant contributor to the development of a neighbourhood node in the area.



FIGURE 55.3b - St. James Anglican Church and Spirit Centre
The strong ties of many to the St. James Anglican Church its associated Refinery Arts and Spirit Centre has produced a group of people not only committed to the institution, but also to each other and to the neighbourhood in which that institution belongs.



FIGURE 55.3c - Adelle House
Providing shelter and support for battered women and their children, Adelle House act as a strong generator of "community" not only for those it serves, but also for the surrounding community, providing counselling services and extensive outreach facilities.

5.3 Commercial Areas

Although massive parking lots and considerable consumer traffic have resulted in the use of “big box strips and shopping malls” as locations for temporary farmers’ markets throughout the South-East Sector (and the rest of the city as well), such areas hold little opportunity to become part of neighbourhood nodes suitable for locating such markets in the proposed scenario.

Big Box Strips and Shopping Malls

Focused on serving the automobile-driving consumer, vast distances between shops, huge traffic arteries and global retail chains not only makes “big box strips” such as 8th Street East inhospitable to walking shoppers, but with very little direct economic or physical connection to the surrounding neighbourhood both “big box strips” as well as “shopping malls” provide very little in terms of providing the amenity required to build strong neighborhood nodes.

Mixed-use Retail Zones

“Mixed-use retail zones” on the other hand, hold significant opportunity. Typically organized around a pedestrian-oriented street with one or two stories of residential units above - an extremely vibrant community-based space is able to be created. Cafes, restaurants, and bakeries that spill out onto the street, iconic heritage buildings that resonate with the population, as well as independent movie theatres that host film festivals and the like, are all common in such zones and contribute to the building of such areas as rich neighbourhood nodes.

Neighbourhood Commercial Nodes

Although typically in the form of strip malls or other uninspiring urban forms, “neighbourhood commercial nodes” typically cater to a reasonably local population and in many cases act as community gathering places for teens of the area - creating the opportunity for these areas to contribute to the creation of vital neighborhood nodes as well.



FIGURE 55.3 - Distribution of Commercial Areas within the Urban South-East Sector



FIGURE 55.3a - Broadway Avenue
Lined with independently owned boutiques, cafes and specialty stores, Broadway Avenue is a "mixed-use retail zone" rich in history and a sense of community - a significant contribution to the establishment of strong urban nodes.



FIGURE 55.3b - 8th Street East
Home to global chains, large traffic arteries and massive parking lots, big box strips such as 8th Street East are not conducive to the establishment of neighbourhood nodes in the proposed scenario.



FIGURE 55.3c - Avalon Shopping Center
Featuring a grocery store, a video rental store, a garage, a laundromat, and a variety of ethnic restaurants the Avalon Shopping Centre caters to a relatively local population, and therefore has some ability to contribute to the creation of strong urban nodes.

5.4 Residential Areas

Bringing not only a greater concentration of *people* to an area but also a greater concentration of *built fabric* to an area, it is imagined that any kind of residential density greater than single family detached housing will be beneficial when trying to develop/identify neighbourhood nodes appropriate for the development of a farmers' market within the South-East Sector.

Medium Density Residential

While the vast majority of residential fabric in the area has been classified as "low density residential" (all detached homes as well as duplex's and townhouses have been included in this section), many major transportation arteries such as 8th Street E. and Clarence Ave, are bordered by a significant number of low-rise apartment buildings (medium density), which, by increasing population and well as built density could contribute to the building of strong urban nodes.

Low-income Medium Density Residential

Two "low-income medium density residential areas" are also located within the Sector. Contributing increased densities as well as a heightened sense of community that typically exists within such areas, it is imagined that the housing developments of both Edmund Heights and Gladmer Park could also contribute significantly to the establishment of strong neighbourhood nodes within the South-East Sector.

High Density Residential

Contributing the greatest number of people to any given area, a dozen high density residential units (6 or more stories) also increase the densities of their immediately surrounding areas, again a significant asset in attempting to create community nodes within in the sector.



FIGURE 55.4 - Distribution of Residential Areas within the Urban South-East Sector

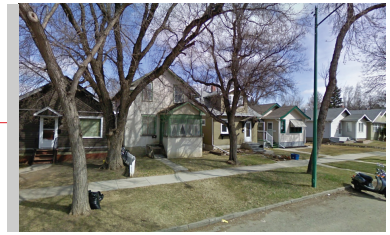


FIGURE 55.4a - 4th Street E. between Melrose and Victoria Ave.

Contributing the fewest number of people per acre, low-density residential areas such as that found on 4th Street E. contribute the least to the creation of vital neighbourhood node.



FIGURE 55.4b - 8th Street E. between Dufferin and Broadway



FIGURE 55.4c - Edmund Heights Housing Development

Contributing not only more people per acre, but in some cases a heightened sense of community as well, medium-density areas such as the low-rise apartment buildings on 8th Street East as well as the housing development of Edmund Heights could contribute significantly to the establishment of vital neighbourhood nodes.



FIGURE 55.4d - Scott/Forget Towers at Mceown Ave. and Louise St.

Similarly to medium density areas, high rise towers such as the "Scott" and "Forget" Towers on the corner of Mceown Ave. and Louise St. could also contribute significantly to the creation of vital neighbourhood nodes.