Township of Langley

Est. 1873

Township of Langley Agricultural Profile

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(with 2010 Land Use Inventory information provided by BC Ministry of Agriculture)

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1. Executive Summary

The Township of Langley is one of the richest agricultural areas in Canada. With natural capital such as high quality soils and ideal climate for farming, agriculture in Langley will continue to be part of the community and regional economy for the foreseeable future.

The Agricultural Profile is a summary of the key farm sectors of the community. It provides background information for the development of an Agricultural Viability Strategy (AVS). The purpose of the AVS is to enhance the viability and sustainability of agriculture by addressing farm viability issues, including potential for local food production, diversification opportunities, economic challenges, urbanization conflicts, environmental issues and competition for agricultural land.

Agriculture in Langley is characterized by a diversity of crops and livestock operations. It is a $257 million industry, with a total farm capital of $1.9 billion in 2006. Key indicators of the agricultural industry include:

- Area in production: 12,970 hectares (32,048 acres)
- Number of farms in the Township of Langley: 1,292
- Average farm size: 10 hectares (24.8 acres)
- Total farm capital: $1,919,266,478
- Annual gross farm receipts: $257,276,651
- Annual cash wages paid: $47,673,547
- Total paid labour: 89,527 weeks, or 1,791 full-time equivalent jobs

(Sources: Census of Agriculture, 2006; BC Ministry of Agriculture (AGRI), 2007)

Langley generates the third highest gross farm receipts in BC. Its farms produce high revenue products. Table 1 presents gross revenue per hectare for the main agricultural sectors.

Table 1. Gross Revenue per Hectare by Sector

Sector/commodity	Total revenue ($)	Total area in hectares	Revenue per hectare ($)
Greenhouse operations	56,992,164	240	237,467
Mushroom farms	21,675,816	135	160,562
Poultry and eggs	33,838,959	486	69,627
Field vegetables/flowers	15,209,131	220	69,132
Berry and vine crops	23,616,336	1374	17,188
Housed livestock (inc. horses)	63,026,085	4,027	15,651
Miscellaneous agriculture	942,469	162	5,818
Extensive (outside) livestock	38,333,475	7,147	5,364
Nursery or trees	1,175,194	1,043	1,127
Forage and pasture	2,467,022	3,451	715

(Sources: Census of Agriculture, 2006; BC Ministry of Agriculture, 2007)

Non-soil based agricultural uses (such as greenhouse operations and mushroom farms) contributed significantly to revenue generation. It is anticipated that total revenue from non-soil based agriculture will continue to increase as healthy profit margins attract additional investment in the future.

There are new and emerging opportunities related to agri-tourism, direct marketing, organic and niche market production as well as those linked to greenhouse gas reduction. In addition, value-added processing is a vital sector creating substantial local employment and income opportunities through Langley's agri-food industry to consumers in Metro Vancouver. The potential for expanding agriculture into new exciting areas as well as supporting existing forms of food and fibre production will enable Langley to be the benchmark for what is possible through sustaining a resilient farm sector.

The soils in Langley are highly suitable for agriculture. With improved irrigation or drainage, 75% of all ALR lands would be capable of achieving Class 1 to 3 type soils, which are considered the top classes for agricultural capability. Access to water for irrigation and effective implementation of drainage are two major issues with regards to sustainable farming in the Township. Policies may be needed to ensure that available water is used efficiently, and in accordance with the overall direction of the community.

The majority of farms are less than 4 hectares (10 acres) in size. While there are fewer opportunities to develop viable farm operations on small lots, developing opportunities for small lots will have to be a priority moving forward in encouraging sustainable farm activity.

With more horses than any other municipality in the province, Langley is the Horse Capital of B.C. The horse industry is one of the highest profile and largest agricultural activities in the municipality. It produces horses that perform at world-class levels.

The rural-urban boundary of the Township of Langley is dominated by pasture and extensive (outside) livestock agricultural operations, while more intensive operations seem to be located away from the edge. These types of operations may be trying to avoid conflicts often associated with operating next to residential areas.

Langley farms produce a significant portion of the region's food supply. The climate, resources and proximity to Vancouver are very positive factors for the long term health of agriculture in the Township. The strength and resilience of the Langley agricultural industry will not only contribute to regional food security by producing more food that is bought and eaten locally, but also continue to be a major economic driver for the region.

Agriculture in Langley operates in a dynamic array of social, environmental and economic challenges and opportunities. The Agricultural Profile should be used as a foundation to develop the Agricultural Viability Strategy to enhance the viability and sustainability of farming and ensure positive outcomes for the Township of Langley as a whole.

2. Introduction

The Township of Langley, located in Metro Vancouver (formerly the Greater Vancouver Regional District, or GVRD), is currently developing an Agricultural Viability Strategy (AVS). The purpose of the strategy is to enhance the viability and sustainability of the agricultural sector in the Township of Langley by addressing farm viability issues including potential for local food production, diversification opportunities, economic challenges, urbanization conflicts, environmental issues and competition for agricultural land.

As the first phase of the strategy development process, this report will provide the Township with a unique agricultural database by which the Township, the farming community, and the general public can better:

- understand farmers, and farming in the ALR;
- identify opportunities, issues, and constraints to farming;
- support ongoing agricultural policy and statistical research; and
- prepare an effective Agricultural Viability Strategy.

This report is primarily concerned with a description and analysis of the information contained within the database. The intent is to show the diversity of agricultural uses, their trends and futures as well as opportunities and constraints.

The outcome of this report is to provide a comprehensive situational analysis of agriculture in the Township. This document provides a detailed background and context on agriculture. The information is from numerous sources including the provincial, regional and local governments; selected interviews with farmers; document research; policy analysis; census data; and field observations. Significant effort has been made to present the information in a manner that will be highly useful in the next phases of the project.

The following data sources were used extensively in the production of this report:

- **2001, 2007 and 2010 BC Ministry of Agriculture (AGRI) land use inventories for the Township of Langley**
  The land use inventories cover in detail: land use, agricultural use, agricultural scale, irrigation scale and practice, livestock scale and type, as well as changes in land use between the two time frames (This version of the Profile was updated using information collected as part of the 2010 Land Use Inventory, while the previous version was based on information collected in 2001 and 2007).
- **Census of Agriculture years 1991-2006**
  The Census of Agriculture is a complete dataset covering all aspects of farms and farming including: farm classification, land use, tenure, crop and livestock statistics, farm business statistics, and farm operator statistics;
- **BC assessment information: 2009**
  The BC assessment information produced by the BC Assessment Authority contains information pertaining to: land use, land value, value of land improvements, and parcel sizes;
- **Canada Lands Inventory soils mapping**
  Canada Lands Inventory soils mapping contains information pertaining to all aspects of soils within the ALR including: soil capability class and subclass; and

- **Township of Langley GIS datasets**
  The Township served as a source of data and provided datasets pertaining to municipal boundaries, ALR boundaries, roads and road classification, ditches, aquifers, wells, dykes, environmentally sensitive areas, slope, aspect, and elevation.

The following areas are explored and analyzed in detail in the context of opportunities and constraints to farming:

- history of farming in the Township,
- the ALR and its importance to the Township,
- land and agricultural uses within the ALR,
- biophysical characteristics,
- human modifications to the ALR,
- agricultural production,
- farms and farmers,
- farm economics, and
- commodity profiles.

3. History of Farming in the Township

Human occupation of the area now known as Langley dates back at least to the retreat of the last glaciers some 10,000 years ago. The ancestors of the First Nations People, now known as the Stó:lo, have been the principal occupants of the Fraser Valley throughout the last several millennia. The Stó:lo culture was based on the wealth of the river and the forest. Salmon, sturgeon, and other fish were plentiful in the past. These, and wild berries and tubers, formed the basis of the Stó:lo diet.

The area's river location, its proximity to the sea, and its untapped fur resources drew the Hudson's Bay Company to establish its post in Langley in 1827. The Company's first fort was established on the Fraser River 3.2 kilometres (2 miles) downstream from what is now Fort Langley. The fort's eventual purposes were to supply the Company's northern coastal and interior posts with trade goods, equipment, and locally grown or harvested foodstuffs; and to receive furs and salmon for shipment to the Company's overseas markets.

The Company established a farm on a fertile plain inland, near the site of modern-day Milner. The farm's produce served the Company's own needs and accompanied the fort's preserved salmon to Hawaii and other Pacific Rim markets.

Recognition that the site of the fort was vulnerable to flooding and too far from its farm resulted in its 1839 relocation further upstream on a higher piece of land at the site of the current reconstructed fort.

In 1858 gold was discovered on the bars of the Fraser River drawing thousands of eager prospectors into the area. Fears that American influence might lead to annexation caused the Company's former Chief Factor and Governor of Vancouver Island, James Douglas, to assert British claims over the territory. British Columbia was subsequently proclaimed a Crown Colony in a ceremony in the Big House at Fort Langley on November 19, 1858.

Competition from newly arrived farmers and merchants led to the sale of the Company's farm by auction beginning in 1878.

Settlers began to arrive from Europe and eastern North America as the agricultural potential of the lower Fraser Valley began to be better understood. Initial settlement tended to be near the river (the area's only transportation route), on natural prairie lands. Later settlers were faced with the back-breaking task of clearing the forest lands that lay inland, on higher and generally less fertile ground.

For those who could not acquire naturally cleared land, the task of establishing a foothold was immense. Massive cedars and firs and thick undergrowth covered much of Langley. In the absence of appropriate transportation routes, the forest cover was worthless to early settlers and was often felled and burned or simply burned where it stood. Stumps were left to be ploughed around or removed with stumping powder. Prosperity was often slow to come to farmers on the uplands, and their homes and outbuildings were often small in comparison with those of their more fortunate neighbours.

With increased settlement in the area, twenty-nine land owners petitioned the newly elected legislature of the Province of British Columbia to request incorporation. The petition prompted the legislature to pass the Municipality Act in 1872. Langley and Chilliwack were the first two rural districts to incorporate on April 26, 1873.

As settlement moved inland from the river and away from Fort Langley, other village centres began to emerge. These typically developed at major cross roads, and ultimately featured a church, a general store, a hotel, a post office, and a blacksmith. Murray's Corners (later called Murrayville) was the earliest of these, having begun near Paul Murray's farm (pre-empted in 1874) where the New Westminster-Yale Road intersected with the trail to Fort Langley.

Current development in the Township consists of a number of urban centres (Aldergrove , Brookswood/Fernridge, Fort Langley, Murrayville, Walnut Grove and Willoughby) located within a rural landscape. Some of the urban areas are sites of early settlement in the municipality, while others are recently developed urban areas. The rural area, which covers about three-quarters of the Township, provides a diverse landscape ranging from farm fields to treed slopes, with watercourses, old farmsteads and views of rural scenery and landmark mountains.

Population in the Township has grown rapidly, from 21,936 in 1971 to 104,000 in 2010. It is expected that the Greater Vancouver area will continue to experience strong pressures for growth and Langley, with its relatively large inventories of developable land, will continue to grow. With this growth, it is expected that the form of development may change over time, with increasing demand for multi-family development. There will also be continued pressure on conversion of agricultural land for urban purposes.

4. Policy Framework

Several agencies, legislations, regulations and policies affect how agriculture is carried out within communities and with other stakeholders in British Columbia. A variety of initiatives are implemented at national, provincial and local levels. Below are descriptions of the key initiatives affecting agriculture in the Township of Langley.

4.1. National Context

Canadian agriculture has been shifting and adapting to changes in response to factors such as free trade negotiations, impacts of globalization on the food system, increased access to domestic food markets, animal disease outbreaks, and health and food safety concerns. Recently, additional concerns have emerged about food security, climate change, and food self-sufficiency.

There are two significant federal agencies developing policy and programs that affect farmers throughout the country. Agriculture and Agri-food Canada (AAFC) provides information, research and technology, and policies and programs to achieve security of the food system, health of the environment and innovation for growth. The Canadian Food Inspection Agency (CFIA) is dedicated to safeguarding food, animals, and plants, to enhance the health and well-being of Canada's people, environment, and economy. The CFIA develops policy and regulation related to plant and animal diseases, the safety of the food supply including import and export of food products, packaging and labelling regulations, feed and fertilizer regulations, meat inspection, upgrading and, more recently certification of organic products on a national scale.

4.2. Provincial Context

In BC, many policies, regulations and programs affect how agriculture interacts within communities and with other stakeholders.

Provincial Legislation and Land Use Policy
A number of changes have been made to provincial land use policy since 1986. These are described below. The Strengthening Farming initiative was undertaken, over the same period, to increase awareness of these changes and to assist local governments in incorporating these "right to farm" provisions into local policies and bylaws. The degree to which these policies and bylaws have been incorporated in the Township of Langley varies because some of these have not been reviewed or updated during that time.

The Strengthening Farming initiative lists 59 Provincial Acts that affect agriculture. Summaries of some of the most relevant legislation are provided below.

Agricultural Land Commission Act
The Agricultural Land Commission Act provides the legislative framework for the preservation of BC's agricultural land. The legislation provides for the establishment of the provincial Agricultural Land Commission and outlines its objectives, powers, processes, use of land within the ALR, and the relationships with local governments. The act takes precedence over most other provincial legislation and local government bylaws. The purposes of the Agricultural Land Commission are:

1) to preserve agricultural land;
2) to encourage farming on agricultural land in collaboration with other communities of interest;
3) to encourage local governments, First Nations, the government and its agents to enable and accommodate farm use of agricultural land and uses compatible with agriculture in their plans, bylaws and policies.

Accordingly, the Agricultural Land Commission plays a very significant role in the establishment of land use policy and in the land use decision-making at the local government level.

The Agricultural Land Commission Act designates soil removal and fill placement as nonfarm uses requiring an application to the land commission under section 20. Soil removal and fill placement have proven to be concerns in the areas of Langley.

Agricultural Land Reserve (ALR)
The Agricultural Land Reserve is a provincial zone in which agriculture is recognized as the priority use. The ALR was established in 1973, by way of the BC Land Commission Act. Approximately 74% (23,423 ha) of the Township of Langley's land base is within the ALR. It accounts for 38.2% of the Agricultural Land Reserve within Metro Vancouver.

Agricultural Land Reserve Use, Subdivision and Procedure Regulations
On November 1, 2002, the new Agricultural Land Commission Act and the Agricultural Land Reserve Use, Subdivision and Procedure Regulations were brought into force. The regulations essentially describe acceptable "farm uses of agricultural land" in the province. These activities are permitted on ALR lands and may not be prohibited by local government bylaw except a "farm bylaw" prepared under Section 917 of the Local Government Act. These activities include:

- farm product processing - storage, packing, product preparation and processing of farm products;
- farm retail sales;
- wineries and cideries;
- additional residences necessary for farm use; and
- construction of farm buildings.

Edge Planning – Edge Planning Areas, Development Permits & Covenants
Land use compatibility issues are often focused along urban/agricultural edges. Historically, little attention has been paid to developing policies that enhance land use compatibility and ensure the security of agriculture at the interface. The Strengthening Farming legislative package was enacted, and specific components were designed to enhance local government's ability to undertake edge planning along agriculture's interface. Based on the principle of "shared responsibility," there are tools for both the urban side and the agriculture side. Local governments, the BC Ministry of Agriculture (AGRI), and the farming community are increasingly referring to the 600 metres on either side of the farmland/non-farmland boundary as edge planning areas. Edge planning areas (EPAs) require a partnership of local and senior governments, the agricultural community, and other sectors to ensure the continuation of farming adjacent to urban uses.

To protect agricultural land, and to prevent conflict between farming and urban uses, EPAs require a variety of land use and farm practices approaches. These include:

- establishment of buffers on urban land. This could include a landscaped buffer on the urban side and considerations for the siting and orientation of buildings. This can be carried through and detailed in a development permit, a zoning bylaw, a subdivision and development control bylaw, an official community plan (OCP), and any related covenants;
- zoning bylaws that direct the siting of farm uses, farm buildings and farm structures that may cause conflicts, e.g., ones associated with significant noise, dust and odour;
- for local government designated by the Provincial government, farm bylaws that establish farm management standards for practices such as manure storage and handling, and activities that create significant noise, dust and odour; and
- efforts to improve relations and communications between the urban and farming communities.

Development permits areas (DPAs) are one of the strongest tools for shaping new development to ensure that it respects adjacent farmland and farming practices. DPAs allow local governments to create site-specific requirements for development over and above basic zoning. A municipality may designate a DPA in which new development will be required to conform to development permit guidelines. A permit must be obtained before a private landowner may subdivide, alter land, or construct or alter a building in a DPA, and development must be in accordance with the terms of the permit.

Local governments may designate an area as a DPA for a range of purposes, including the protection of farming. When a DPA is established, the local government must describe the special site conditions or objectives that justify the designation, and specify guidelines to achieve those objectives. When an owner applies to the local government for a development permit to alter a site within a DPA, the guidelines in the OCP or zoning bylaw will direct what conditions, if any, staff and council place on the new development. DPA guidelines designated to protect farming may include land requirements that result in buffering or separation of development from farming on adjoining or reasonably adjacent land. This includes:

- screening;
- landscaping;
- fencing;
- setback of buildings from agricultural land;
- open space uses adjacent to farming;
- sensitive handling of walkways and trails in buffer strips;
- specifying water retention capacity and limits on total impervious surfaces to prevent flooding of agricultural land by suburban development;
- prohibiting road endings adjacent to farmland; and
- minimizing pedestrian and vehicle traffic near the ALR.

Many local governments have incorporated the Agricultural Land Commission's Landscaped Buffer Specifications into DPA guidelines.

Covenants

Under section 219 of the Land Title Act, a municipality or regional district may register a covenant on the title to land to protect specific characteristics of land in or adjacent to the ALR. A covenant is a voluntary agreement between the landowner (often a farmer or a developer) and a covenant holder (a municipality, regional district, or non-profit organization). The landowner agrees to protect the land as outlined in the wording of the covenant. The covenant holder has the right to monitor and enforce the covenant to make sure the landowner is using the land in accordance with the covenant.

Registering the covenant on the title of the land ensures that the covenant applies to future owners and endures indefinitely. For example, a covenant on the parcels of residential land adjacent to ALR land can outline buffer specifications like large backyards remaining free from development and landscaping requirements such as a hedge of trees or shrubs near the edge of the property. Covenants "run with the land," meaning they apply to whoever owns the land, thus ensuring that urban-agriculture edge mitigation measures endure over the long term. Covenants may contain provisions specifying:

- the use of land (including that it be used for agricultural purposes), or the use of a building on or to be erected on land;
- that land is to be built on in accordance with the covenant or is not to be built on;
- that land is not to be subdivided except in accordance with the covenant or is not to be subdivided;
- that parcels of land designated in the covenant are not to be sold or otherwise transferred separately; or
- that land, or a specified feature, be protected, maintained, enhanced, or restored in accordance with the covenant. For example, covenants can require that a wetland be maintained as a buffer between agricultural land and an urban residential area.

Covenants are often secured on land that is being subdivided adjacent to farmland to ensure that future activities and development of that land does not hinder the productive ability of the land in the ALR. Covenants also provide notice to potential buyers that the land is adjacent to farmland, which helps prevent future conflict about farming practices.

Farm Practices Protection Act

The Farm Practices Protection (Right to Farm) Act (FPPA) was passed in BC in April 1996. The intent of the act was to protect farms, using "normal farm practices," from unwarranted nuisance complaints involving dust, odour, noise and other disturbances. The Farm Practices Board, now called the Farm Industry Review Board, was established to deal with complaints that arise from the Act – to determine whether the disturbance results from normal farm practices.

Land Title Act

The Land Title Act gives approving officers the power to assess impacts of new subdivisions on farmland. The approving officer may require buffering of farmland from the subdivision and/or the removal of unnecessary roads to reduce the impact of subdivision on adjacent farmlands.

Local Government Act

The Local Government Act provides the legislative framework for local governments. There are provisions in the Act that address agriculture including community planning, zoning, nuisance regulations, the removal and deposit of soil, weed and pest control and water use and drainage.

Publications are available to assist local government in addressing these issues within their local policies and bylaws.

Provincial Farm Classification – BC Assessment

The Assessment Act, administered by BC Assessment, provides for preferred property taxation on lands that qualify as farmland. BC Regulation 411/95 (Standards for the Classification of Land as a Farm) of the Assessment Act defines a farm as all or part of a parcel of land used for:

a) primary agricultural production;
b) a farmer's dwelling; or
c) the training and boarding of horses when operated in conjunction with horse rearing.

All farm structures including the farmer's dwelling will be classified as residential.

There are minimum income requirements to qualify for farm classification as follows:

a) $10,000 on land less than 8000 m^2 (2 acres);
b) $2,500 on land between 8,000 m^2 (2 acres) and 4 hectares (10 acres); and
c) On land larger than four hectares (10 acres), $2,500 plus 5% of the actual value of any farm land in excess of four hectares.

Land rented to a "bona fide" farmer may also qualify if there is a written lease in place. Landowners must submit an application for Farm Classification to BC Assessment. Full details on farmland classification in BC are available at the BC Assessment website: bcassessment.bc.ca.

For the 2009 assessment roll, there were 2018 properties fully or partially in farm class within the Township of Langley.

Note: lower farm numbers are expected in Provincial Farm Classification because the minimum income threshold is $2500 per year. The Federal Census has no minimum income for reporting as a farm. In December 2007, the Minister of Small Business and Revenue committed to a review of the farm assessment process. The review is to ensure that the assessment system is fair, equitable and supports farming in BC with clear, simple and straightforward regulations and policies. Between September and November 2008, the Farm Assessment Review Panel consulted with people throughout BC to gather input for this process. The panel has recently submitted its report to the Province. The recommendations will be considered for implementation in the 2010 assessment roll. The results of this review could affect this planning process.

Natural Products Marketing (BC) Act - Supply Management

The Natural Products Marketing (BC) Act is the enabling legislation for various marketing boards and commissions in BC. It provides a system that allows individual commodities to promote, control, and regulate production, transportation, packing, storage, and marketing of natural products in the province.

In the Township of Langley, producers of the following products are affected by the regulations and policies that have evolved from this Act: dairy, chicken, eggs, turkeys, cranberries, mushrooms, and greenhouse vegetables.

Meat Inspection Regulation – Food Safety Act

In September 2004, the Province of BC enacted a new Meat Inspection Regulation under the Food Safety Act. All BC abattoirs that produce meat for human consumption must be licensed either provincially or federally. Only meat from livestock slaughtered in a licensed abattoir can be sold for food. The regulation allowed a two-year transition period to give abattoir operators, livestock farmers, and other stakeholders time to adapt.

Prior to enactment of this regulation, abattoirs in designated "Meat Inspection Areas" in BC had to be licensed (except farmers slaughtering their own animals on their own farm). Outside of the meat inspection areas, abattoirs had the choice of being either licensed or approved by the Regional Health Authorities. Only animals slaughtered in licensed facilities were inspected.

Environmental Farm Plans

A number of Provincial and Federal environmental regulations and policies affect agriculture. The Canada – BC Environmental Farm Plan (EFP) Program, launched in 2003, provides a process for individual farmers to evaluate how their operation impacts the environment and plan changes that will enhance their environmental stewardship. Developing an EFP will help to ensure that farmers are aware of the relevant environmental policies and regulations.

The plan covers environmental issues and concerns related to farm waste, fertilizers, fuel, wood waste, composting, energy use, on farm processing, livestock areas (indoors and out), manure handling, mortality disposal, crop production, pest management, buffers, riparian areas, soil management, water quality and quantity, drainage, irrigation, runoff/leachate, air quality including gas emissions, dust and particulate, odours, burning, and biodiversity among others.

Greenhouse Gas Reduction

The Government of British Columbia has recently introduced and enacted a number of significant pieces of climate action legislation that frame BC's approach to reducing greenhouse gas emissions (GHG)and preparing the province for the emerging low-carbon economy. Emissions of GHG are generated throughout the entire food and agricultural supply and distribution system from the production of agricultural inputs through to the final consumption of food products. Policy approaches that include agriculture in the abatement of GHG emissions and in GHG mitigation can take several forms.

In BC, these include the Carbon Tax Act which puts a price on greenhouse gas emissions, providing an incentive for sustainable programs to reduce emissions. The potential impacts on agriculture include potential increase in the cost of sectors that use fossil fuel energy sources and a related decrease in demand as a result of higher cost being passed on to producers. The net result could be lower profitability for those sectors. If the tax revenue is distributed in such a way that it promotes the consumption of low-carbon products, or directly promotes conservation or reductions in carbon usage, then the effects of the tax may be directed in a more positive manner. From this perspective, expenditure on the development and adoption of new low carbon technologies or a shift in consumption from traditional to "green" products could moderate the impact of carbon taxes on agriculture.

The Greenhouse Gas Reduction (Cap and Trade) Act establishes or authorizes hard caps on greenhouse gas emissions and sets the stage for market-based cap and trade programs to reduce greenhouse gas emissions in the province. Establishing emission limits rather than influencing behaviour through taxes could provide farmers more benefits from the addition of an asset (the emission permit) that has a

market value. If they are able to reduce their emissions below their allowable limit, then the sale of unused permits yields additional income. However, emissions from industries supplying agriculture with inputs (energy, chemicals, machinery) might be constrained through Carbon Tax schemes and the cost of these inputs could rise.

These and other carbon related regulations will pressure local governments to set targets for reduction and develop programs and policies that allow those targets to be achieved.

Health and Food Safety Framework

Food safety and food self-sufficiency have become much higher priorities for consumers and governments in the past two or three years. This shift has resulted from a number of food safety problems that have arisen within the mainstream food production and distribution systems. These concerns range from "Mad Cow" disease to melamine in dog food to food shortages and fears about the practices and products of large-scale agribusiness. Many consumers want to buy food close to home, from people they trust.

Food Safety and Food Security

The Growing Forward policy partnership between the federal and provincial government has developed two food safety management programs to reduce food safety risks within the agri-food system:

- **Food Safety Systems Implementation (FSSI) Program,** a financial incentive driven program to encourage and support BC producers/growers and non-federally registered processors to implement food safety management systems in their operations; and
- **Enterprise Infrastructure Traceability Program,** a program to assist primary and secondary operations in BC's agri-food sector to purchase and install traceability infrastructure/systems in their operations to demonstrate movement of information of their products from receiving to shipping.

4.3. Local Context

Rural Plan

The Langley Rural Plan (1993) was designed to be more responsive to agricultural issues. The Plan's foundations include the process followed to complete the plan, the decision to focus a major land use planning exercise exclusively on the rural, mostly agricultural, area and the commitment of Langley Council, staff, participants, and public. The result was to build a rural land use vision that pro-actively supports the agricultural sector. The Township is reviewing the Rural Plan with the PALC to harmonize land use planning approaches between the two jurisdictions.

Agricultural Advisory Committee

The Agricultural Advisory Committee (AAC) is a Council-appointed body whose purpose is to establish and maintain communication between the rural/agricultural community and Township Council regarding rural issues. The Committee was established in 2000 and consists of 14 voting members.

Urban Area Plans

The Township has adopted numerous community and neighbourhood plans for urban areas that border the ALR. While general interface policy has been addressed in the Rural Plan, each urban area results in increased residential pressures on adjacent agricultural lands. As well, local area infrastructure planning, especially concerning roads and water management, can have a significant impact on

surrounding agricultural lands. The Township of Langley is working with the BC Ministry of Agriculture (AGRI) to develop edge planning guidelines.

Economic Development Strategy

The Township of Langley Economic Development Strategy devotes a section to supporting agriculture. Specifically, there is a goal to support sustainable economic development that strengthens the agricultural economy and preserves the rural character. Several broad objectives have been adopted to achieve this goal:

- implement the economic development initiatives in the Rural Plan;
- promote the significance of the agricultural economy;
- promote agri-tourism;
- investigate the establishment of an agri-industrial park; and
- support new and existing agricultural business.

In addition, there is a goal to strengthen Langley as the Horse Capital of BC. This will be achieved by the implementation of the Horse Industry Strategy.

Water Management Plan

In 2009, the Township adopted a Water Management Plan, the first of its kind under the BC Living Water Smart program. The primary objective of the Water Management Plan is to ensure safe and sustainable groundwater for the community for generations to come. Implementing the plan would prepare the community for the anticipated impacts of climate change on this critical resource and contribute to the Provincial Government's goal to increase the efficiency of water use by 33% by 2020. Approximately 80% of the Township's water supply is provided from municipal and private wells. There are 18 active municipal wells, a number of community well systems, and at least 5,000 private wells, most of which are located in rural Langley.

Metro Vancouver Agricultural Policy

Metro Vancouver has recognized agriculture as an essential component of a sustainable region and a resilient food system. An agriculture committee, created in 2006, provides advice and recommendations to the Metro Vancouver Board on agricultural issues. The committee reviews and monitors an agriculture work program and provides input to staff on policies, projects, and programs. A report entitled "*Local Government Policy Options to Protect Agricultural Land and Improve the Viability of Farming in Metro Vancouver"* was released in April 2010. The report identifies a number of policy and program options to protect agricultural land and improve viability.

Metro Vancouver has also initiated a Regional Food System Strategy with a targeted completion date of 2010. Several events have been held to gather information and develop strategies and actions that will improve the food security and sustainability in the region.

The Regional Growth Strategy (RGS), "*Metro Vancouver 2040,*" aims to safeguard agriculture as an integral part of the region's livability and sustainability. The RGS specifically aims to:

- discourage subdivision of agricultural land;
- minimize disruption of agricultural operations caused by recreational activities;
- identify policies which maintain and improve utility and transportation infrastructure for agriculture; and
- improve the management of the urban rural interface.

It also recognizes the need for financial measures to encourage economic development of the agri-food industry to maintain the farmland base and the viability of the industry.

Agricultural lands are also recognized as a key component of a healthy ecological system for the region.

Metro Vancouver Air Quality Monitoring

Metro Vancouver uses an Air Quality Index (AQI) to provide information about current outdoor air quality at different locations in the Lower Fraser Valley. Monitoring allows for a comparison in concentrations of key air contaminants with air quality objectives. These objectives are intended to minimize the risk to health and the environment posed by each contaminant.

The most recent inventory for the Lower Fraser Valley shows that human activities play a major role in air quality in the Lower Fraser Valley airshed. Emission forecasts help predict how emissions may change in the future, as our population continues to grow and the demand for energy increases.

To support efforts to maintain and improve air quality in the Lower Fraser Valley airshed, Metro Vancouver adopted its second Air Quality Management Plan (AQMP) in 2005. The AQMP provides new health-based ambient air quality objectives and actions that will guide air quality management in the region over the next decade. The plan strives to minimize the risk to human health from air pollution, improve visibility, and reduce Greater Vancouver's contribution to global climate change.

4.4. Policy Constraints and Opportunities

The combination of high land prices and assorted regulatory and policy constraints makes it very challenging for some types of agriculture to operate viably within the Township of Langley. The agriculture industry in Langley is very diverse. Each type of operation likely has a different list of policy constraints. In discussions with farmers while preparing this profile, there was no single policy or regulation identified as the primary constraint. Instead, most farmers listed a number of regulatory hurdles that affected their operations.

Constraints

As noted above, most farmers list a number of minor regulatory constraints affecting their business. Those that are faced with significant major constraints may have already left the industry. The minor constraints identified in discussions include:

- fisheries regulations and their impact on land use including limiting or restricting production along water courses. The other concern related to this is that fisheries is always considered more important than agriculture;
- access to water for irrigation;
- regional drainage systems or the inability to implement drainage systems;
- the cost of obtaining building permits or approvals for other regulations. For large-scale operations, a building permit may be just a normal operating cost but for small and/or developing farms, the cost - in dollars and time - may be prohibitive. These concerns were expressed with the cost of local regulation but they also apply to the cost of complying with provincial and federal regulations. One example that arose was the cost, for a small producer, to purchase a traceability system for their organic food products;
- signage and visibility to customers. One producer expressed a concern about not being able to post signs that help consumers find her direct farm operation. This particular concern may be

more about improving communication between regulators and farmers because, apparently, signs are permitted; and
- parcelization and small lot farming. The degree to which the Township has been subdivided or parcelized seems to be a widespread concern. It is certainly more challenging, and there are fewer opportunities, to develop viable farm operations on small lots. The challenge is to develop policies that will limit further parcelization and help existing small lot owners make better use of their agricultural land.

Opportunities

There are undoubtedly opportunities for the local industry to increase organic production, niche marketing, agri-tourism, farmers markets, and direct marketing operations targeted at consumers who increasingly want to know where their food comes from.

Greenhouse gas emissions programs will probably increase support for local producers. These programs will likely increase the cost of food for two reasons: transportation costs will increase, making imported goods more expensive; and land, mainly in other areas, could be moved into cropping for biofuels. Small-scale operations generally use less powered equipment, so the price of fuel may have less impact on their operating costs. Overall, their margins may increase as carbon programs change the cost and use of energy.

There are opportunities to market Langley's agri-food industry to consumers in Metro Vancouver. This could include increased marketing of the "Circle Farm" tour. It could include directory signs at key intersections on Highway 1. It could include improved signage throughout the Township to direct visitors to local direct farm market operations. It could include increased support for the local farmers market, small farm development programs through the college, and improved online resources to find local farms.

The BC Agricultural Plan

In 2006, the provincial government launched an industry review leading to the development of *"The BC Agricultural Plan: Growing a Healthy Future for BC Familie*s." Completed in February 2008, the plan outlines 23 strategies and 68 action items for sustaining the BC agriculture industry within five key themes:

- producing local food in a changing world;
- meeting environmental and climate challenges;
- building innovative and profitable family farm businesses;
- building First Nations agriculture capacity; and
- bridging the urban/agriculture divide.

Strengthening Farming Initiative

Strengthening Farming is an initiative of the BC Ministry of Agriculture (AGRI) and the PALC. It is designed to promote strong relationships between local and provincial governments and the farming community. The program supports resolution of land use conflicts and planning for community interests in sustainable agriculture and aquaculture in British Columbia. The legislative context for the program rests in the Farm Practices Protection (Right to Farm) Act, the Agricultural Land Commission Act and portions of the Local Government Act and the Land Title Act.

Local Government Act

The Local Government Act (LGA) defines the powers and responsibilities of local municipalities. One of the powers is the authority to adopt bylaws related to disposition of land. While the primary responsibility of the LGA lies with the Ministry of Community and Rural Development, the provisions dealing with farm bylaws (sections 916 - 919) are the responsibility of the BC Ministry of Agriculture (AGRI). These sections allow for the setting of provincial standards for local government (land use and farm) bylaws; enable the development of special bylaws for farming; and direct that local government bylaws be reviewed in relation to the provincial standards.

On July 28, 1997, the Minister of Agriculture and Lands applied sections 903(5) and 917 of the LGA to the Township of Langley. Section 903(5) prohibits the Township from exercising its zoning powers on ALR lands, while section 917 prohibits the Township from passing bylaws that restrict the operation of a farm business without the approval of the Minister. The Township is working with the BC Ministry of Agriculture (AGRI) and the PALC to review the zoning bylaw to ensure that it does not restrict or prohibit agriculture.

4.5. Governmental Properties in the ALR

Government-owned properties in the ALR are shown in Figure 1.

In the past, significant areas of Crown land (specifically Green Belt lands near Highway 1 and 232 Street) were leased to farmers. These were long-term leases that allowed new farm starts, in some cases, and expansion of existing operations in others. Land leased from the government, within the Township of Langley, has declined from 461 hectares (1,139 acres) in 1991 to 269 hectares (664 acres) in 2006.

In the Township, there is a total of 1,862 hectares (4,601 acres) of land owned by the Department of National Defence, First Nations, Metro Vancouver (regional parks), the Langley School District and the Township of Langley. These properties amount to approximately 8% of the total land area of the ALR in the Township.

The Canadian Forces Base (Aldergrove) occupies 505 hectares (1,248 acres) of land, the majority of which is prime soils. There is potential for this land to be used for agriculture if the use is consistent with the policies and land use requirements for the Department of National Defence. It has been leased for pasture use in the past.

First Nations lands occupy 205 hectares (505 acres) of land within the Township. With the introduction of the *Agricultural Land Commission Amendment Act, 2004 (Bill 27)* a new, considerably more streamlined process was introduced to allow for First Nations who have reached an Agreement-in-Principle to apply to the ALC for exclusions.

Regional parks, which account for almost 1,000 hectares (2,471 acres) of land, comprise valuable natural and cultural assets for both the Township and the region. There is some concern from farmers that park acquisitions by the regional government could continue to erode agricultural land. However, with the exception of Campbell Valley Regional Park, large parks are not on prime soils and may be better served as parks or educational centers where citizens of the Township can appreciate the cultural and historical legacies of these areas.

Institutional lands such as those owned by the School District and the Township, for schools and local parks, are typically small parcels that are less than 10 hectares (24 acres) and are not on prime soils. These sites are generally not considered to be opportunity sites for agriculture.

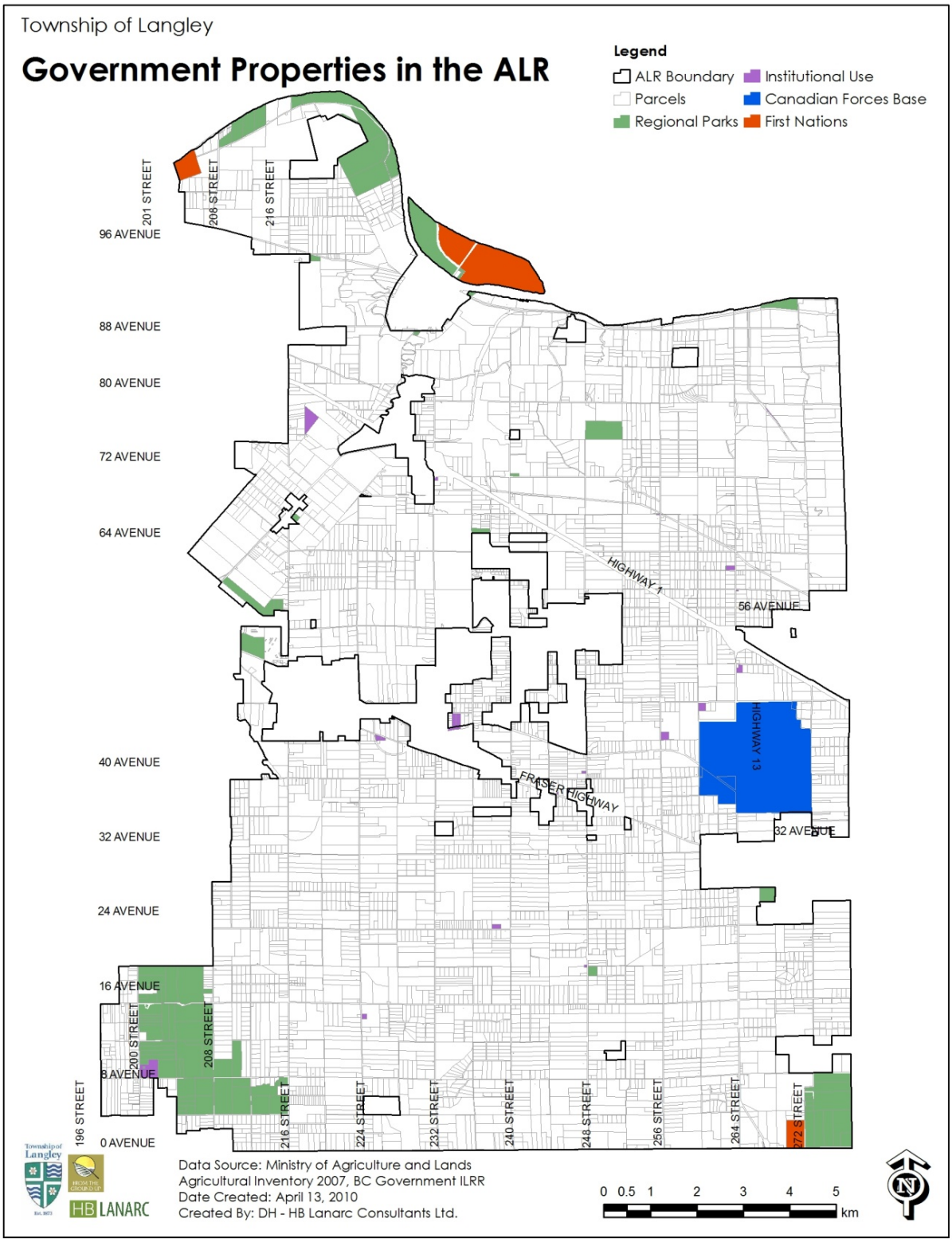


Figure 1. Government Properties in the ALR, 2010

5. Biophysical Characteristics

5.1. Soil Capability for Agriculture

The soil capability analysis in this report is based on the Langley/Vancouver area of the Lower Mainland soil inventory mapping data (1:25,000) and the Canada Land Inventory Level 1 Soil Capability for Agriculture data (1:50,000).

Soil Capability Rating System

Land capability for agriculture ratings are determined by a combination of soil and climatic capability for agriculture with soil characteristics. Soils are inventoried and classified with key limitations of the land for agriculture. Agricultural capability classes range from Class 1 to Class 7, with Class 1 to 3 considered as "Prime" and Class 7 as non-arable. Each soil area has two ratings: an unimproved classification and an improved classification. The unimproved classification indicates the numeric capability of the soil in its native state and the main limitations on capability. The improved classification shows the capability of the soil area if these limitations are removed. The definitions of soil classes and limitations (subclasses) are shown below. For example, a soil mapped as Class 4AW (2A) has an unimproved rating of Class 4 with limitations caused by aridity (A) and excess wetness (W). It can be improved to Class 2A with drainage improvements to remove excess water, and irrigation to provide water in dry summer periods.

The Agricultural Land Commission generally uses the improved soil capability rating for decision-making purposes. The categories and their descriptions are shown in Table 2 and Table 3.

Table 2. Canada Land Inventory (CLI) Soil Capability for Agriculture Classes

Class	Description
Class 1	No or only very slight limitations that restrict use for the production of common agricultural crops.
Class 2	Minor limitations that require good ongoing management practices and/or slightly restrict the range of crops.
Class 3	Limitations that require moderately intensive management practices and/or moderately restrict the range of crops.
Class 4	Limitations that require special management practices and/or severely restrict the range of crops.
Class 5	Limitations that restrict its capability to producing perennial forage crops and/or other specially adapted crops.
Class 6	Non-arable but is capable of producing native and/or uncultivated perennial forage crops.
Class 7	No capability for arable culture or sustained natural grazing.

(Source: Agriculture and Agri-Food Canada, 2010)

Table 3. Capability Subclasses

Subclass	Description
A	Aridity or soil moisture deficiency
C	Adverse climate
F	Low fertility
I	Inundation by streams or lakes
M	Moisture limitation
P	Stoniness
R	Consolidated bedrock
T	Topography
W	Excess water
X	Cumulative minor adverse characteristics

Source: Agriculture and Agri-Food Canada, 2010

5.2. Unimproved Soil Capability for Agriculture

Figure 2 and Figure 3 show the unimproved soil capability of soils within the Township of Langley ALR. Highlights include:

- Class 1 to 3 - Prime agricultural land 12,263 hectares (30,302 acres) or 52.4% of ALR land, are rated Class 3 unimproved or better. Without improvements, there are no Class 1 soils in the study area. Drainage, topography, and moisture deficiency are the main limitations on the capability of the Class 1 to 3 soils;
- Class 4 soils cover 7,006 hectares (17,312 acres) or 29.9% of ALR land. Drainage, topography, undesirable soils structure, and moisture deficiency are limiting factors on the capability of these soils for agriculture and these are marginal for many crops;
- Class 5 soils account for 1,590 hectares (3,933 acres) or 6.8% of ALR land;
  NOTE: Class 4 and 5 are generally well suited to perennial forage production. In some cases, they may also be well-suited to other crops like raspberries and grapes that require well drained soils. In Langley, Class 4 and 5 soils tend to be limited by excess moisture (i.e. poor drainage), topography and aridity or droughtiness (i.e. too well drained);
- Class 6 soils make up 0.3% of ALR land; and are generally non-arable but may grow forage;
- Class 7 soils account for 1,178 hectares (2,910 acres) or 4.7% of ALR land. Soils are limited by their steep slopes and drainage and are non-arable;
- Lastly, organic (peat) soils account for 1,304 hectares (3,222 acres) of the total area (5.5%) - as shown in Figure 3.

5.3. Improved Soil Capability for Agriculture

Figure 4 shows a summary of the capability of improved soils and indicates the limitations that must be removed, with management or land improvements, to increase productivity. The improved soil capability for agriculture mapping indicates there are large areas of prime agricultural land within the Township of Langley. It is very clear that a large portion of the Township can be highly productive agricultural land, especially with access to appropriate drainage and irrigation improvements.

35% of the ALR land in the Township can be improved with irrigation and/or drainage. These types of improvements are critical to developing agricultural potential in the Township of Langley. However, these efforts are challenged by water scarcity and the high cost of developing infrastructure for

irrigation. Drainage improvements are also capital intensive. They often require work that affects a number of land parcels and can compete with, or threaten, fish habitat or habitat management. Regional irrigation and drainage improvements require cooperation between landowners and agencies.

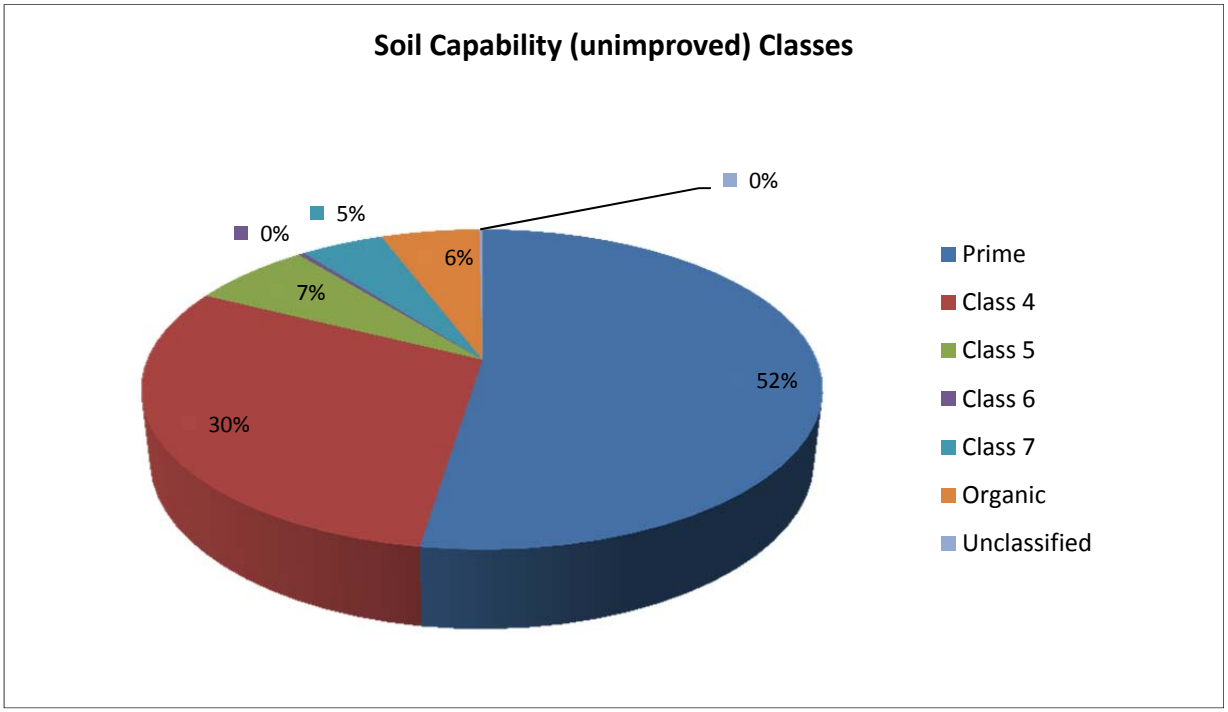


Figure 2. Percentage Breakdown of Unimproved Soil Capability Classes

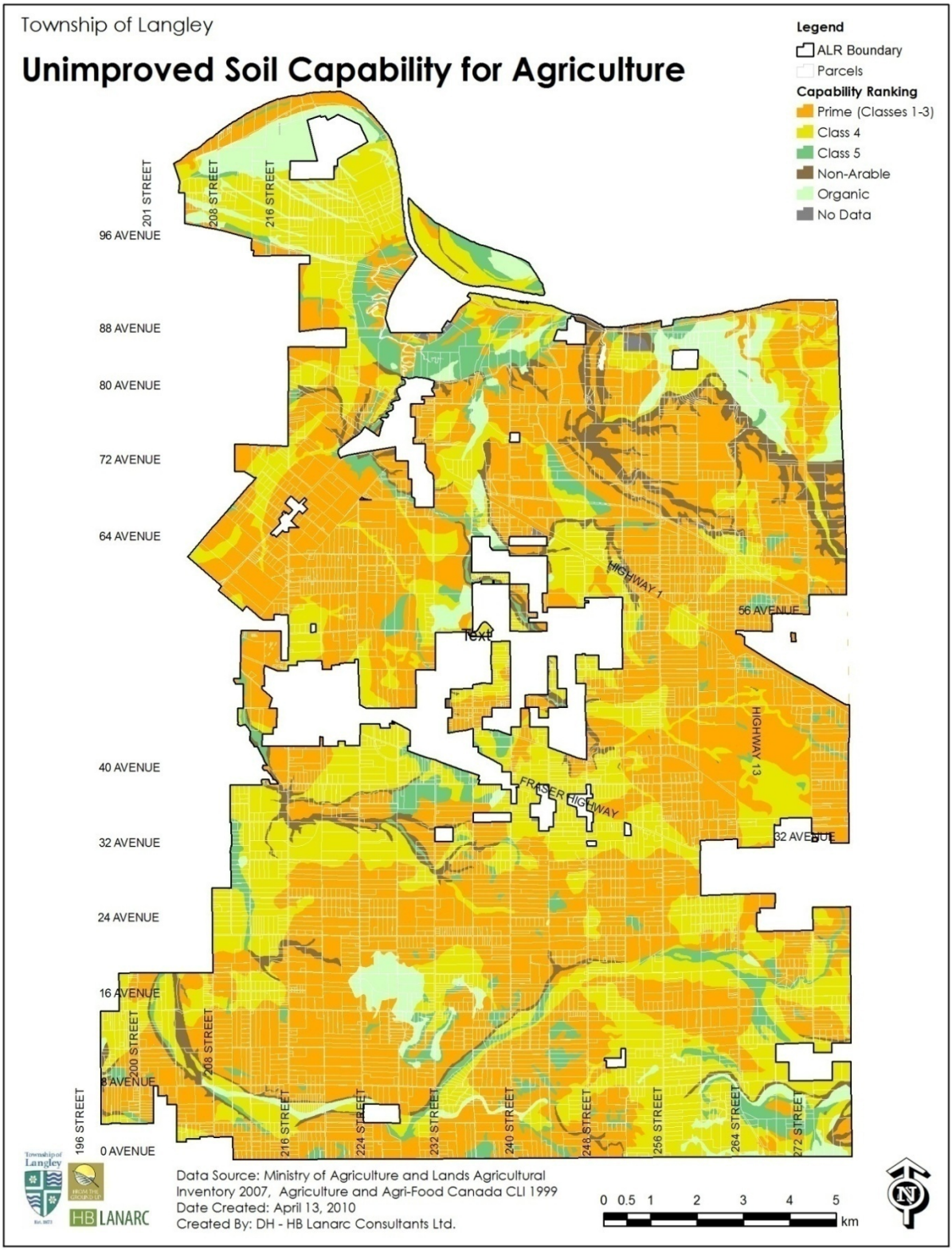


Figure 3. Unimproved Soil Capability for Agriculture

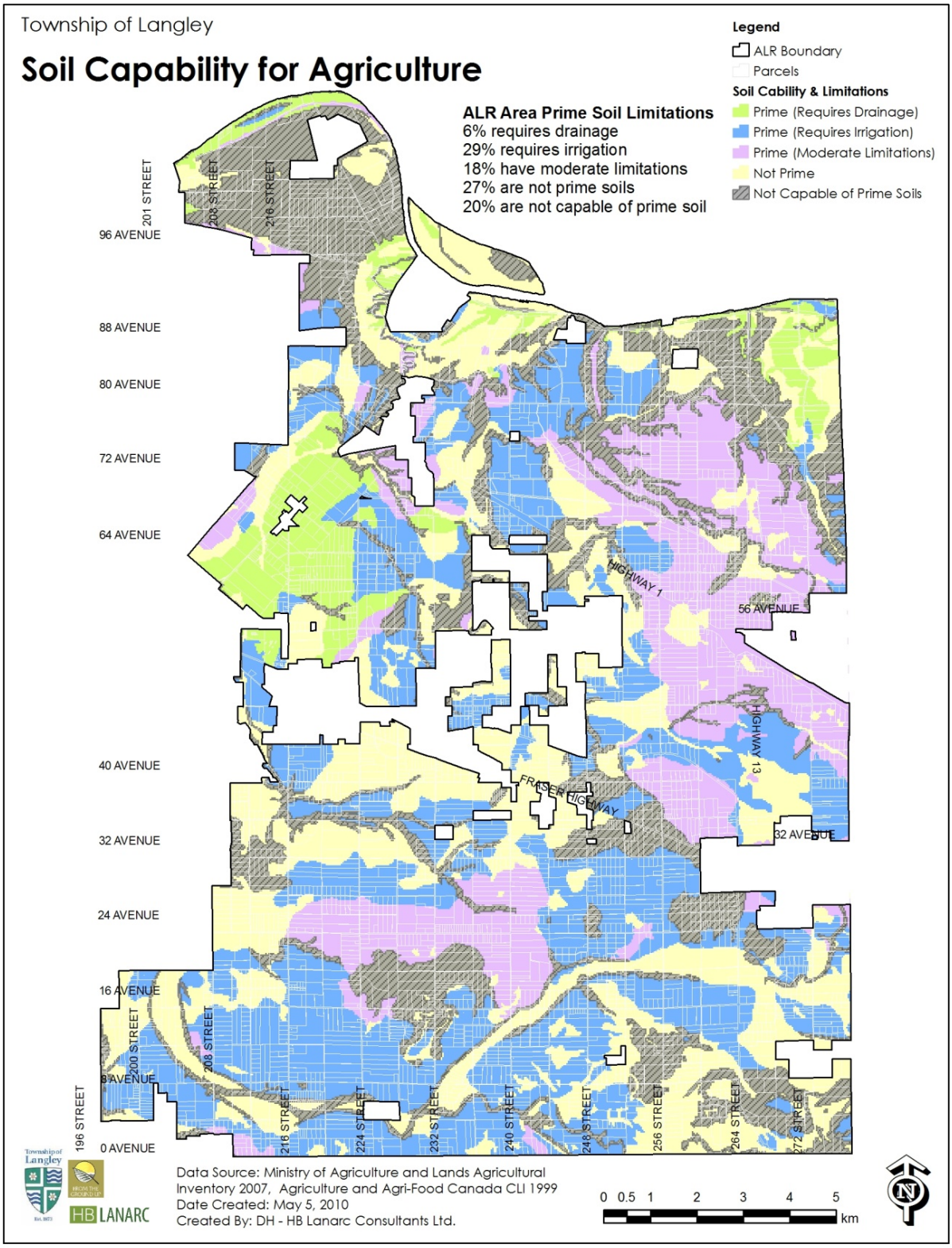


Figure 4. Soil Capability for Agriculture

5.4. Soil Capability and Non-Agricultural Uses

35% of the ALR area in the Township of Langley is not currently used for agricultural activities – as shown in Figure 5. Table 4 lists the most common non-agricultural uses within the ALR. Most non-agricultural land use in the ALR is residential, with commercial and natural uses also being common. Non-agricultural competition for the fixed ALR land base increases pressure on agriculture.

Table 4. Breakdown on Non-Agricultural Uses in the ALR

Actual Use (Sourced from BC Assessment)	Area in Hectares (acres)	Percentage
Commercial/Service Use	63 (156)	1%
Golf Course	285 (704)	5%
Institutional Use	48 (119)	1%
Land in Transition	97 (240)	2%
Military Area	362 (895)	6%
Not in use	901 (2,226)	14%
Park	642 (1,586)	10%
Other Uses	59 (146)	1%
Recreational Use	189 (467)	3%
Residential Use	2,506 (6,192)	40%
Transportation and Communications	95 (235)	2%
Unknown (i.e. parcels that had no actual use identified in the most recent assessment of parcels in the ALR)	1,085 (2,681)	17%
Total	6,332(15,640)	100%

(Source: Township of Langley, 2006)

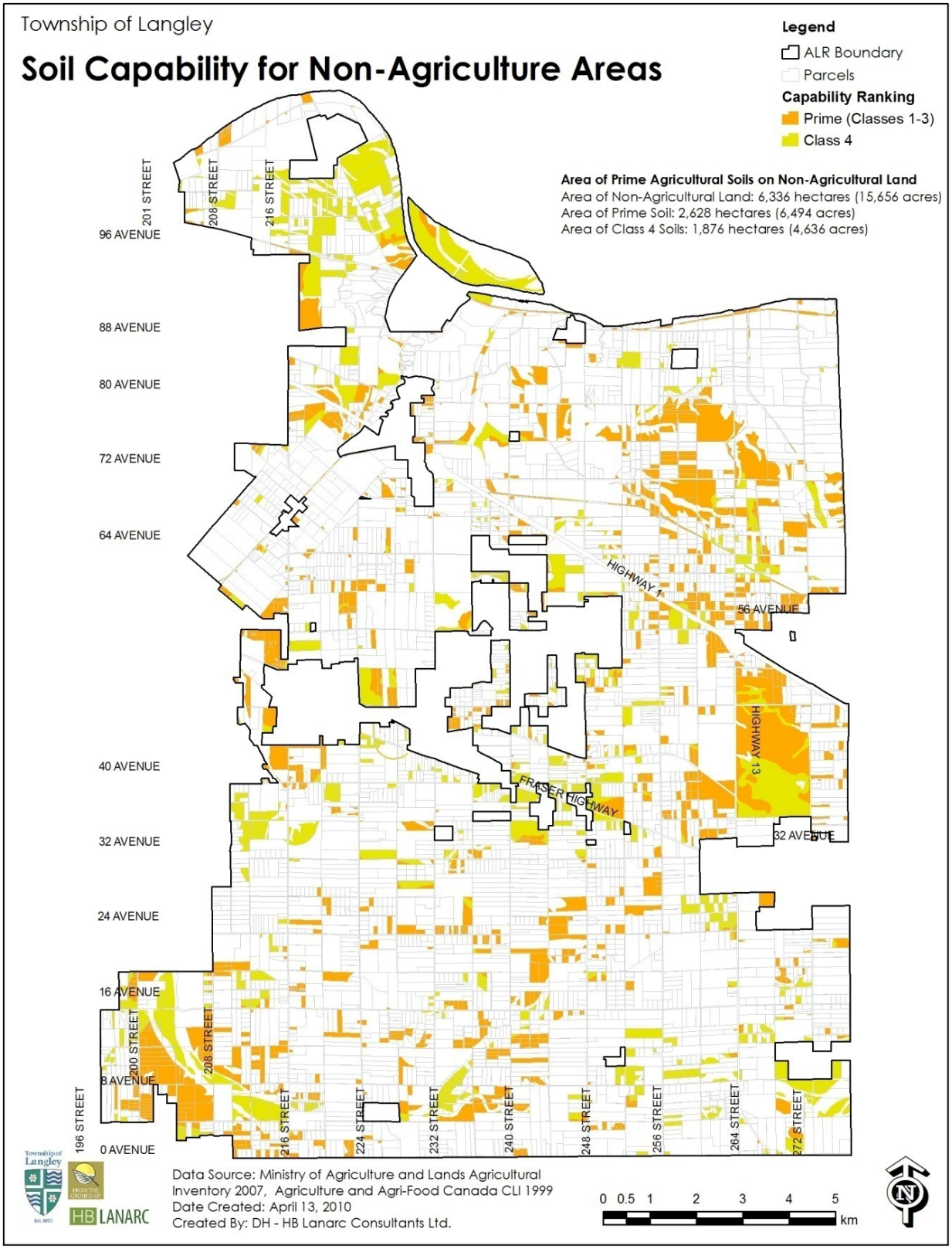


Figure 5. Soil Capability for Non-Agricultural Areas

5.5. Watercourses

Figure 6 and Table 5 display the location and classification of watercourses and indicate fisheries habitat values for each watercourse. The fisheries watercourse classification data was produced, cooperatively, by Fisheries and Oceans Canada, Ministry of Water, Land and Air Protection, and the Langley Environmental Partners Society. The word "fish" refers to salmonid and endangered fish species only. The phrase "fish bearing" refers to watercourses having a fish population present at some time during the year (Provincial Water Act definition). The word "watercourse" refers to the definitions of "stream" and "ditch" as indicated in the Provincial Water Act. The phrase "no documented fish presence" infers that long-term fish sampling as per BC Ministry of Environment suggested sampling protocol has not been done. However, based on available habitat information and limited fish sampling results, in most cases it may be interpreted as "no fish presence."

Table 5. Stream Lengths by Fish Presence Classification

Class A Red – Year round fish presence:	514.7 km (319.8 miles)	35.2 %
Class A Orange – Winter fish presence:	130.1 km (80.9 miles)	8.9 %
Class A Magenta – Year round non-salmonid fish presence:	80.4 km (50.0 miles)	5.5 %
Class B Yellow – No fish presence, beneficial to downstream fish populations:	329.0 km (204.4 miles)	22.5%
Class B Green – No fish presence, non-beneficial:	408.0 km (253.5 miles)	27.9%
Total linear length of watercourses classified within the ALR:	1,462.2 km (908.6 miles)	100.0%

(Source: Township of Langley and Fisheries and Oceans Canada)

About 56% of the ALR parcels in the Township of Langley contain land that is within 60 m of a fish-bearing stream. This has very significant implications for agriculture. Approximately 50% of all watercourses have fish presence (Class A red, orange, and magenta). Streams dissect properties and fields making crop management more challenging and, in some cases, preventing farmers from using isolated areas of the farm. Significant areas of production can be lost to riparian management. Cleaning and maintenance of on farm ditches is often restricted. Indeed, the total amount of land impacted by the watercourse protection of the streamside setbacks at 10 metres within the ALR would be 3,360.9 hectares (8,304.9 acres).

In addition, for some farms, livestock should be kept out of watercourses to protect habitat and prevent water pollution. This means that water for livestock must be provided away from the side of the stream; in the past, right or wrong, it was common for livestock to drink from watercourses. Essentially, farmers are expected to provide and protect habitat for fish. This has the potential to remove more land from agricultural use than any other competing land use. Despite this, there are some very good examples of farmers and fisheries working together to produce very positive results for both resources.

Distance from Fish Bearing Streams

Fish bearing streams enhance the level of biodiversity in an area but they also represent a constraint to agricultural development. Regulations can limit the amount of area that farmers are able to use for agricultural production near fish bearing streams. The watercourses and the riparian vegetation adjacent to these watercourses are protected as fish habitat under the Federal Fisheries Act and provincial Fish Protection Act. Restrictions on farming can include ditch maintenance, irrigation water availability, and protection of riparian areas through setbacks. Restrictive regulations can add to the cost of production and alienate productive farmland.

In the Township of Langley, a total of 14,847 hectares (36,689 acres) are affected by adjacency to fish bearing streams (i.e. are within 60 metres, or 196 feet, of a stream). Figure 7 represents the distance to fish bearing streams for farms by count in the Township of Langley.

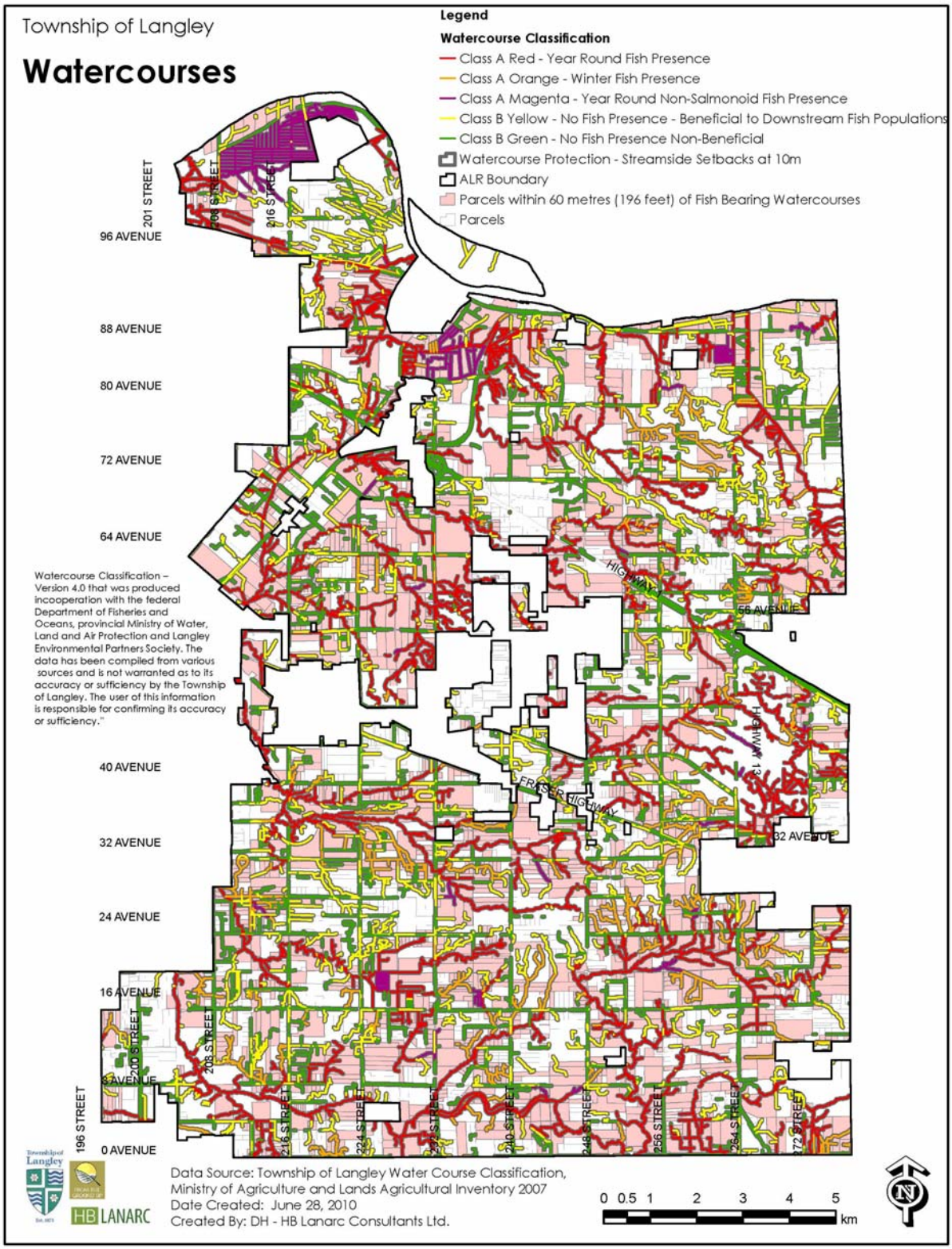


Figure 6. Watercourses

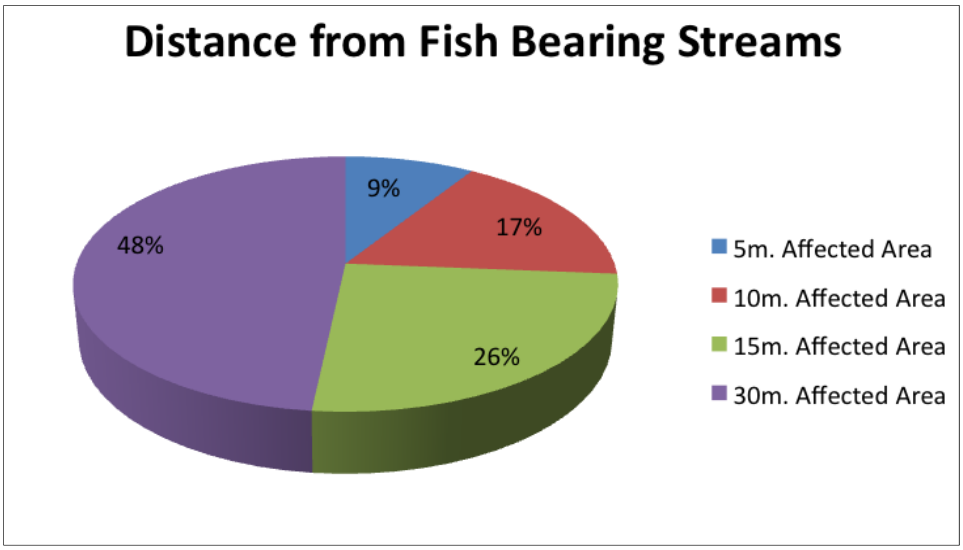


Figure 7. Distance from Fish Bearing Streams

5.6. Major Aquifers

There are 18 major aquifers present in the Township of Langley. These aquifers include Abbotsford, Aldergrove AB, Aldergrove CD, Aldergrove Quadra, Beaver River, Brookswood, Clayton, Fort Langley, Glen Valley, Hopington AB, Hopington C, Langley Upland Interill, Nicomekl Serpentine, Salmon River, South of Hopington, South of Murrayville AC, South of Murrayville B, and West of Aldergrove. These aquifers supply water for residential, commercial, industrial, and agricultural purposes and provide base flow for local fish-bearing streams. They are recharged entirely by rainfall.

Five aquifers have significant economic and hydrologic impacts on the Township. However, four of the five are unconfined, which means they are relatively shallow and susceptible to contamination. Using water from unconfined aquifers is also of concern to fisheries managers because groundwater pumping creates a short-term potential to affect surface water flows and long-term potential to lower the water table. A discussion of the five aquifers is provided below.

Hopington Aquifer

The Hopington Aquifer (Hopington AB and Hopington C) occupies 40 square kilometres within the headwaters of the Salmon River. The aquifer is comprised of glacial outwash sediments and is up to 50 metres in thickness. The aquifer is largely unconfined (Hopington AB) except in the southern area (Hopington C), where it is confined by low-permeability surface sediments. Local perched water table aquifers are sometimes present above the Hopington Aquifer. According to studies completed by the Province, the Hopington Aquifer, which supplies drinking water to 3000 homes, is currently classified as one of the three most fragile aquifers in the province. Groundwater levels have been falling in the aquifer for many years and there are concerns about the quality of the water. The large mix of uses (residential, agricultural, transportation) will continue to stress this aquifer into the near future.

Aldergrove Aquifer

The Aldergrove Aquifer (Aldergrove AB and Aldergrove CD) is a shallow confined to semi-confined aquifer occupying a 47 square kilometre area. The aquifer is composed of several discrete bodies of glacial marine outwash sand and gravel, and is approximately 15 metres thick. The Aldergrove Aquifer is

hydraulically connected to the Abbotsford Aquifer and may be hydraulically connected to the Hopington Aquifer as well.

Abbotsford Aquifer

The Abbotsford Aquifer, also known as the Abbotsford-Sumas Aquifer, covers a broad area of about 100 square kilometres. While most of the aquifer lies in Abbotsford and northern Washington State, the west edge of the aquifer lies beneath the southeast corner of the Township of Langley. The aquifer is comprised of unconfined sands and gravels deposited during the glacial advance, and is less than 14 metres thick. The aquifer is hydraulically connected to the Brookswood and Aldergrove aquifers.

Brookswood Aquifer

The Brookswood Aquifer, or Langley-Brookswood Aquifer, is composed of a raised glacial delta along the west boundary of the Township. It covers an area of about 33 square kilometres that extends into the City of Surrey. The aquifer is comprised of sands and gravels with an average thickness of 24 metres. It is unconfined and the water table is generally shallow.

Fort Langley Aquifer

The Fort Langley Aquifer is comprised of recent sediments associated with a former channel of the Fraser River. The Fort Langley Aquifer occupies a five square kilometre area south of Fort Langley. The aquifer is unconfined and is less than 13 metres thick.

Agricultural Impacts on Aquifers

Agriculture has two potential impacts on aquifers:

1) Removal of irrigation water. Agriculture removes water and potentially lowers the water table. In the Langley area, only 9% of the farmland is irrigated. Increased irrigation would allow higher value crops and a wider range of crops. Approximately 27% or 10,052 hectares (24,839 acres) of land could be improved with irrigation water. The water table in the existing aquifers is generally dropping so increased withdrawals of water for agricultural irrigation will put more pressure on these aquifers. The BC Ministry of Agriculture (AGRI) is planning to evaluate and develop a model that will measure agricultural water use within the Township.
2) Potential pollution from leachate. Vulnerable aquifers can also be polluted with leachate from agricultural inputs. This type of pollution has happened in the Fraser Valley mainly from livestock manure stockpiled, over winter, on lands where shallow vulnerable aquifers are present. Environmental Farm Planning has helped to identify pollution threats and correct potential problems.

Aquifer protection is essential for sustainable use of the groundwater resources and for the protection of associated ecosystems and human uses. Although buried, aquifers can be sensitive to contaminants. The sensitivity of an aquifer can vary greatly, depending on geologic conditions. The implementation of land-use planning or zoning overlays based on aquifer vulnerability can prevent aquifer contamination by carefully locating potential contaminant sources in areas of very low aquifer sensitivity. Farmers should also be encouraged to complete Environmental Farm Plans for their operations and make the improvements suggested by the plans.

5.7. Environmentally Sensitive Areas

Natural diversity is the basis of healthy ecological communities. Protecting natural ecosystems provides clean air, water, and soil and healthy populations of wildlife and plants.

An Environmentally Sensitive Area (ESA) designation identifies areas where the landscape, wildlife, ecological function or historic value is of importance or is endangered. ESA mapping in the Township of Langley was conducted in 1993 and was based on an inventory of biophysical and cultural resources. The Township of Langley uses the ESA inventory and maps as an initial environmental screening tool when reviewing development applications to decide on appropriate measures for developers to undertake to protect the environment.

The ESA designations were based on the following features:

1) Geological hazard potential
2) Groundwater resources
3) Natural vegetation and wildlife habitat
4) Watercourses, fish resources, and fish habitat
5) Visual assessment and cultural features
6) Public nominations of Environmentally Sensitive Areas

5.8. Natural Land Cover and Type

The Township of Langley has relatively flat topography given its proximity to the Fraser River and as such it contains much fertile Fraser Valley farmland, orchards and deciduous forests, dense with vegetation and native wildflowers. The Township of Langley contains a variety of natural land cover types including wetlands, herb and grass pasture, planted tree farms, natural forest, denuded soils and open watercourses and water bodies.

Table 6 provides an area and percentage breakdown of some major land cover types.

Table 6. Land Cover in Township of Langley

Land Cover	Area in hectares (acres)
Exposed Soils	261 (645)
Forest	7,270 (17,965)
Herbs/Grasses	10,164 (25,117)
Non-natural cover	3,668 (9,064)
Row crops and Tree Farms	607 (1,501)
Shrubs	488 (1,207)
Wetland	351 (867)

(Source: Township of Langley, 2006)

5.9. South Facing Slopes

Figure 8 identifies areas where at least 50% of the parcel is a south facing slope. Parcels with this characteristic comprise approximately 9% of the ALR area. South facing slopes receive more direct sunlight, which results in increased growth potential. The snowpack is lighter and melts faster in the spring. The soil warms more quickly and allows for a longer growing season.

South facing slopes, especially combined with the right soil types and available irrigation water, provide productive sites for a wide range of crops. Certainly, southern aspect (along with well-drained soils) is a key consideration when selecting sites for grape production.

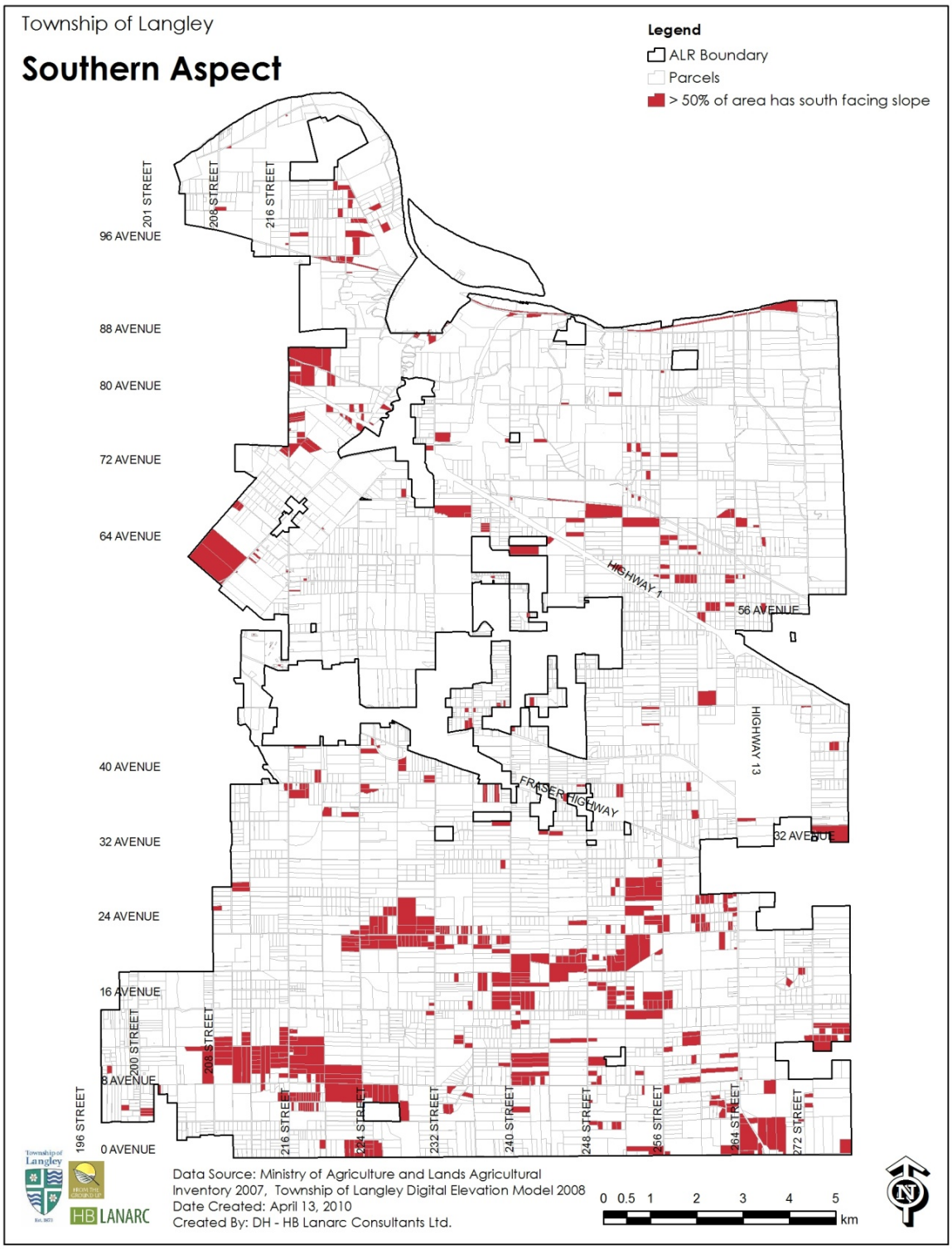


Figure 8. Southern Aspect

5.10. Potential Issues and Constraints to Farming

Figure 9 identifies parcels where a majority of the area has a slope of 15% or more. These parcels comprise approximately 3% of the ALR area. Parcels with steep slopes have limited agricultural potential, because of their higher potential for erosion and resulting increase in sedimentation of surface water. Steep slope lands also have an increased landslide hazard depending on underlying geology, and greater infrastructure cost for development methods (contour farming, bench terracing, etc.).

Steep slopes are generally non-arable. In most cases in the Township, they are found along watercourses. The watercourses and adjacent sloped lands often sever parcels and may prevent access to certain portions of an individual parcel. Building roads and bridges to connect separate portions is very expensive and challenging due to regulatory requirements. The result is that the isolated portions of the properties are not often used to their agricultural potential.

Figure 10 identifies parcels that contain soils located on upland areas. These parcels make up 67% of the ALR in the area. 2,249 parcels can be improved with irrigation. These soils are valuable as there is good drainage but there may be erosion potential.

Upland soils are generally coarser with better drainage. In the Township of Langley, many of these areas have been parceled into properties of 4 hectares (10 acres) or less. These types of properties are not ideal for many forms of agriculture but there are many good potential uses. Intensive horticulture and many types of intensive livestock operations can be feasibly developed on this type of property.

Furthermore, upland ALR areas in the Township could be planned for small-scale farming. There are types of intensive agriculture that can be done on smaller lots which are less than 4 hectares (10 acres) which are not entirely dependent on soil type. These could include mushroom farms, nurseries, organic market gardens, and greenhouses.

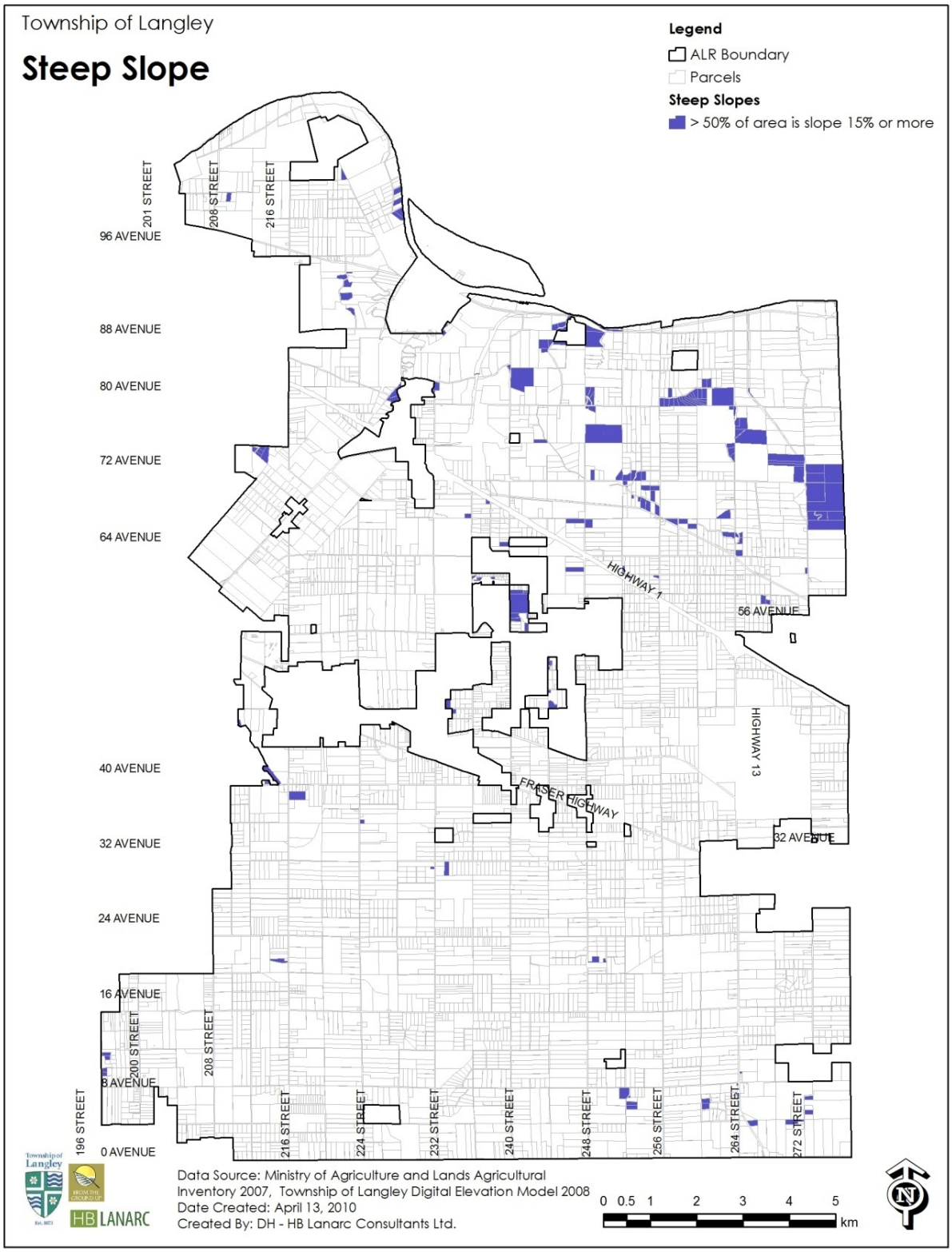


Figure 9. Steep Slopes

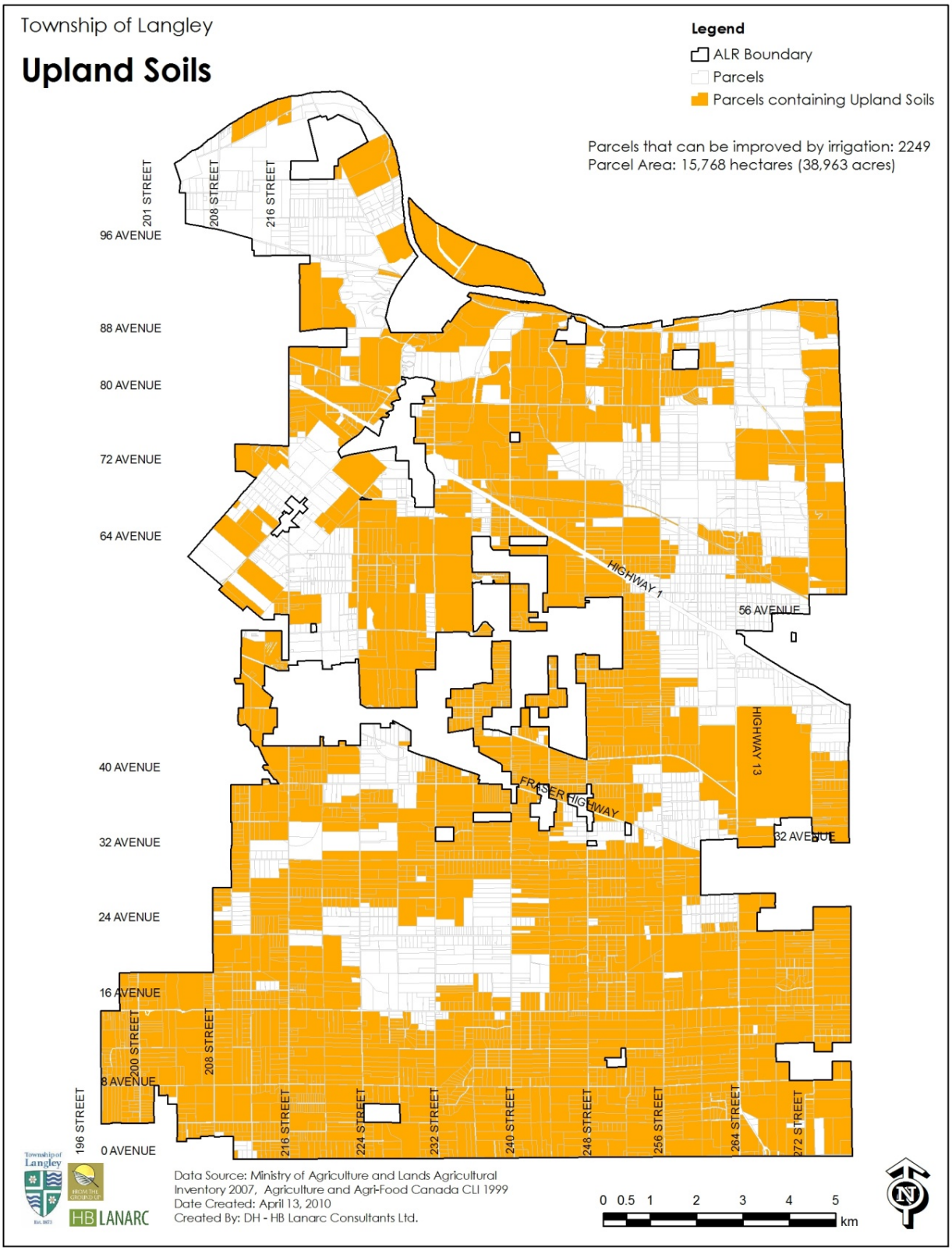


Figure 10. Upland Soils

6. Human Modifications to the ALR

6.1. Water Management

Floodplains and Dykes

Figure 11 displays locations of dyke and floodplain features. It recognizes parcels that are subject to full or partial flooding due to their proximity to areas identified as having flood risk. About 13% of the ALR area, mainly concentrated on the north side of the Township, is at risk for flooding. Table 7 displays the types of agricultural uses that are located on lands within the floodplain.

Drainage systems in the ALR, especially regional drainage systems, tend to be a concern. Many of the watercourses in the Langley area are flat and very slow moving and they cover a large percentage of the Township. Heavy rains cause these to swell into significant streams, which basically "flush" a large part of the agricultural area. Where local or regional drainage improvements have been made, there apparently is not a consensus on how to manage them. Fisheries interests tend to prevail, often at the expense of flooded or saturated farmland.

Historically, agricultural land around Fort Langley has been periodically, and/or seasonally, flooded. Each time this land is flooded, there are crop losses as well as erosion of soils. Efforts to drain this inundated farmland have been met with regulatory challenges from fisheries interests. This area has prime soils so there is also potential for production of high valued crops. There is less competition for these low-lying lands because they are generally not suited for residential development. Flood proofing is not required for non-residential farm buildings except for closed-sided livestock structures, which may be flood proofed to less than those standards specified by the Ministry of Environment and Parks. It is expected that farming in the floodplain will remain a contentious topic well into the future.

There are roughly 10 kilometres of confirmed dykes within the ALR in the Township. Significantly, these dykes protect low-lying areas and critical infrastructure. It is important to note that there are farmed areas of the floodplain that are not dyked. These areas consist of both pasture and livestock operations that could be at threat from increased flooding because of rising sea levels. The table below summarizes the agricultural uses within the floodplain:

Table 7. Area and Percentage Breakdown of Agricultural Uses

Agricultural Uses	Hectares (acres)	Percent of Floodplain
Abandoned or unused farm land	133 (328)	4%
Agri-Industrial	8 (20)	less than 1%
Agri-tourism	16 (38)	1%
Beef Cattle Farm	134 (331)	4%
Beef Cattle Farm - Cow/Calf Operation	18 (44)	1%
Berry Farm	301 (743)	10%
Christmas Tree Farm	15 (38)	1%
Cultivated Land	1 (2)	less than 1%
Dairy Farm	287 (709)	10%
Dairy Farm - Dry Cow Facility	32 (80)	1%
Equestrian Facility	58 (144)	2%
Field Vegetable Farm	32 (80)	1%
Forage Operation	490 (1,210)	16%

Freshwater Aquaculture	2 (4)	less than 1%
Horse Farm	208 (514)	7%
Livestock Operation - Type Unknown	46 (114)	2%
Llama/Alpaca Farm	3 (6)	less than 1%
Nursery	16 (39)	1%
Nursery (incl. Greenhouses)	7 (18)	less than 1%
Nut Farm	11 (27)	less than 1%
Orchard	less than 1 hectare	less than 1%
Pasture	351 (866)	12%
Poultry Farm	4 (10)	less than 1%
Sheep/Goat Farm	33 (82)	1%
Swine operation	8 (20)	less than 1%
Winery	7 (17)	less than 1%
Non-Agricultural Uses	795 (1,964)	26%
Total	**3,014 (7,448)**	**100%**

(Source: Township of Langley, 2006)

Figure 12 categorizes and quantifies water use for irrigation by annual requirements. Currently 2% of parcels have annual irrigation requirements. This is reported in m^3/hectare and is based on average water use for irrigation types and annual reported requirements. Irrigation water use depends on many factors, including type of crop, stage of crop growth, efficiency of irrigation system, climactic conditions, and soil conditions. Figures 12 and 13 provide details on average water use, irrigation practices, and efficiency of irrigation application.

Water has been identified by both farmers and local governments as one of the most significant and universal issues in the Township of Langley. Almost every farm is using groundwater in some capacity. The BC Ministry of Agriculture (AGRI) is monitoring six major aquifers in the region and the water table is dropping in all of them. This is supported and further described in "*Township of Langley Groundwater Management: Case Study.*" Indeed, the number of private wells is unknown, as permits are not required when wells are drilled. Without provincial regulation of groundwater withdrawals, the volume of groundwater extracted for domestic, agricultural and commercial purposes is not known. As such, there is an effort underway by the BC Ministry of Agriculture (AGRI) to identify the major contributors to the decline in water table levels. The findings of this water balance study should be incorporated into this profile as they become available.

6.1.1. Proximity of Agricultural Parcels to Wells

Figure 14 illustrates the proximity to and availability of wells for agricultural land. A privately drilled well provides a clean, safe supply of water. Wells are less likely to become contaminated or affected by seasonal water level fluctuations. Water is important in crop production because it is used in many activities such as irrigating, washing, and cooling. Irrigation water can spread pathogens, microorganisms that cause disease in humans, therefore access to high quality water offers a distinct benefit for agricultural productivity and quality.

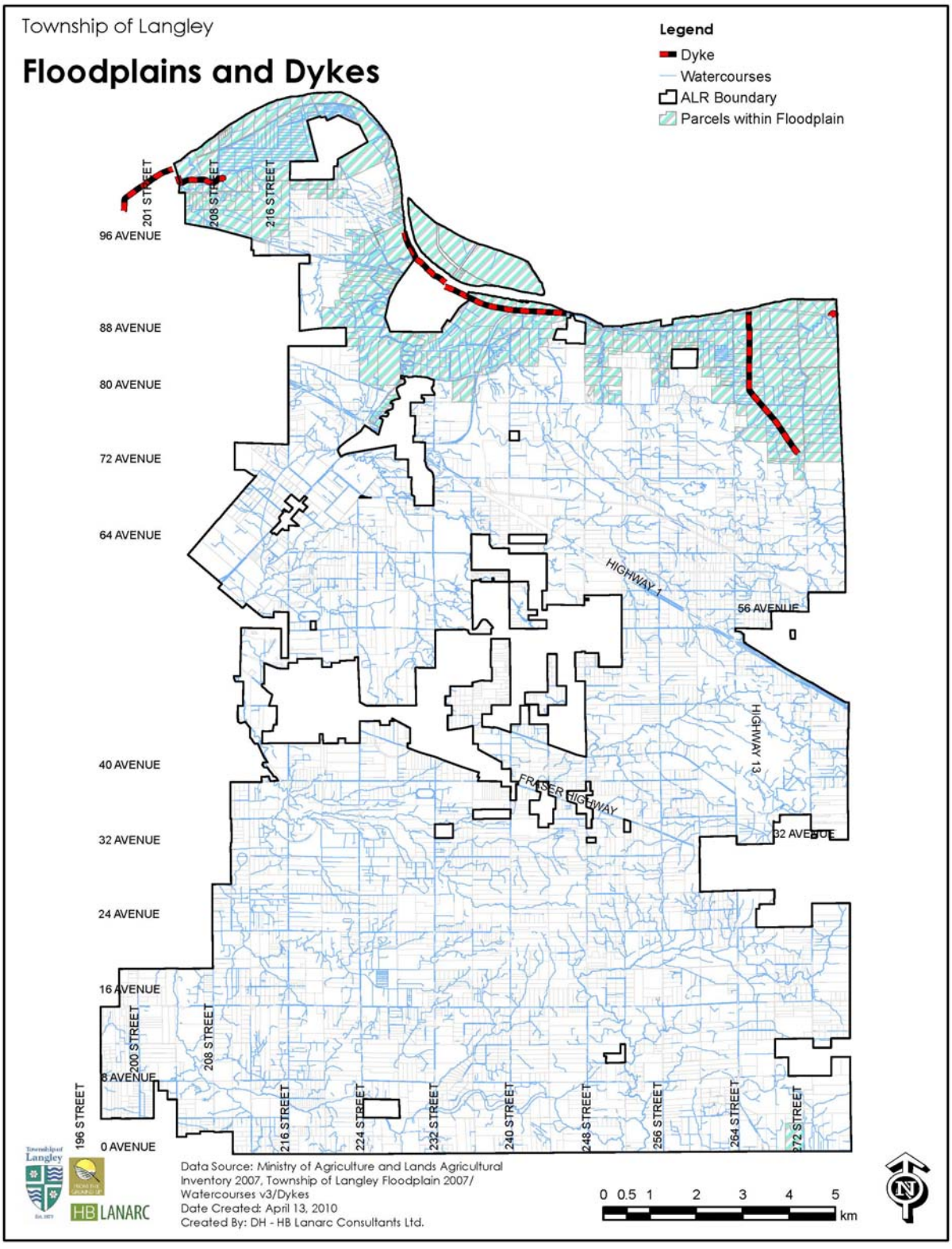


Figure 11. Floodplains and Dykes

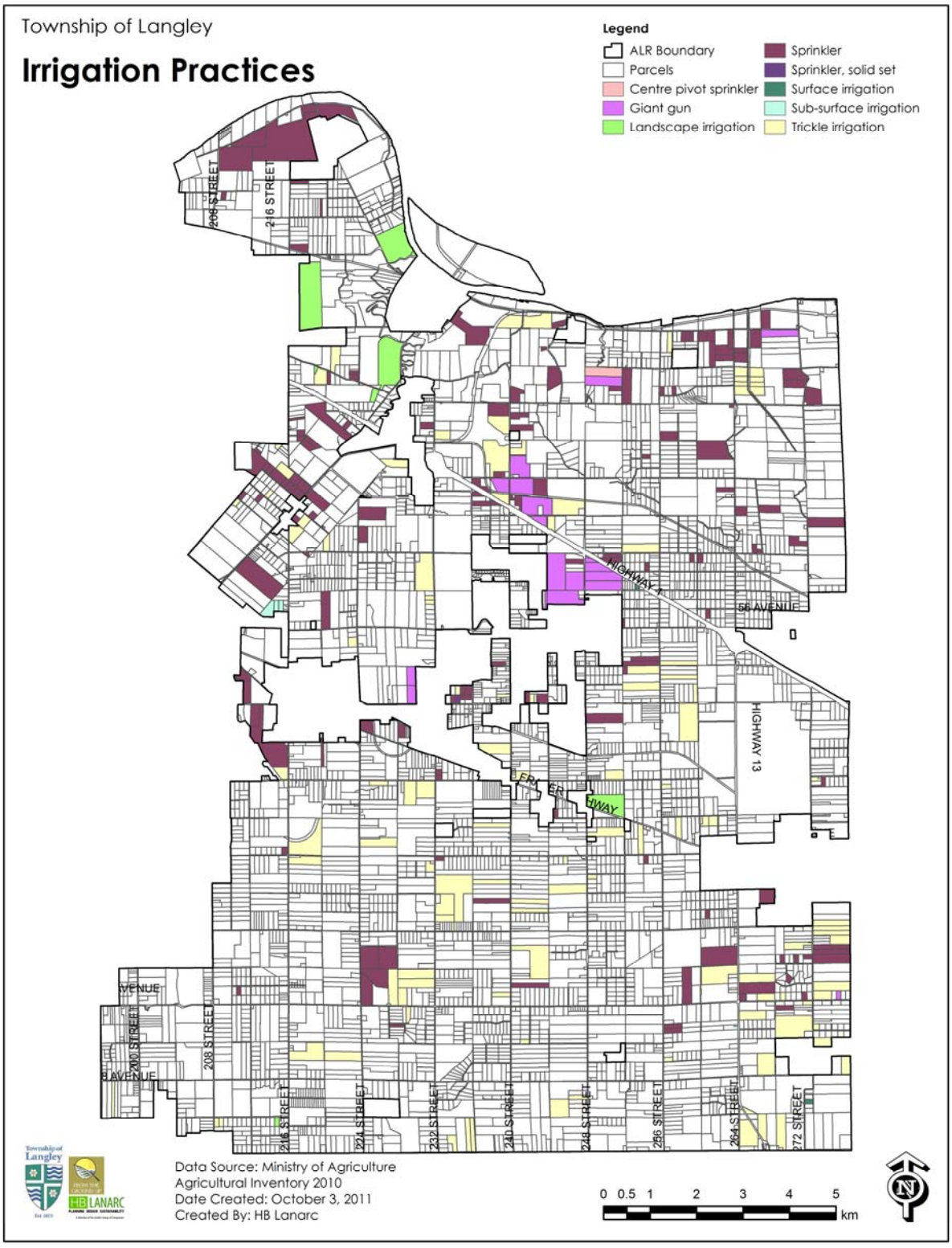


Figure 12. Irrigation Practices, 2010

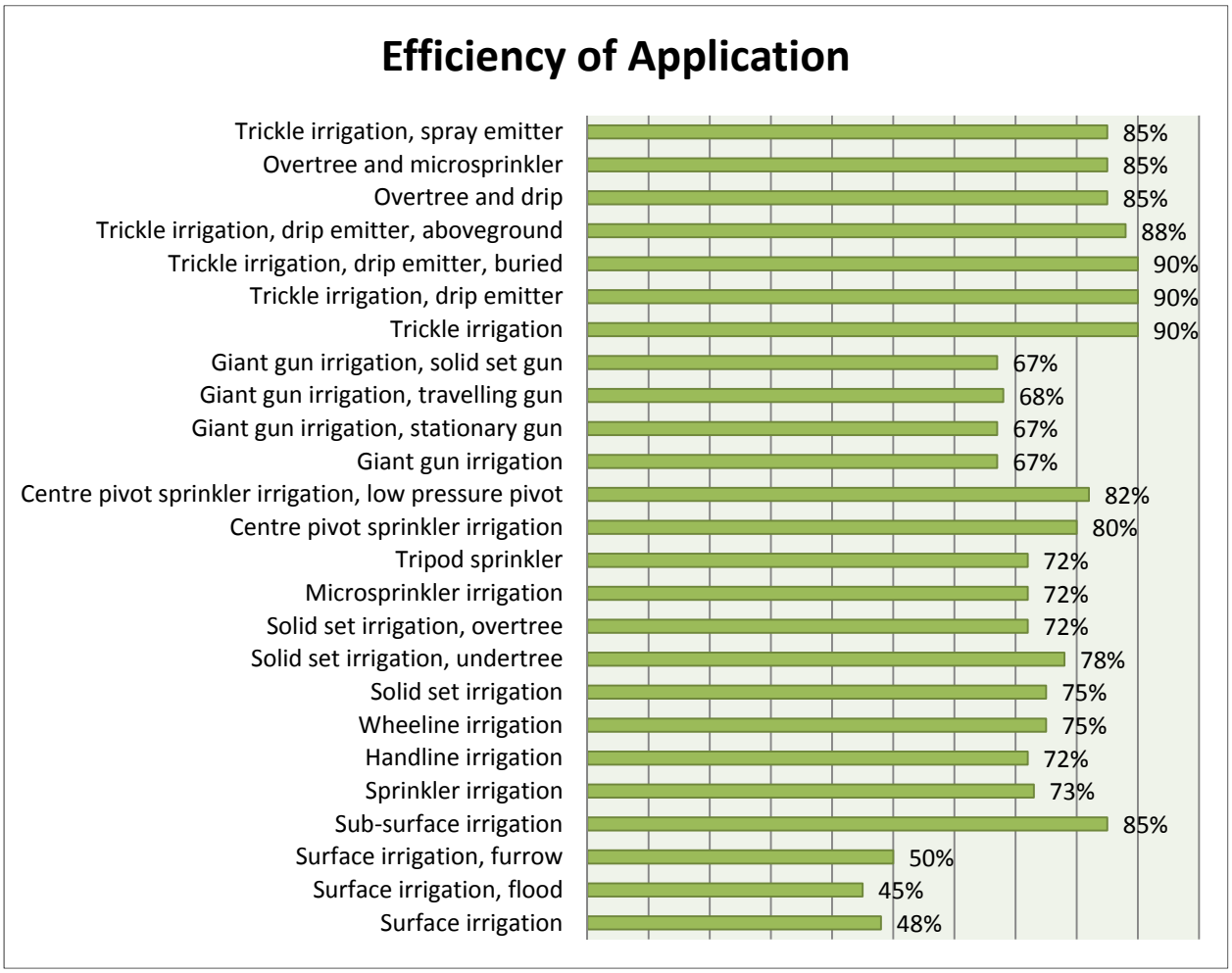


Figure 13. Efficiency of Application

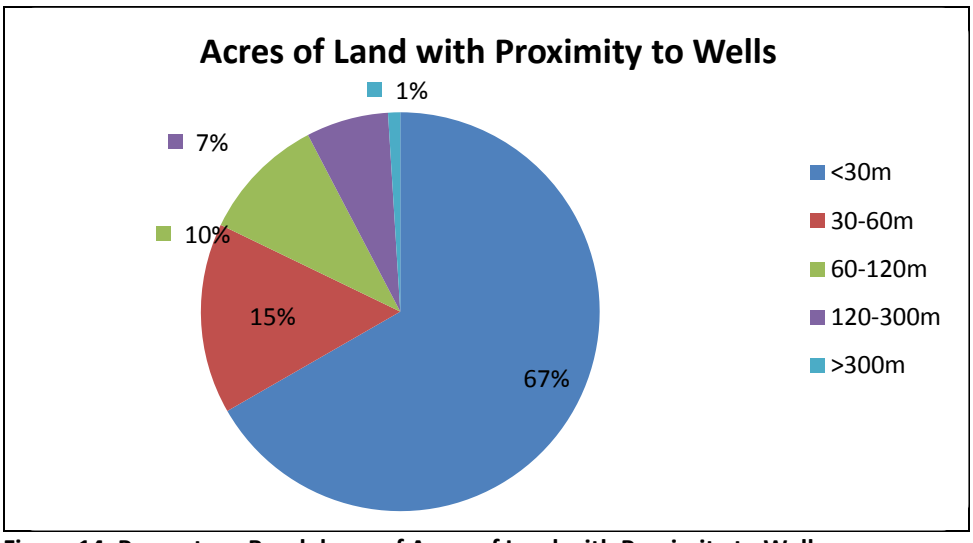


Figure 14. Percentage Breakdown of Acres of Land with Proximity to Wells

6.1.2. Drainage Infrastructure

Ditches are used for water management as aids to drainage (to drain water from low lying areas, alongside roadways or fields) and/or to channel water from a more distant source for irrigation.

Drainage ditches are beneficial to agriculture. Proper drainage systems improve the capacity to handle water contamination, facilitate on-farm drainage improvements (drain tile systems), transport and store water during periods of drought, handle run-off during storm events and prevent flooding and crop loss. The amount of ditches, adjacent to roadways, indicates the extent of the drainage system that has been developed to provide these vital services.

Approximately 16 kilometres of road within the Township of Langley are within 2 metres (6 feet) proximity to a ditch while approximately 150 kilometres of road are within 5 metres (16 feet) as shown in Figure 15.

Narrow roads with deep ditches also may indicate issues for moving farm machinery from property to property or other issues related to conflict between vehicle traffic and farm activities.

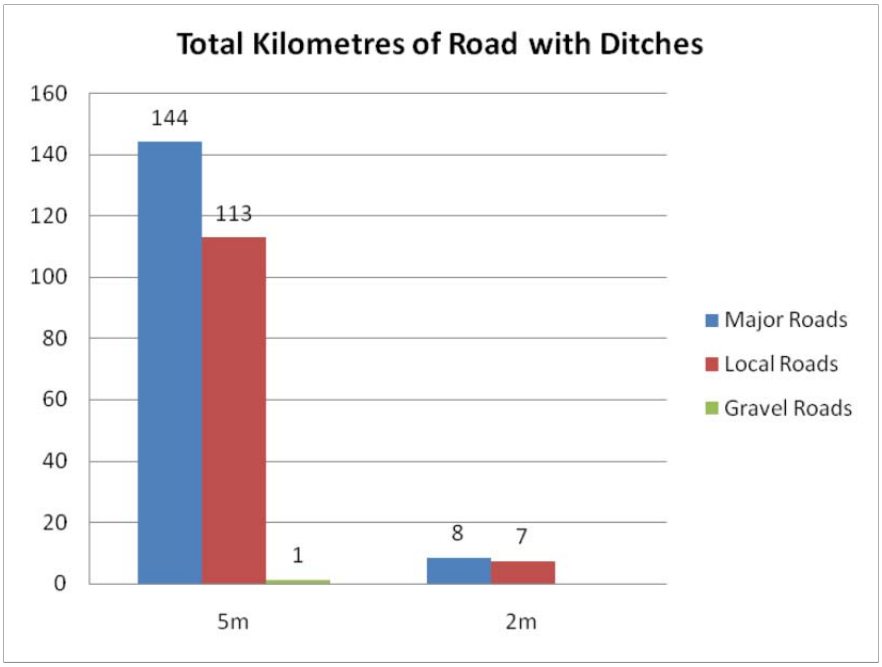


Figure 15. Total Kilometres of Roads with Ditches

6.1.3. On-farm Drainage Systems

No statistics were found regarding the area that has been improved by on-farm drainage systems, namely drain tile. Drain tile systems provide a number of benefits to farms:

- They lower the winter water table, which prevents roots from rotting off. This allows a wider range of crops to be grown on drained lands;
- Deeper winter root growth allows crops to access deeper nutrients and water, during the summer, reducing the need for irrigation water and fertilizer;
- Soils dry and warm quicker in the spring, extending the growing season, and allowing earlier access to fields for cultivation, etc.; and

- Reduce compaction that can occur when vehicles and equipment travel across wet or moist soils.

One of the challenges for installation of drain tile, in some cases, is whether or not there is an outlet along the perimeter of the property to drain the water.

6.2. Roads

Existing Roads and Unopened Road Dedications

Figure 16 classifies the future road network classification in the Township of Langley as defined by the Master Transportation Plan. Arterial roads make up 41% of the road network, while Collectors make up 43% and highways make up 16%. The classification of roads assists in establishing road design features, land use planning policy, mobility, safety, and access requirements. A balance of all road types is needed to achieve mobility for all users. Table 8 provides details on the length of each road type/surface in the ALR in the Township of Langley.

Table 8. Length and Percentage Breakdown of Road Classification

Road Classification	Total length of roads In ALR in kilometres	Percentage
Arterial - Major	81	29%
Arterial - Minor	32	12%
Collector - Major	40	15%
Collector - Minor	77	28%
Highway	45	16%
Total	**276**	**100%**

(Source: Township of Langley, 2006)

Farmers use roads to move from one part of their business to another. Products and employees move from field to field. Inputs are brought in on roads. Product is moved to market. Slow moving vehicles are often used on narrow roads with significant traffic volumes. When there is significant congestion on roads, some farmers may experience delays in bringing their product to market and there can be safety concerns. As well, with the increasing trend of agri-tourism, PALC regulation allowing on-farm processing, and residential densification in non-ALR areas, some roads may not be of sufficient capacity to handle both agricultural and non-agricultural traffic. In addition, at times some road sections may become flooded, which hampers the transportation of agricultural products. However, at present utilization of the land, most roads are considered sufficiently upgraded to handle most agricultural vehicles.

Country Roads Figure 17 establishes the location of key roadway determined to be 'Country Roads' that are identified as having a functional and aesthetic relationship to the rural landscape of the Township of Langley. Country Roads account for 22% of the road network within the ALR. This classification was based on public opinion and the application of design, volume, and biophysical attributes. Country road standards allow narrower road widths and grass shoulders.

Country Roads have character and can add to the appeal, attracting agri-tourists to direct farm markets and other rural businesses. Marketing "a drive in the country" could help enhance sales for these types of businesses.

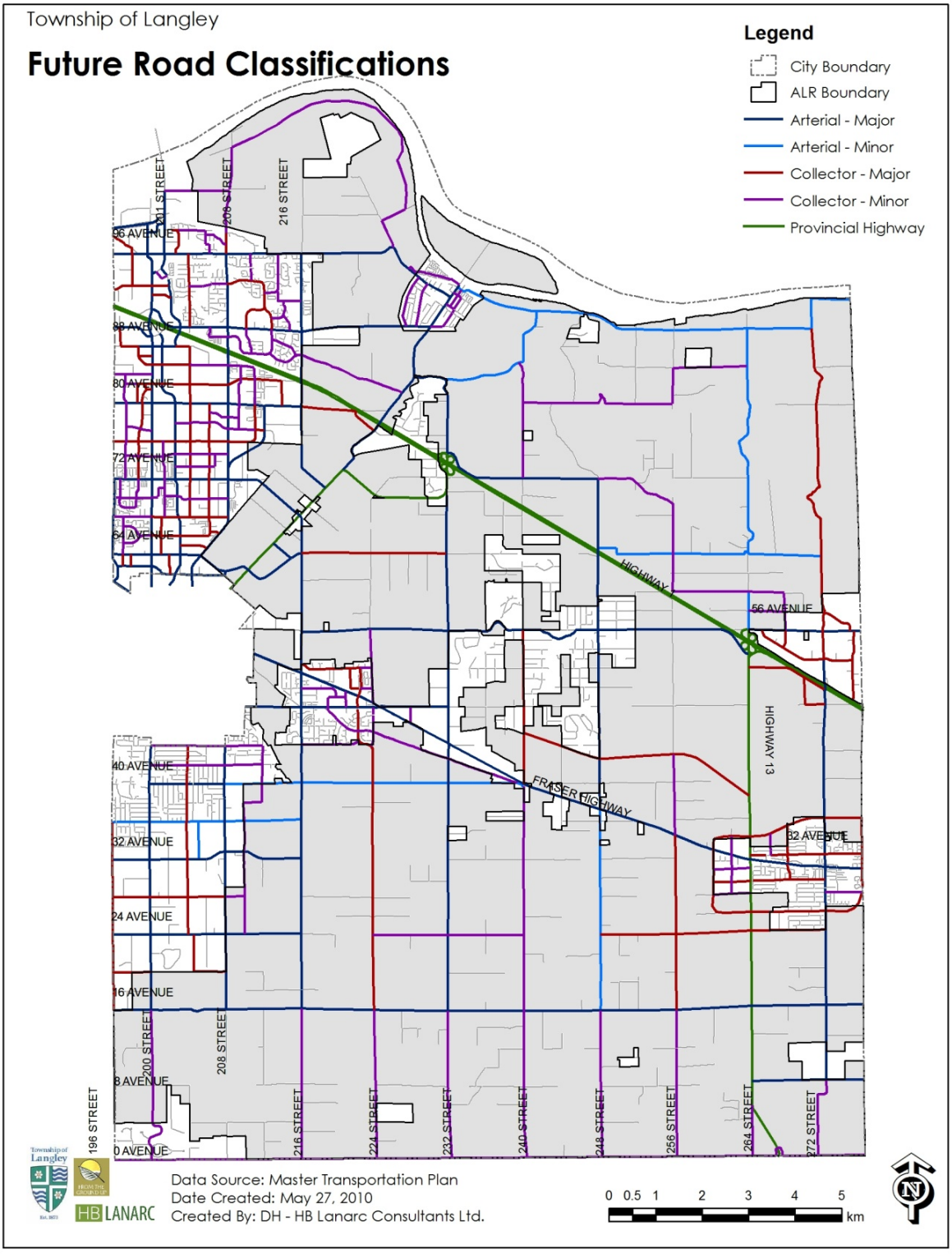


Figure 16. Future Road Classification

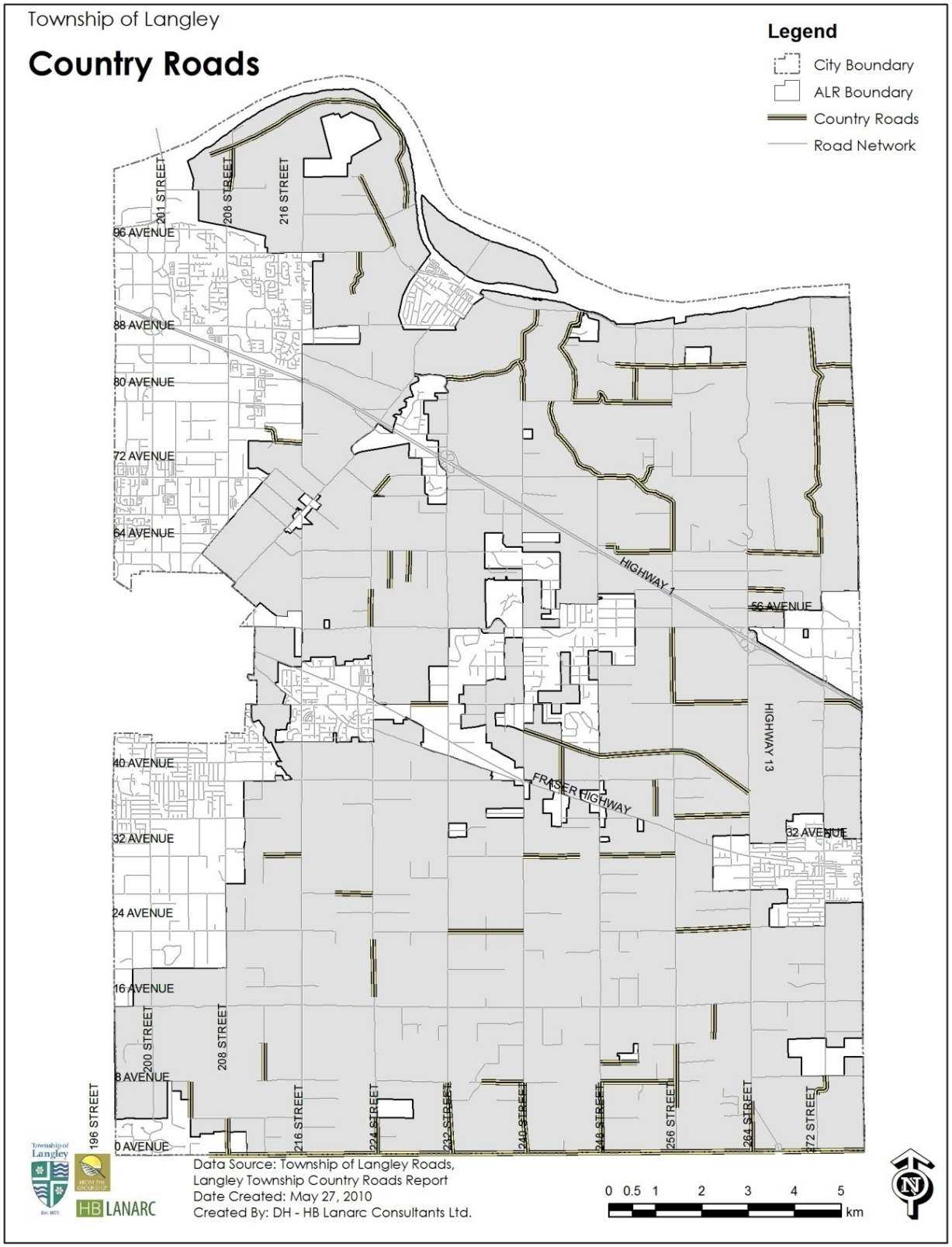


Figure 17. Country Roads

7. Agricultural Production

7.1. Primary Land Use

A primary land use activity is classified for each parcel within the Township of Langley ALR (Figure 18). Agricultural activities (Figure 19) are the primary land use on 39% of the parcels in the ALR area. Residential (where the house occupies 25% of the land base) is the primary land use on 47% of the ALR parcels. It is noted that these properties do have some potential for agricultural uses. Secondary and tertiary land use activities are available as well. Classifications are based on observations of land cover and obvious land use activity. Table 9 lists the types and description of each land use activity. The primary agricultural activity is the one that generates the most revenue.

7.2. Crops

Figure 20 identifies parcels with primarily crop production (grains, legumes, forage, and fruits and vegetables) as a primary agricultural activity - 44% of the active farmland in the ALR. Operations in the Township of Langley ALR include berry and vine crops, field vegetables or flowers, greenhouse operations, mushroom farms, and nursery or tree operations. At the beginning of this document, Table 2 lists the general types and description of crop types.

7.3. Livestock

Figure 21 identifies parcels with extensive livestock (livestock with access to outdoor areas) as a primary agricultural activity - 29% of the parcels in the ALR. Extensive livestock operations include horses, beef cattle, dairy cattle, sheep and goats, llamas, donkeys, game, ratites (ostriches and emus) and free-range chickens. A parcel was counted as an extensive livestock operation if structures such as barns, paddocks and manure storage facilities were present in addition to the animals.

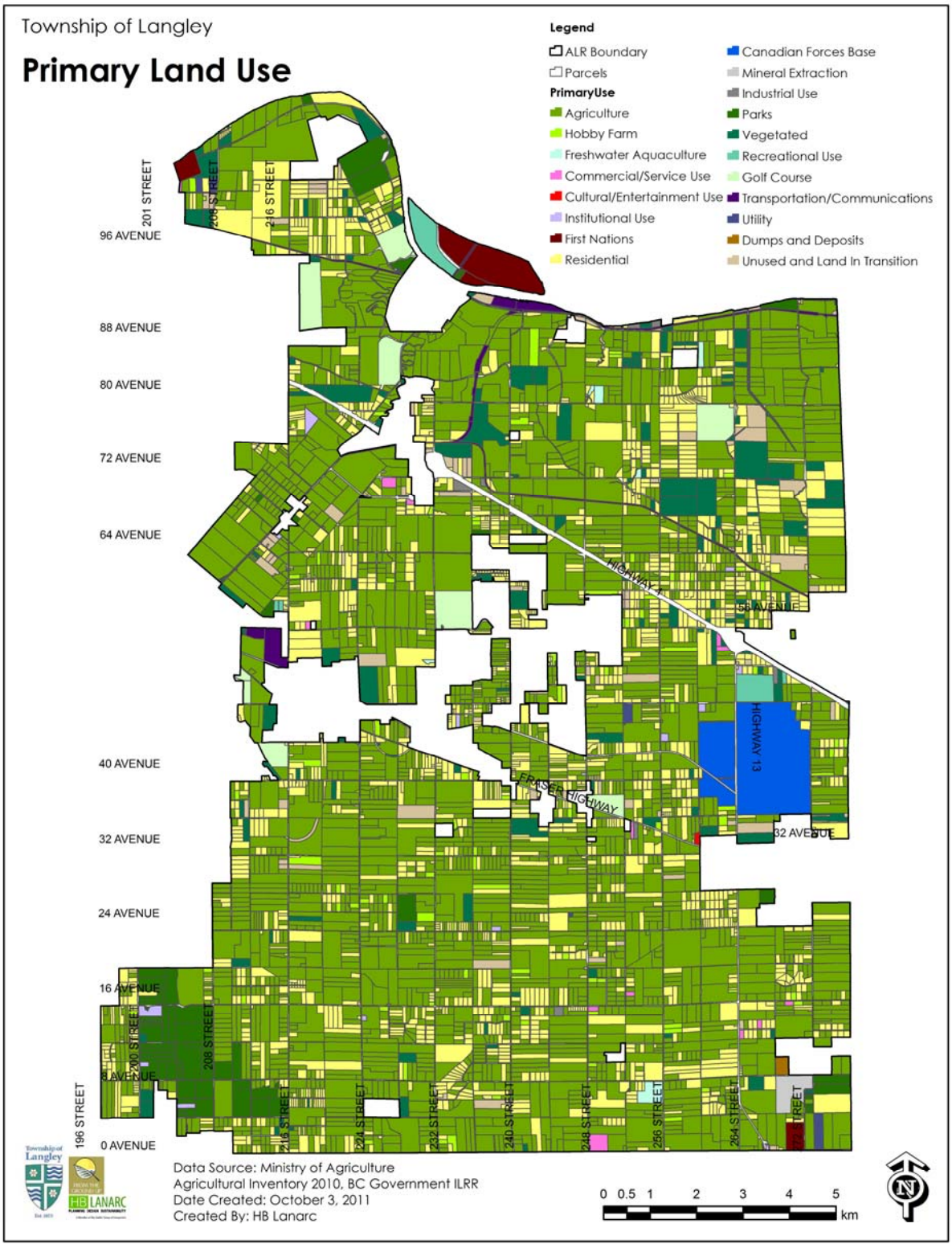


Figure 18. Primary Land Use, 2010

Table 9. Land Use Activity and Description

Land Use Activity	Description
Agriculture	Property with agricultural activity generating product(s) for sale, e.g., beef operation, nursery, vegetable production
Commercial/Service Use	Store, gas station
Cultural/Entertainment Use	Zoo, museum
Freshwater aquaculture	Hatchery
Golf Course	
Hobby – Amenity Use	Property with agricultural activity, but for amenity use only, i.e. no indication of farm products for sale (e.g., residential property with 1 horse)
First Nations	
Industrial Use	Wood processing plant
Institutional Use	School, church
Land in Transition	Construction site, tree removal
Canada Forces Base	
Mineral extraction	Gravel pit
Mobile Home Park	RV & Mobile Home Park
Not in use	Natural state (e.g. wooded area, trees, wetland, riparian, ravine)
Park	Officially designated green space for public use
Recreational Use	Trails, running track
Residential Use	Home or mobile home. Classified as Primary Activity when house (plus pool and garage etc.) = 25% of the total property area
Residential Use – Multi-family	Apartment, townhouse
Storage Yard	Junkyard, car/truck storage
Transportation and communication	Airport, road right-of-way
Unused farmland	Abandoned pasture
Utility	Power lines, pump house
Vacant	Neglected property that has signs of previous urban use, e.g., signs of demolished buildings
Water Management	Majority of area consists of watercourse(s)/ water body, shoreline, dyke
Wildlife Area	Designated wildlife area, e.g. bird sanctuary, habitat protection area, wildlife rehabilitation centre, wildlife management area

(Source: BC Ministry of Agriculture, Food and Fisheries, 2004)

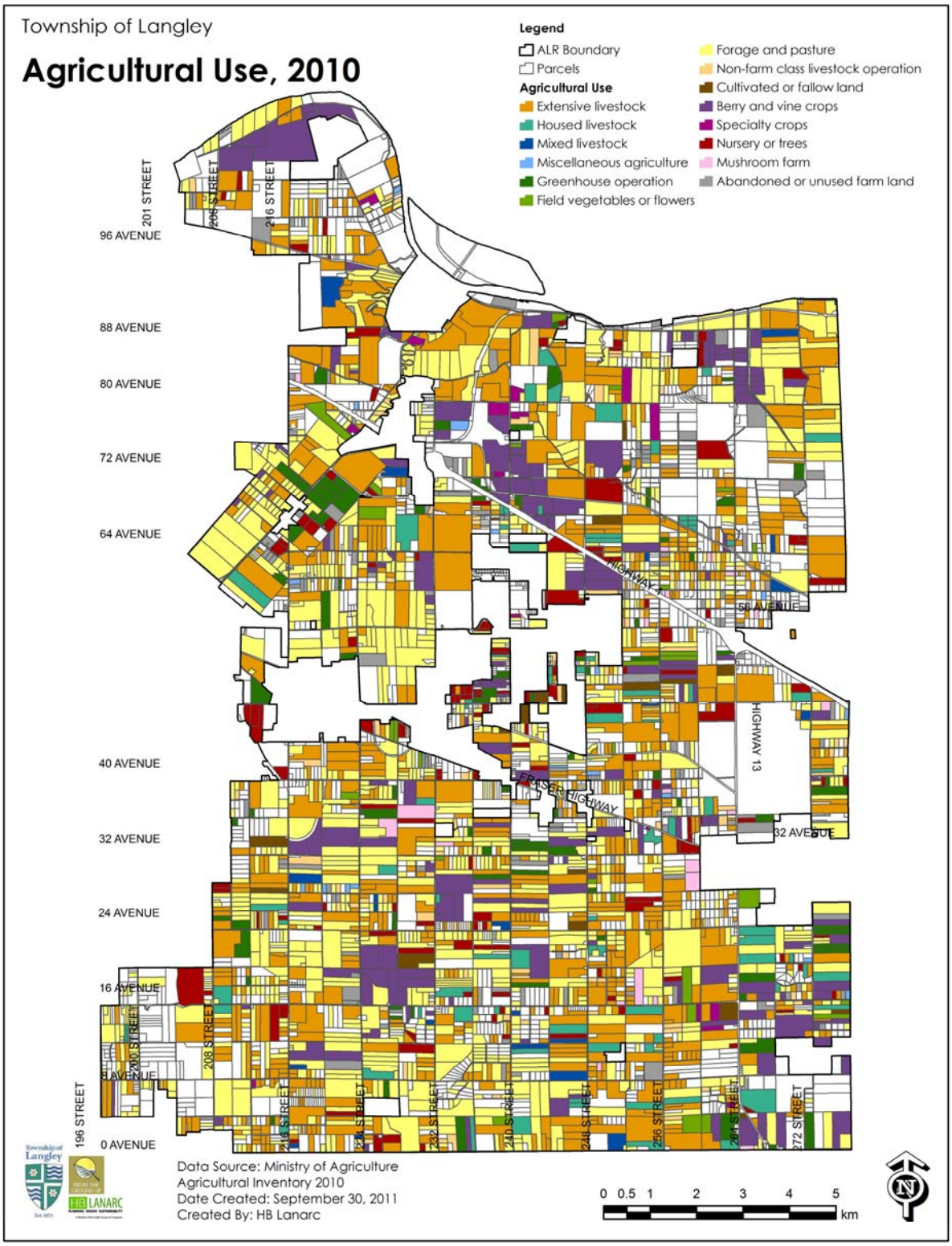


Figure 19. Agricultural Use, 2010

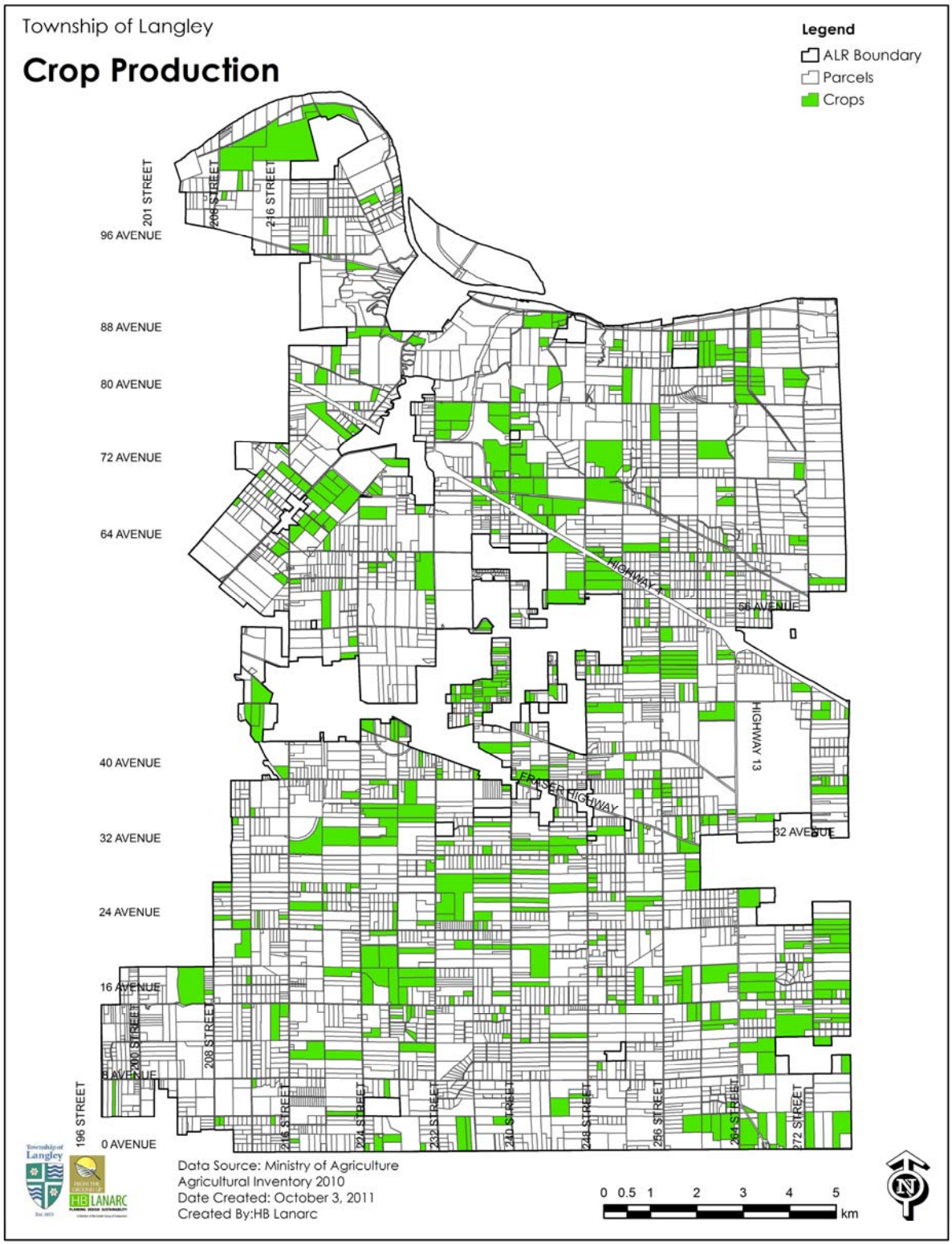


Figure 20. Areas of Crop Production, 2010

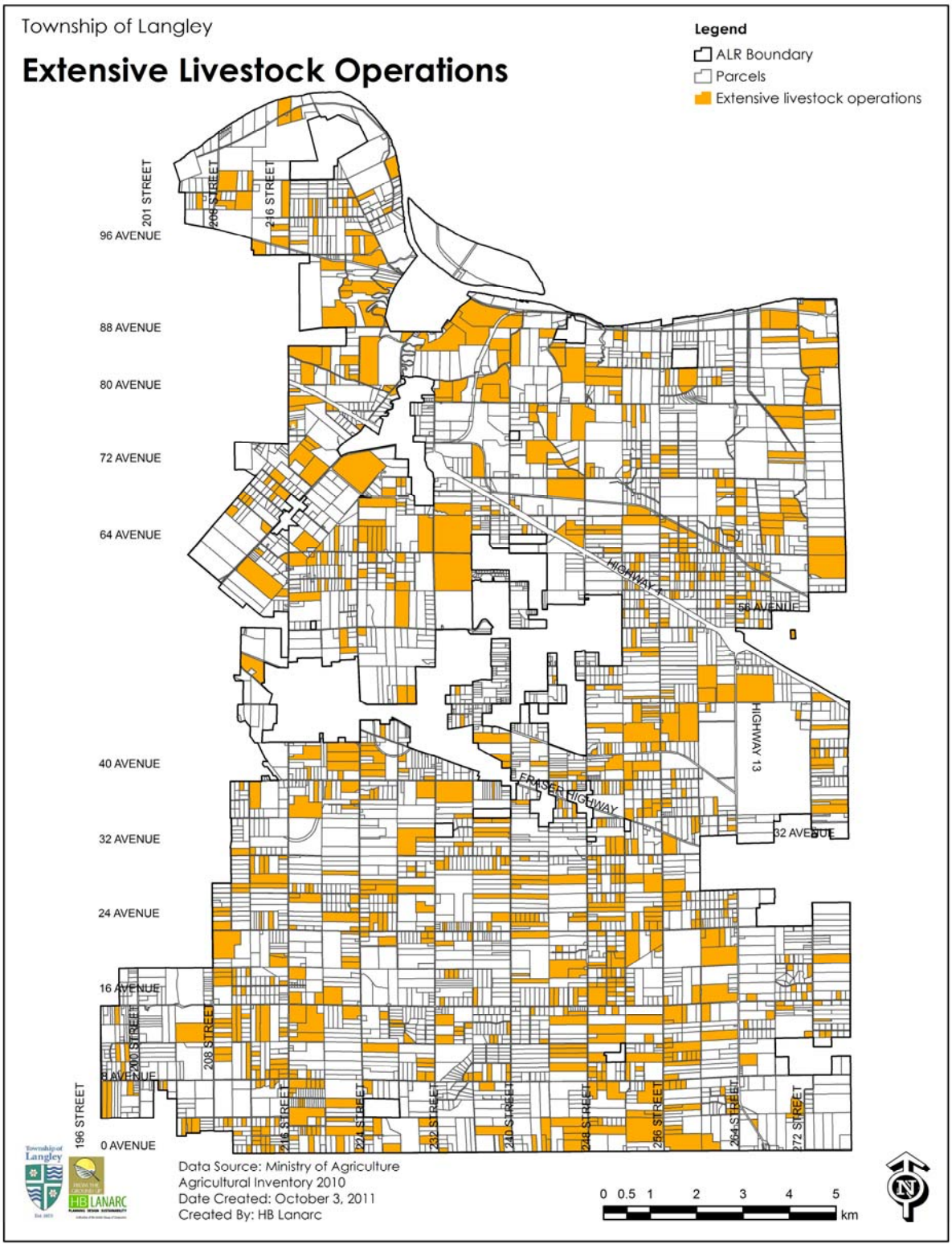


Figure 21. Extensive Livestock Operations, 2010

7.4. Potential Issues & Constraints to Farming

Figure 22 identifies parcels with agricultural potential that are not constrained by risk or factors of flood hazard and steep slope. Areas of natural or current agricultural practice are considered appropriate.

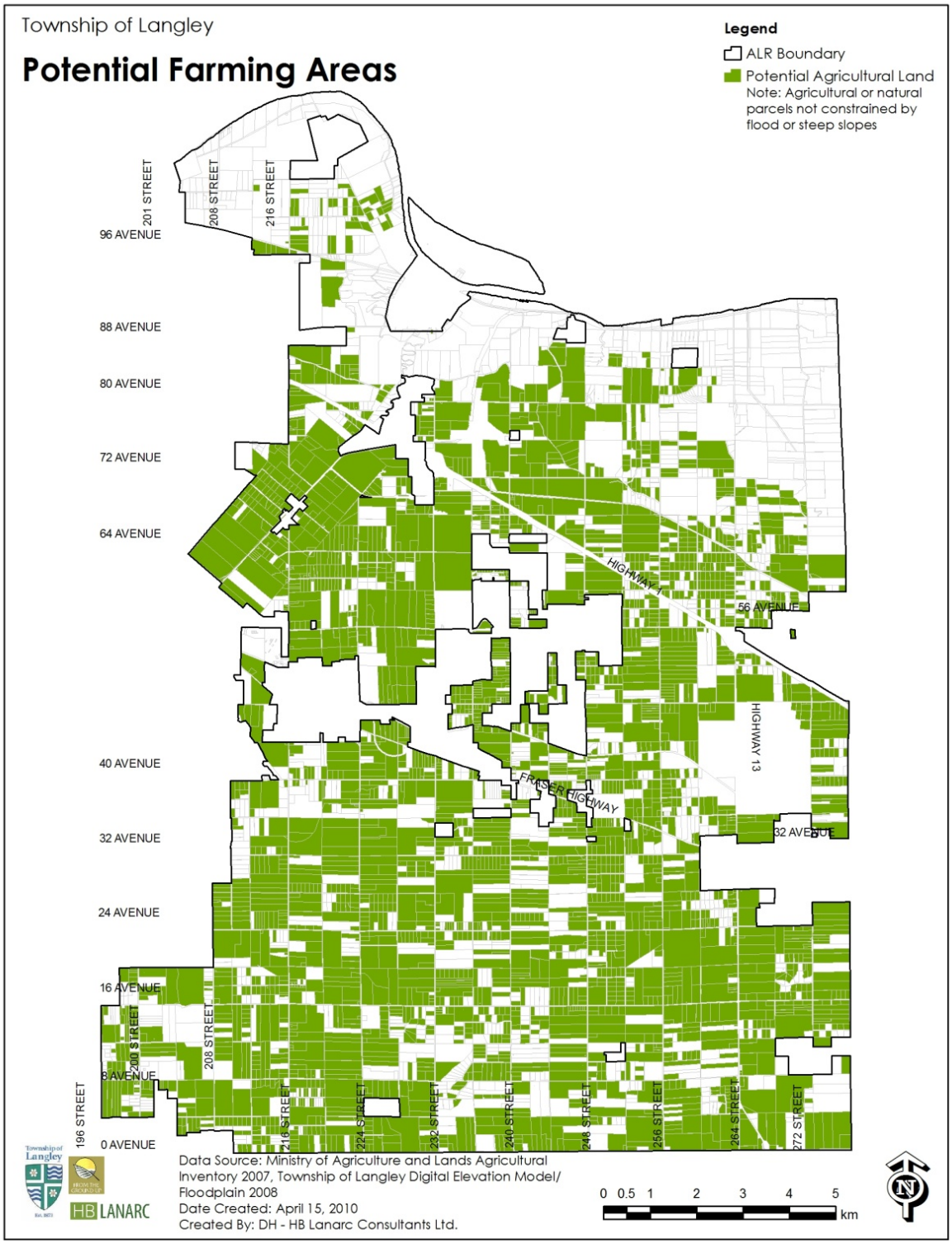


Figure 22. Potential Farming Areas

8. Farms and Farmers

8.1. ALR Parcelization

Langley is, and has long been, highly parcelized. Figure 23 classifies the parcels of the Township of Langley ALR by lot size: less than four hectares (10 acres); 4 to 8 hectares (10-20 acres); and greater than 8 hectares (20 acres). This data is summarized in Table 10. Ongoing population migration and second home development are transforming the rural landscape from one of agriculture and nature to one focused on recreation and retirement. This rural landscape transformation is characterized by the division of large tracts of land into smaller pieces and construction of second dwellings.

Table 10. Percentage Breakdown of Number of Parcels in Terms of Size

Smaller than 4 hectares (10 acres)	73%
4 to 8 hectares (10 - 20 acres)	13%
Greater than 8 hectares (20 acres)	14%

(Source: Township of Langley, 2006)

8.2. Farm Size

The average parcel size is 5.5 hectares (13.5 acres) with a minimum regulated size of 1.7 hectares (4.2 acres) and a maximum size of 97.8 hectares (241.7 acres). There are 1,213 parcels that are less than 1.7 hectares (4.2 acres), with an average size of 0.6 hectares (1.5 acres).

However, this issue is one that exceeds an examination of just average parcel size. Lot lines and parcel shapes have typically followed straight lines rather than geographical features such as watercourses, ravines, etc. The Township is divided into thousands of parcels by legal lot lines, watercourses, roads and natural features. Farming small parcels is generally inefficient as each farm has a base level of overhead costs and each one needs operational infrastructure such as a residence, outbuildings, equipment, etc. The more land is divided into smaller parcels; the more difficult it is to develop a viable farm due to these operational inefficiencies.

The challenge is to make the best of the existing division. There are certain types of agricultural operations that can be done on small parcels such as intensive organic market gardens, certain types of intensive housed livestock operations, greenhouse operations and nurseries. Developing policies that will encourage these types of operations on existing small lots could help to ensure that this land remains in agriculture and becomes more productive. It is worth noting that the number of small lot (less than 10 acre) farms has remained fairly static. It is suggested that long-term landowners, on these parcels, are not likely to suddenly develop a viable farm business. Changes in farm operation or increases in productivity on these parcels are most likely to happen when there is a change in ownership. Of course, that can't be forced upon people but programs could be developed to encourage new owners to start farming or to recruit new farmers to the area for that purpose.

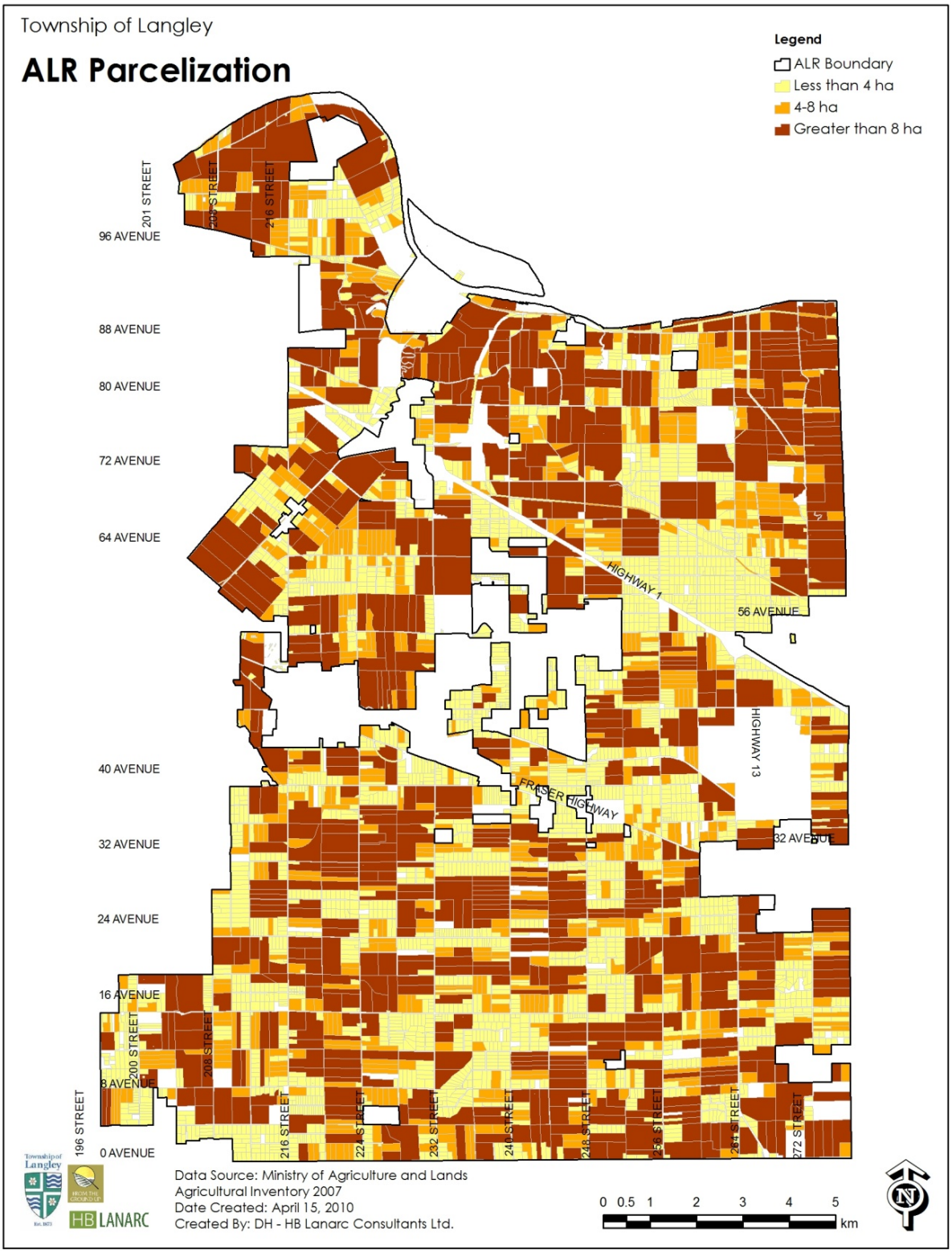


Figure 23. ALR Parcelization, 2007

8.3. Changes in Agricultural Activities

Figure 24 identifies 43 parcels where there was a major change in land use observed between the 2001 inventory and the 2007 Inventory. Most involved the removal of livestock, with 24 parcels being recognized as converting to a new agricultural use. Changes in land use tend to be towards activities that generate higher revenue per hectare, i.e. intensifying land use.

8.4. Parcels Adjacent to ALR Boundary

Figures 25 and 26 examine land use patterns along the ALR boundary. The information is important for discussion and planning along the agricultural/urban edge.

The Township of Langley has a complex ALR boundary. The ALR boundary is approximately 220 kilometres in length, with changing uses between adjacent parcels and incompatible uses between urban and rural neighbours. Edge planning for this boundary is supported by legislative tools contained in the Local Government Act which ensure greater land use compatibility. The planning process is being completed through coordinated and collaborative efforts involving the Langley Agricultural Advisory Committee and staff from the Municipality, BC Ministry of Agriculture (AGRI), and the Agricultural Land Commission.

Figure 25 shows that land use, along the urban/rural boundary, is dominated by agricultural operations, i.e. pasture and extensive livestock. These tend to be lower revenue generating operations. More intensive operations seem to be located away from the edge. These types of operations may be trying to avoid the inherent conflict of operating next to residential areas. The development of new intensive operations are not likely to occur along the edge where operators may be faced with added costs of dealing with perceived incompatibility in adjacent land use and conflict with adjacent owners. One solution could be designing policy along the edge to encourage preservation of the agricultural land, in a manner that provides a benefit to the urban neighbour, e.g., community gardens, linear parks, etc.

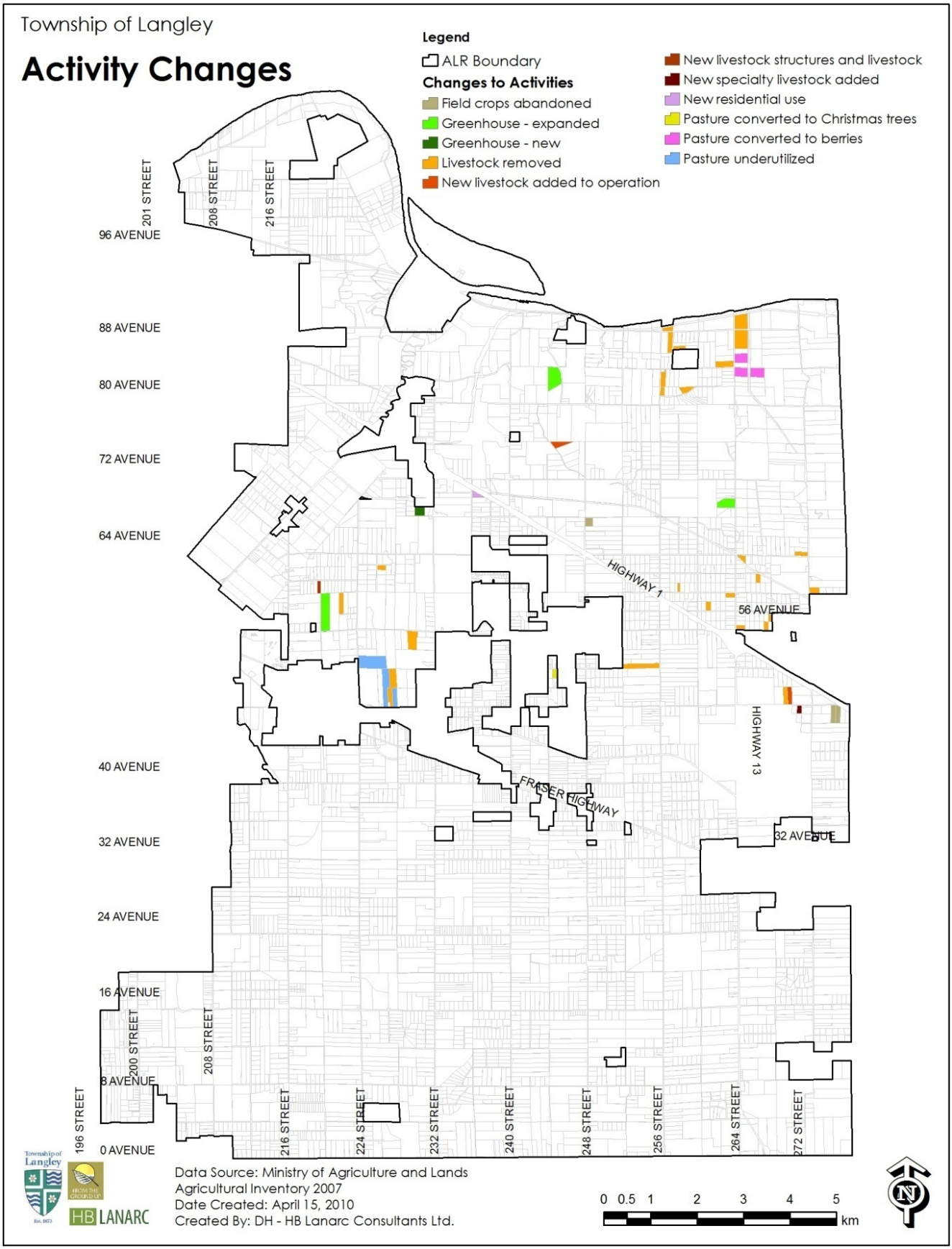


Figure 24. Activity Changes, 2007

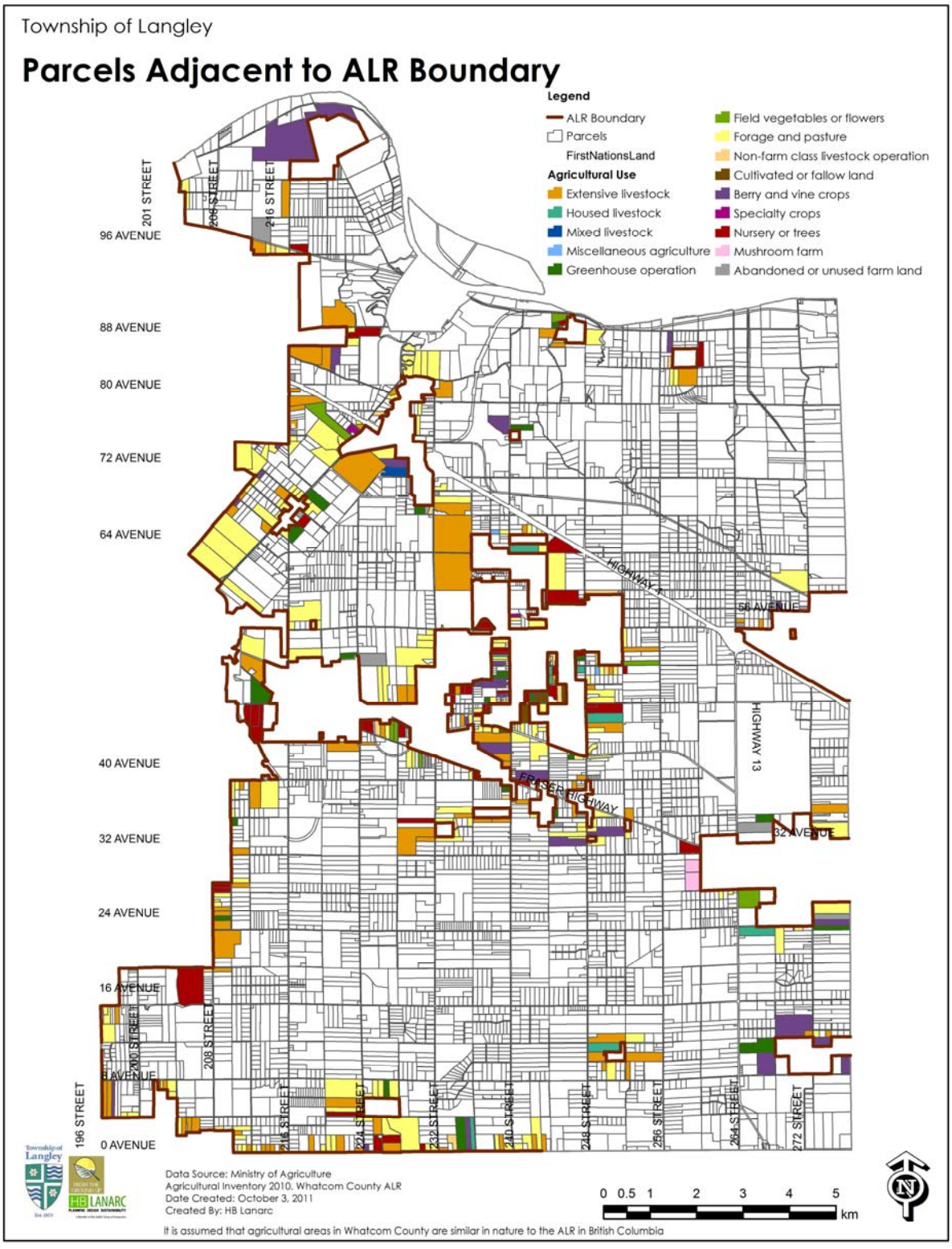
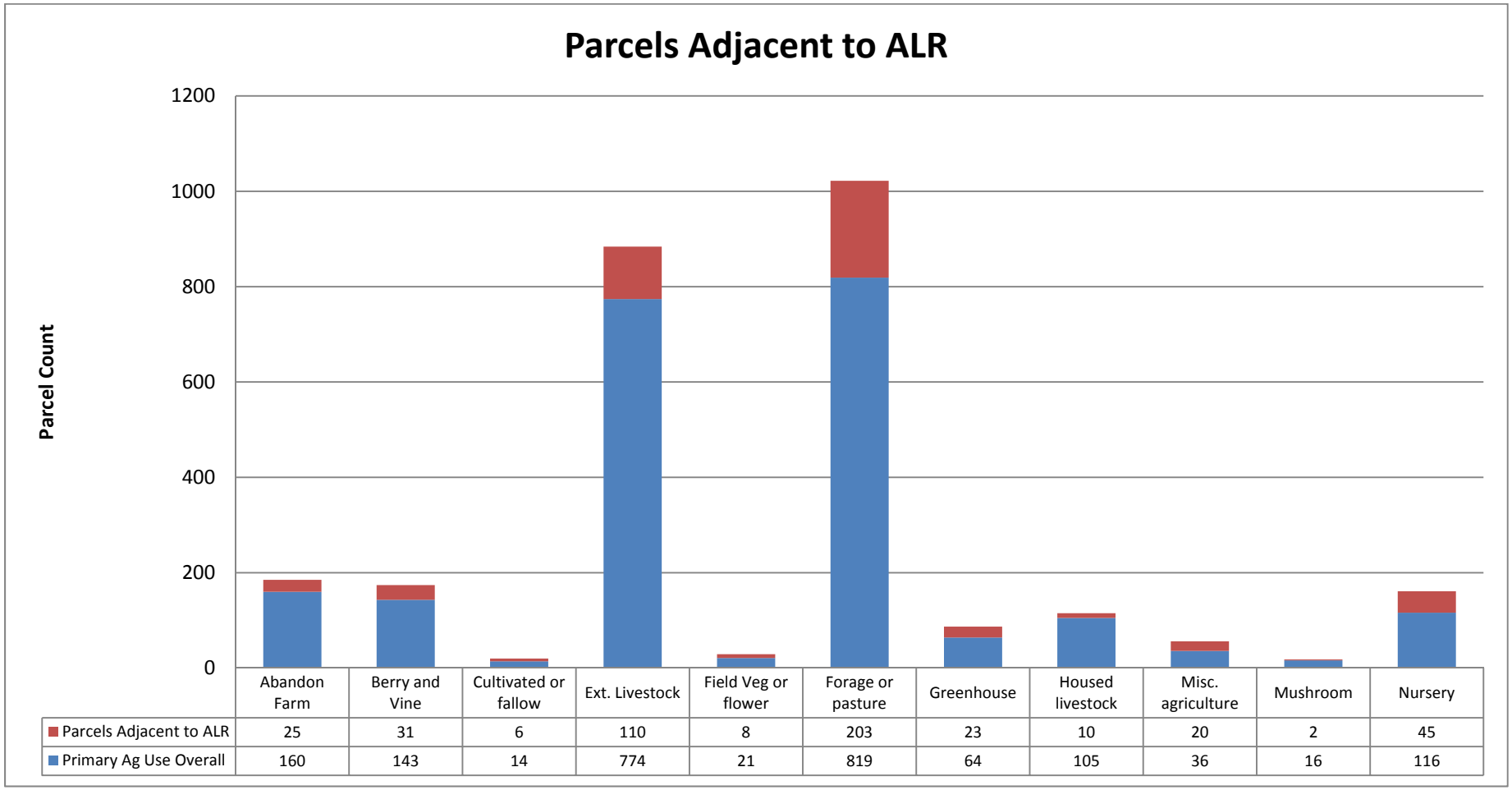


Figure 25. Parcels Adjacent to ALR Boundary, 2010



	Abandon Farm	Berry and Vine	Cultivated or fallow	Ext. Livestock	Field Veg or flower	Forage or pasture	Greenhouse	Housed livestock	Misc. agriculture	Mushroom	Nursery
Parcels Adjacent to ALR	25	31	6	110	8	203	23	10	20	2	45
Primary Ag Use Overall	160	143	14	774	21	819	64	105	36	16	116

Figure 26. Parcels Adjacent to ALR

9. Farm Economics

9.1. Economic Health of the Township's Agricultural Industry

9.1.1. Gross Farm Receipts

Gross Farm receipts in the Township of Langley have increased from $89.8 million in 1985 ($1984) to $228.4 million in 2006 ($2005) – a 20 year increase of 156%. The change of revenues is shown in Figure 27.

9.1.2. Total Operating Expenses

Total operating expenses have increased from $82.9 million in 1985 ($1984) or 92.31% of revenue to $209.7 million in 2006 ($2005) or 91.81% of revenue. Changes in operating expenses are also shown in Figure 27.

9.1.3. Net Operating Margin

The Net Operating Margin (Gross Farm Receipts minus Total Operating Expenses) has increased in dollar terms from $6.9 million in 1985 to $19.0 million in 2006. However, as shown in Figure 27, the percentage return has declined from 16.4% to 8.2%. Farmers are facing much tighter margins now than they were 20 years ago. They are generating more dollars but keeping less for themselves.

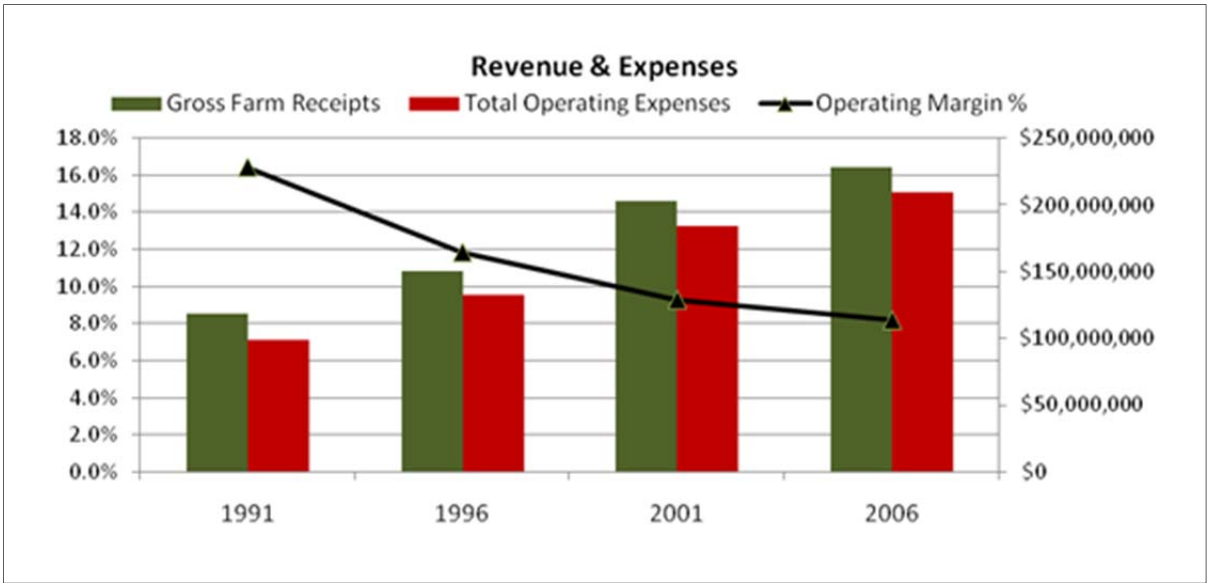


Figure 27. Change in Revenues and Expenses

9.1.4. Average Gross Receipts

Average gross receipts per farm have increased very significantly over the past 20 years – from $71,756 per farm in 1985 to $176,812 in 2005. Average gross farm receipts for the Township, Metro Vancouver, and British Columbia are shown in Table 11.

Table 11. Average Gross Farm Receipts: Local, Regional, and Provincial

	1985	1990	1995	2000	2005
Township of Langley	$71,756	$84,079	$94,922	$143,542	$176,812
Metro Vancouver	$92,340	$112,917	$143,892	$244,588	$278,306
British Columbia	$55,552	$68,723	$84,233	$113,736	$133,641

(Source: BC Ministry of Agriculture (AGRI) , 2006)

9.1.5. Revenue Intensity

Revenue per hectare has increased from $6743 in 1986 to $17,781 in 2006. With declining margins, and increasing land prices, farmers are forced to intensify their operations to maintain profitability.

9.1.6. Yearly Revenue for Selected Agricultural Uses

Figure 28 and Figure 29 are intended to demonstrate the relative contribution, in terms of revenue generation, of various types and scales of farm operation within the Township of Langley. These figures are not intended to imply an absolute amount of revenues for any individual business or sector. The revenue estimates are based on average returns per unit of production for the commodity produced at each location. Figure 28 represents the summary values reported from the map (Figure 29).

Housed Livestock (such as poultry) demonstrated the largest revenue contribution in the Township at estimated yearly revenue of $96,865,044. Nurseries and greenhouses are next with combined estimated yearly revenue of $58,167,357. Extensive livestock (livestock on pastures) is the most common use, occurring on 29% of the ALR parcels and with estimated yearly revenue of $38,333,475.

Non-soil based agricultural uses contributed significantly to revenue contributions for agricultural uses in the Township. It is anticipated that non-soil based agriculture will continue to increase in the future as soil based agricultural uses decline.

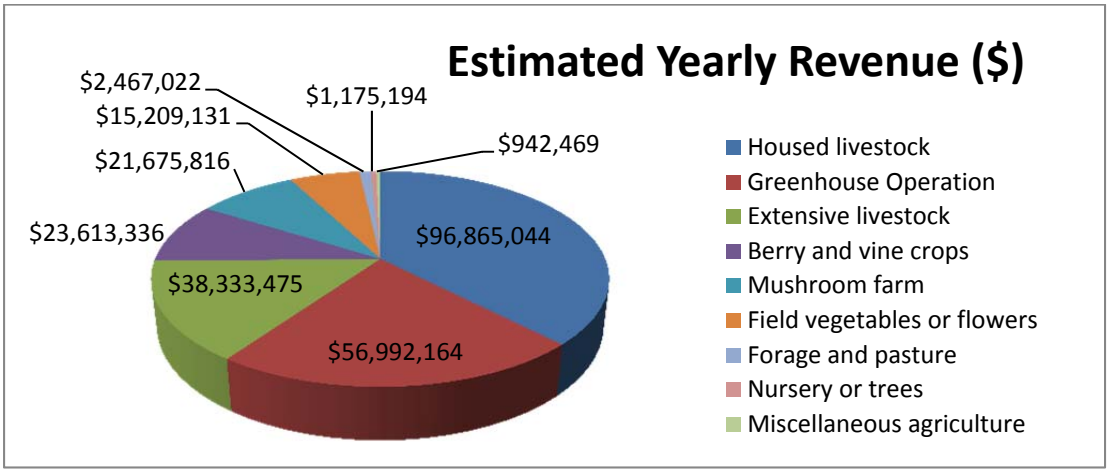


Figure 28. Estimated Yearly Revenue by Selected Agricultural Uses Summary

(Source: BC Ministry of Agriculture (AGRI), 2006)

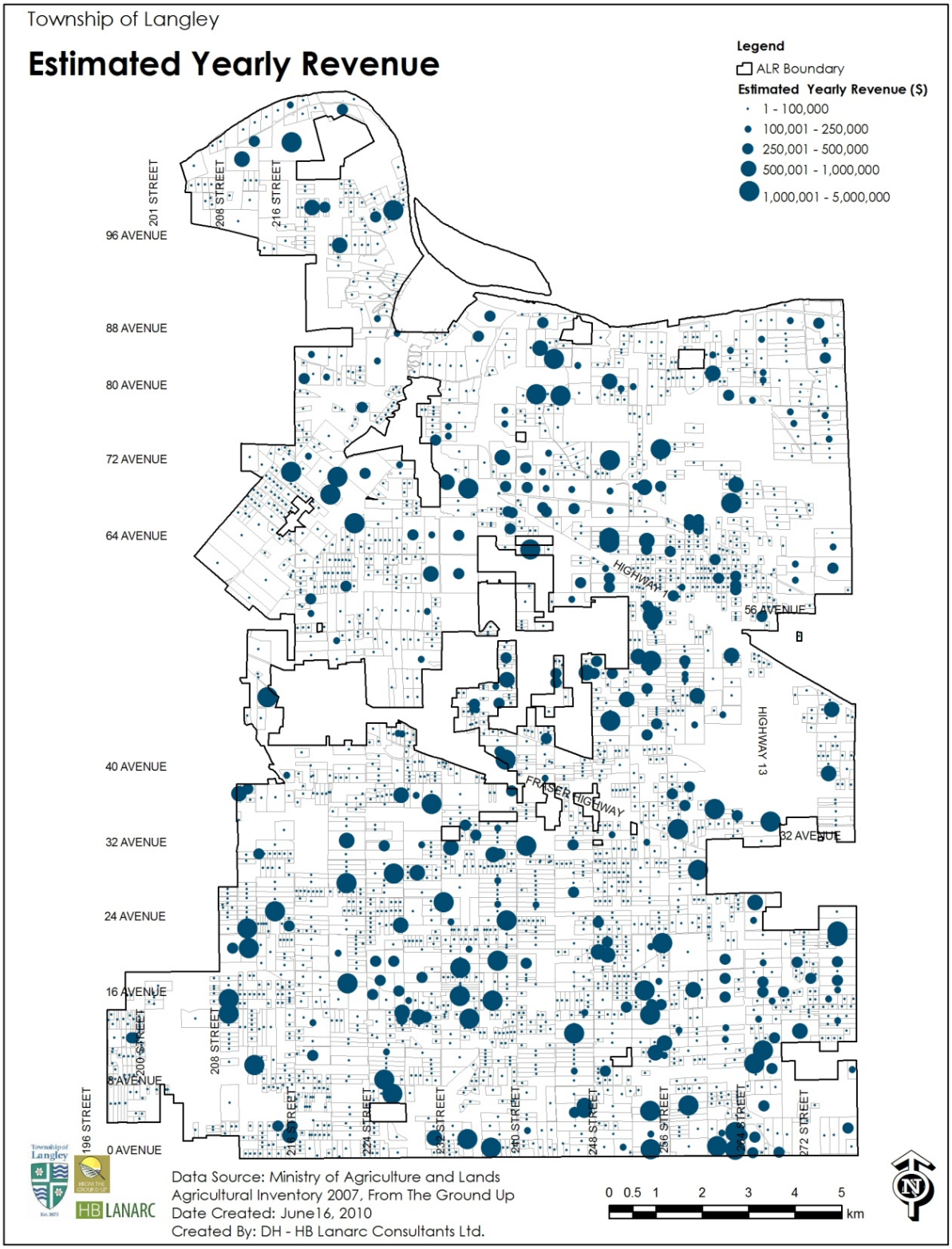


Figure 29. Estimated Yearly Revenue for Selected Agricultural Uses

9.2. Capital

9.2.1. Capital Investment

The capital value of farm assets in 2006 in the Township of Langley was $1.92 billion. This has increased from $1.24 billion in 2001 – an increase of almost 64%. Average capital per farm (2006) was $1,485,500. Land and buildings account for 93% of this capital investment. Farm machinery and equipment account for 5% and livestock and poultry, 2%.

9.2.2. Scale of Farm Operations

The variation in the scale of farm operations is shown in Figure 30. In 2005, 54% of the farms in the Township of Langley generated less than $10,000 per year in gross farm receipts. This percentage is fairly consistent with Metro Vancouver (48%) and British Columbia (48%). The percentage of farms with sales of less than $10,000 has remained fairly constant. Clearly, these farms are not focused on profitability.

At the other end of the scale, 18% of Langley's farms have sales of over $100,000. The number of farms in this category has increased.

The blue bars in Figure 30 indicate the number of farms generating revenue in the range listed on the horizontal axis. The points on the red line indicate the cumulative revenue generated by farms within each of those income ranges. Shown on the left, 695 farms (54% of the total number of farms) generate less than $4 million in gross farm receipts (2% of the total farm receipts). Shown on the far right, the largest 103 farms (less than 10% of the total farm numbers) generate about $170 million per year (about 74% of total farm receipts).

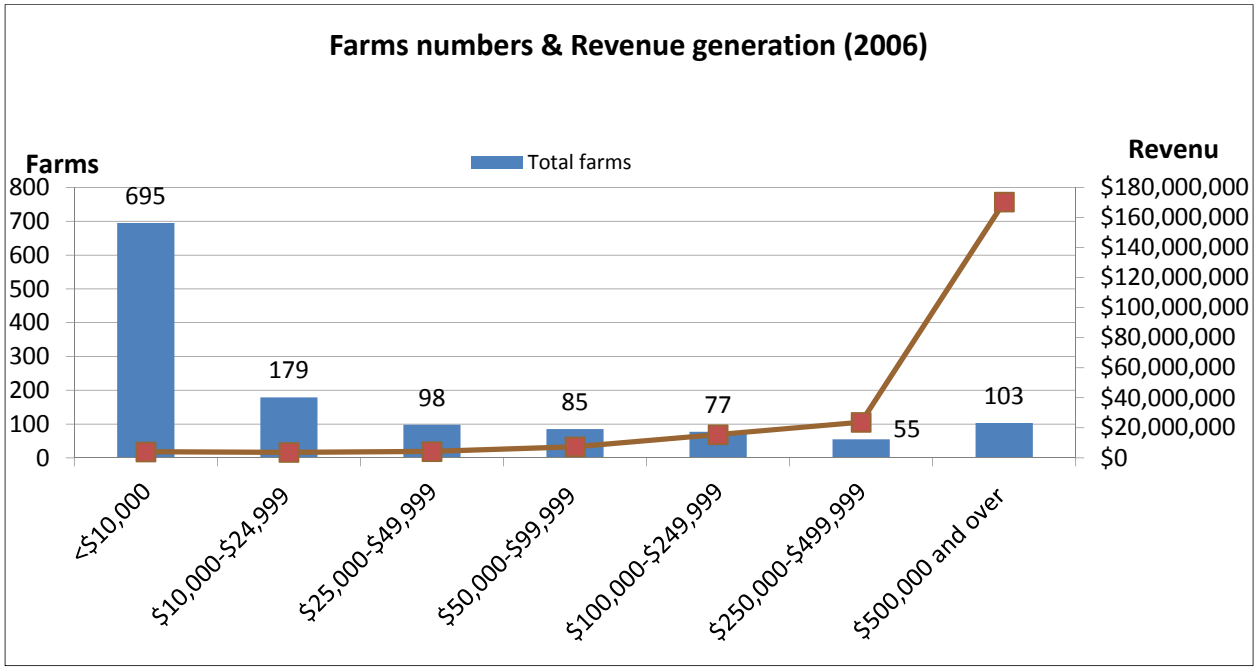


Figure 30. Farm Numbers & Revenue

(Source: BC Ministry of Agriculture (AGRI) , 2006)

Another important trend in this discussion is that the number of farms generating less than $25,000 per year has declined over the past 20 years – from 1,022 to 874. At the other end of the scale, the number of farms with sales of over $500,000 per year has increased from 64 to 103.

Industry averages for revenue generated per hectare (or per square meter in the case of greenhouses) were used in conjunction with farm area data (taken from aerial photographs) to identify the farms with large revenues. They are:

- Greenhouses and nurseries –at least 38 local greenhouses and nurseries are likely to be generating in excess of $500,000 per year;
- Intensive livestock operations, especially poultry –31 poultry operations are likely to be generating more than $500,000;
- Dairy operations –about 15 operations are likely to generate over $500,000 (these operations are harder to identify because they often occupy more than one parcel and size can't always be determined with air photos); and
- Larger berry operations –six berry operations are likely to fall in this revenue category.

Aside from dairy, large-scale farm operations do not require large land bases.

The data suggests that as the population and land prices increase, farmers may choose to do one of two things: move or intensify. Extensive livestock operations, which require larger land bases, tend to move further out into the rural areas where land is cheaper. Some well established family farms stay longer because of sentimental ties to the land (and some of these are on low lying lands which have less development pressure on them). Other farm operations intensify – produce more on less land in one form or another. In this case, the shift is towards greenhouse, nursery, and poultry production, all of which can produce very significant revenues on small land bases.

9.2.3. Farm Labour

Tables 12 and 13 summarize the wages and employment levels in the agriculture industry in the Township of Langley. In general, the wages paid in the industry are relatively low. Average cash wages are $532 per week. This is very close to the provincial average farm labour[1] of $520.

Paid farm labour weeks totalled 89,527. At the municipal level, the Township of Langley ranked second in the province. This included 66,861 weeks of year-round labour and 22,666 weeks of seasonal or temporary labour. This represents 29% of total paid labour weeks in Metro Vancouver or 10% in BC.

Seasonal field workers tend to be concentrated in the vegetable and berry sectors and shortages are common. All farms tend to require seasonal workers at the same time so there is a huge demand for a small pool of willing workers. A number of Fraser Valley farms have made use of the Seasonal Agricultural Workers Program to access unskilled foreign labourers to help fill this gap. The Seasonal Agricultural Worker Program matches workers from Mexico and the Caribbean countries with Canadian farmers who need temporary support during planting and harvesting seasons, when qualified Canadians or permanent residents are not available.

[1] Agriculture workers earned an average hourly wage of $12.69, about two-thirds as much as the average for all industries. Farm workers typically spent just over 41 hours on the job each week. http://www.guidetobceconomy.org/major_industries/agriculture.htm

Table 12.Agricultural Wages in the Township of Langley

Wages	Farms	Wages	Trend
Total Cash Wages	481	$47,673,547	Up 16% in 5 years
Wages paid to family members	264	$13,878,410	Up 24% in 5 years
Wages paid to all other persons	375	$33,795,137	Up 13% in 5 years

(Source: Statistics Canada, 2006)

Table 13. Agricultural Employment in the Township of Langley

Quantity of Labour	Farms	Weeks (FTEs)	Trend
Total Paid Labour	481	89,527 (1791)	Up 20% in 5 years
Paid Labour yearly	268	66,861 (1337)	Up 32% in 5 years
Paid Labour seasonal or temporary	289	22,666 (453)	Down 7% in 5 years

(Source: Statistics Canada, 2006)

Statistics are not available by sector within the local agriculture industry.

9.2.4. Land Value Assessments

Figure 31 categorizes the assessed land value in 2007 of each parcel. The mean value of assessed land value is $471,564. The assessed land is classified into four ranges of values:

- 36% of ALR parcels have land value assessment from $ 0 to $100,000;
- 18% of parcels have land value assessment from $100,000 to $500,000;
- 44% of parcels have land value assessment from $500,000 to $ 1,000,000; and
- 3% of parcels have land value assessment of $ 1,000,000 or more.

The Assessment Act requires the total assessed value be split between land and improvements. The total is derived from market evidence, and the allocation is based on the sales of similar, but vacant, lots. Any difference is assumed a result of the contributory value of the improvements.

Note for Land Value Assessment: Land for assessment purposes includes the normal definition of land, plus land covered by water. The allocation between land and improvements does not affect the amount of taxes paid for a single-family residential property. Therefore, changing the allocation will not usually change the amount of taxes payable. The total value (for land and improvements) must be reduced to reduce the taxes. If one is only appealing land or improvements, the Board is required to consider the total value as well as the split between the two.

Information regard farm value assessment and tax reduction is detailed in the Policy Framework portions of this report as it pertains to Provincial Farm Classification and BC Assessment.

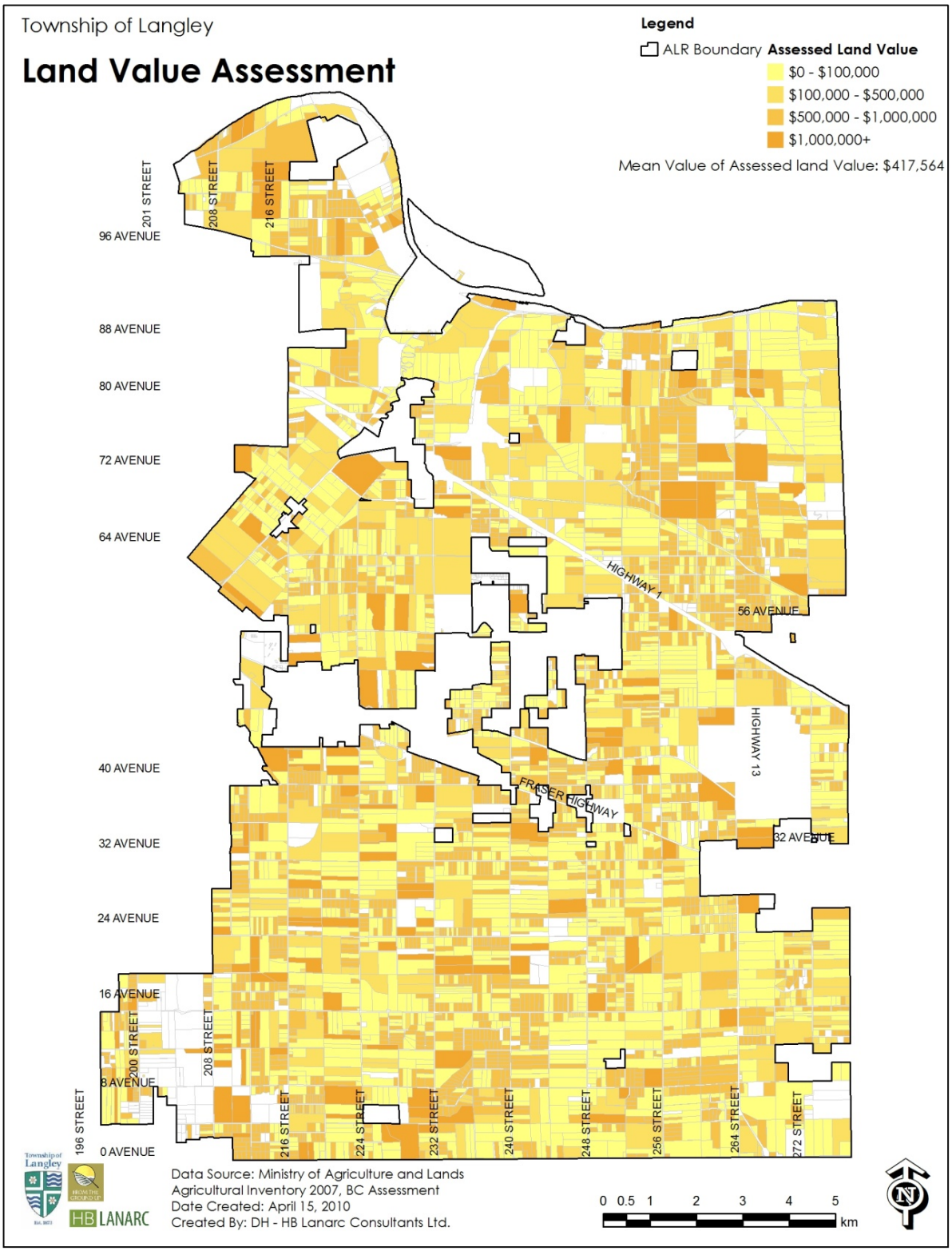


Figure 31. Land Value Assessment, 2007

9.2.5. Assessed Value of Improvements

Figure 32 categorizes the value of assessed improvement to land values in 2007 for each parcel. This is classified into four ranges of values:

- 8% of the ALR parcels have assessed improvement values between $0 and $100,000;
- 74% of the parcels have values between $100,000 and $500,000;
- 6% of parcels have assessed improvement value between $500,000 and $1,000,000; and
- 1% of parcels have $1,000,000 or more assessed improvement value.

The total assessed value of farm improvements in the Township of Langley is $ 964,779,400 with the mean value of assessed improvements being $222,842 per parcel. According to the 2006 Agricultural Census, the total value of farm capital in the Township of Langley was $1.92 billion. This has increased almost 55%, from $1.24 billion, in 2001. This has been attributed to increases in the value of land and buildings.

Note for Assessment Value of Improvements: For assessment purposes, improvements generally refer to any building, fixture, or structure placed on land, or water over land. It is possible for the improvement value to increase one year over another even if it has not been altered or renovated, since it is the contributory value of the improvements to the total property value that is estimated.

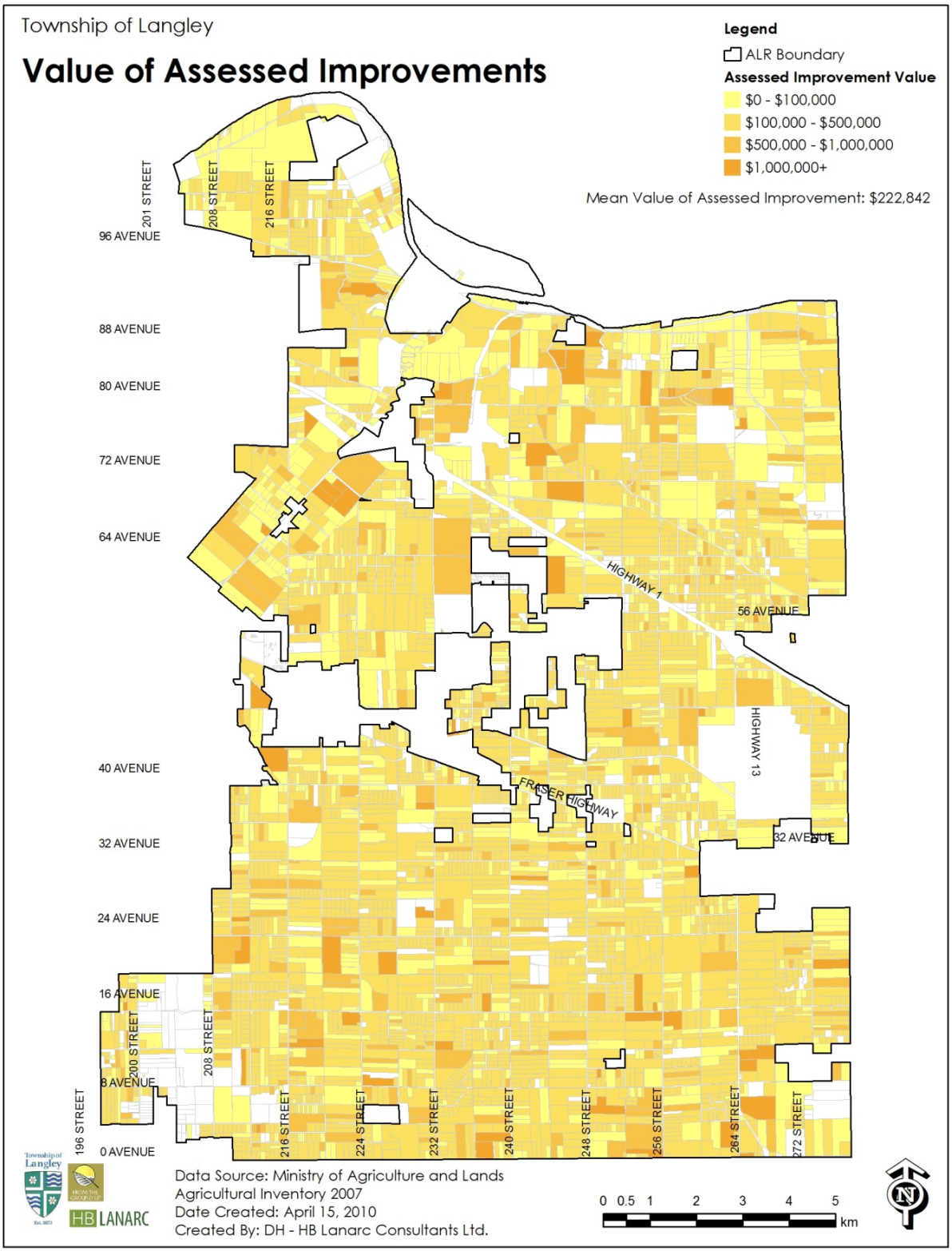


Figure 32. Value of Assessed Improvements, 2007

9.3. Trends in Agricultural Land Use

This section describes a number of trends observed while analyzing the inventory and Census data to compile the initial land use inventory for the Township of Langley.

9.3.1. General Trends

The "Agricultural Overview" of the 2006 Census for the Township of Langley compares a wide variety of data over 20 years. Significant trends identified in this report include the following:

- Total area farmed has declined from 13,322 hectares (32,919 acres) in 1986 to 12,970 hectares (32,049 acres) in 2006 (about 2.7%).
- The area farmed is reported in five categories: crops, summer fallow, pasture (managed), pasture (unmanaged), and other. "Other" includes unimproved land, other improved land and woodland. Of the five categories, there are three significant changes in reported land-use:
    - Area used for crops has increased from 5,062 hectares (12,508 acres) to 5,772 hectares (14,262 acres);
    - Managed pasture has declined from 2,749 hectares (6,792 acres) to 932 hectares (2,303 acres) - a substantial drop that does not appear to be reflected in a corresponding increase in the area reported as unmanaged pasture; and
    - "Other" land use has increased from 3,005 hectares (7,425 acres) to 3,727 hectares (9,209 acres).
- The number of farms was 1,252 in 1986. It peaked at 1,584 in 1996, and declined to 1,292 in 2006. Overall, the number of farms has increased 3.2% since 1986.
- Average farm size has dropped from 10.6 hectares (26.2 acres) to 10.0 hectares (24.7 acres). This is well below the Metro Vancouver average of 15.7 hectares (38.8 acres).
- Fruit, berry, and nut production has reportedly increased from 662 hectares (1,635 acres) to 762 hectares (1,882 acres) over the past four census periods (1991 to 2006). Blueberry production increased by 236 hectares (583 acres). This was offset by declines in apples, cherries, strawberries, raspberries, and slight changes in other fruit acreages.
- Over the same period vegetable production declined from 195 hectares (481 acres) to 127 hectares (313 acres).
- The number of certified organic farms has only been reported for the past two census periods. Certified organic farms increased from 10 to 17. Additional farms may have been certified since the 2006 census.
- The number of mushroom farms reporting has dropped by almost 50% from 36 to 17. However, with new spawning techniques, mushroom productivity has increased from 7 to 9 cycles (crops) on an average individual farm.
- Greenhouse production is up 244% from 31 hectares (77 acres) in 1991 to 77 hectares (190 acres) in 2006 (Figure 33. Greenhouse Production). This includes an increase of over 23 hectares (57 acres) in greenhouse flower production and almost 20 hectares (50 acres) in greenhouse vegetables.
- Poultry production has increased significantly over the past 20 years (Figure 34). All other livestock production, except horses, has declined. The number of dairy animals reported has dropped from 3896 milk cows in 1996 to 2986 in 2006. Farms reporting dairy have declined from 82 to 41 over the same period.
- The area irrigated has increased from 1,090 hectares (2,693 acres) to 1,202 hectares (2,790 acres).

- Total gross farm receipts have increased from $118,383,062 in 1991 ($1990) to $228,440,789 ($2005) in 2006. However, total operating expenses and wages increase from $80,066,348 to $209,734,952 (Figure 35). This leaves net operating income of $38.3 million in 1991 (7.6% of gross) and $18.7 million in 2005 (8.2% of gross).
- Average gross receipts per farm have increased from $71,756 in 1985 to $176,812 in 2005.

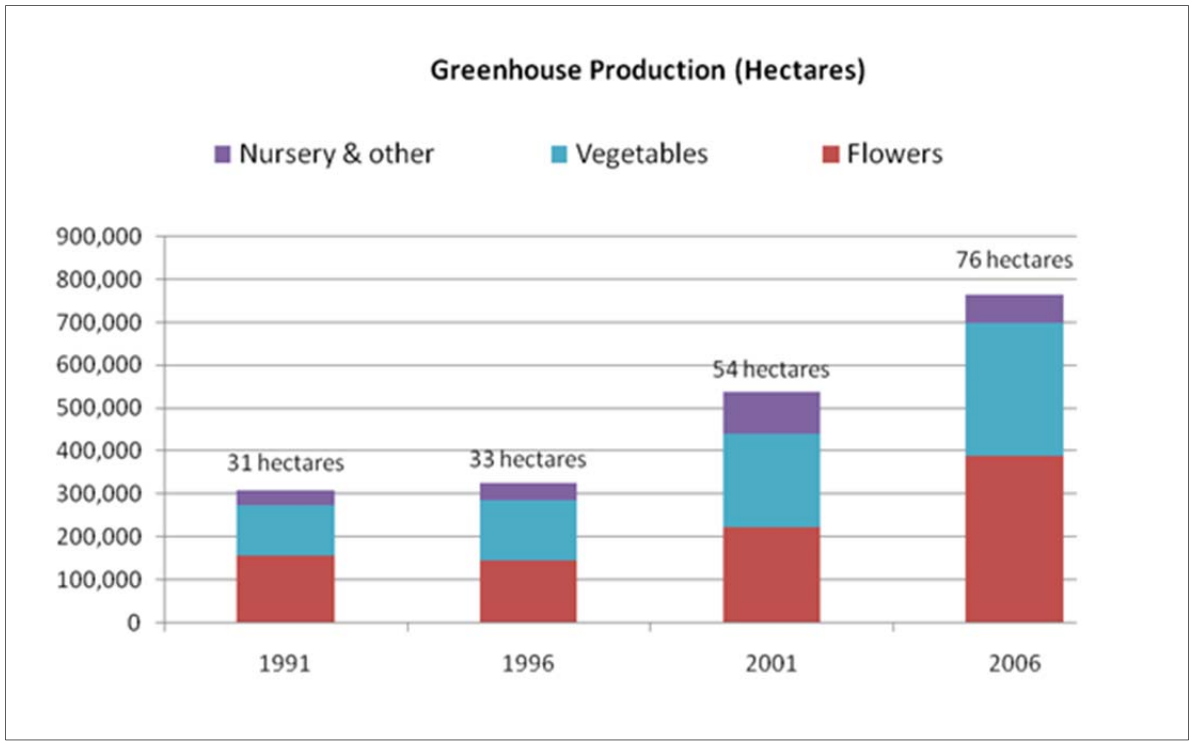


Figure 33. Greenhouse Production

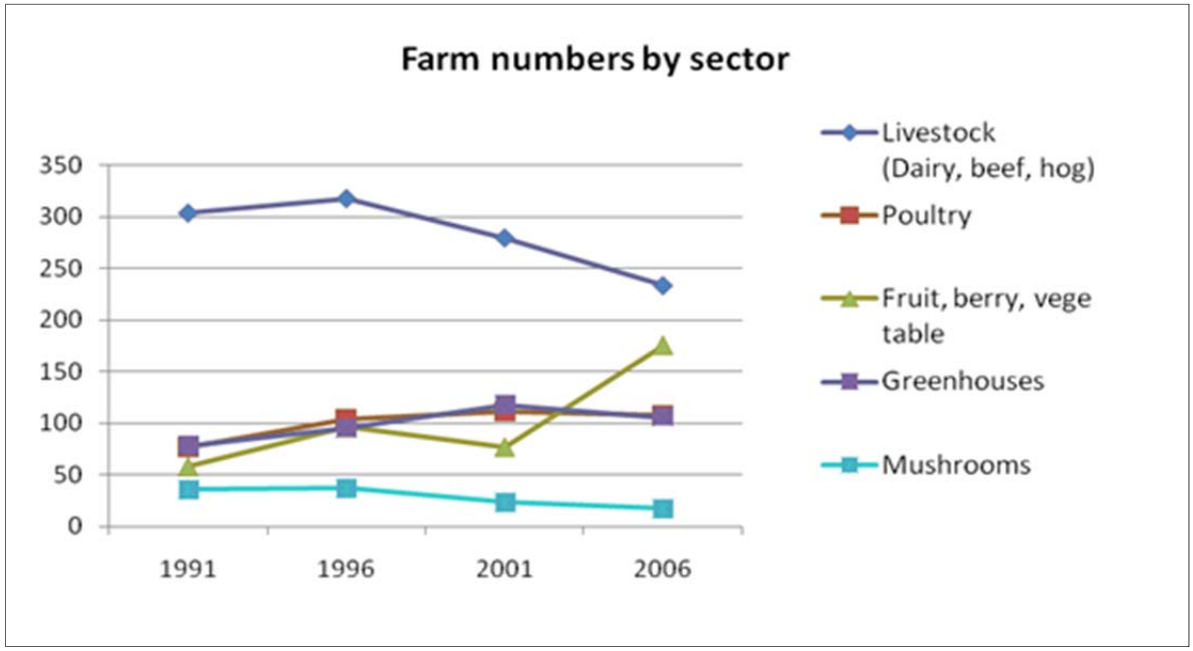


Figure 34. Farm Numbers by Sector

9.3.2. Net Operating Margin

The Net Operating Margin (Gross Farm Receipts minus Total Operating Expenses) has increased in dollar terms from $6.9 million (7.6% of gross) in 1985 to $19.0 million (8.2% of gross) in 2005. Operating margins soared to $38.3 million in 1990 and even higher to $49.9 million in 1995 before dropping back down to current levels of less than $20 million. The operating margin in percentage terms rose from 7.6% in 1985 to the 33% range in the 90's and then dropped below 10% for the past two census periods. Operating margins below 10% are common in Canadian agriculture.

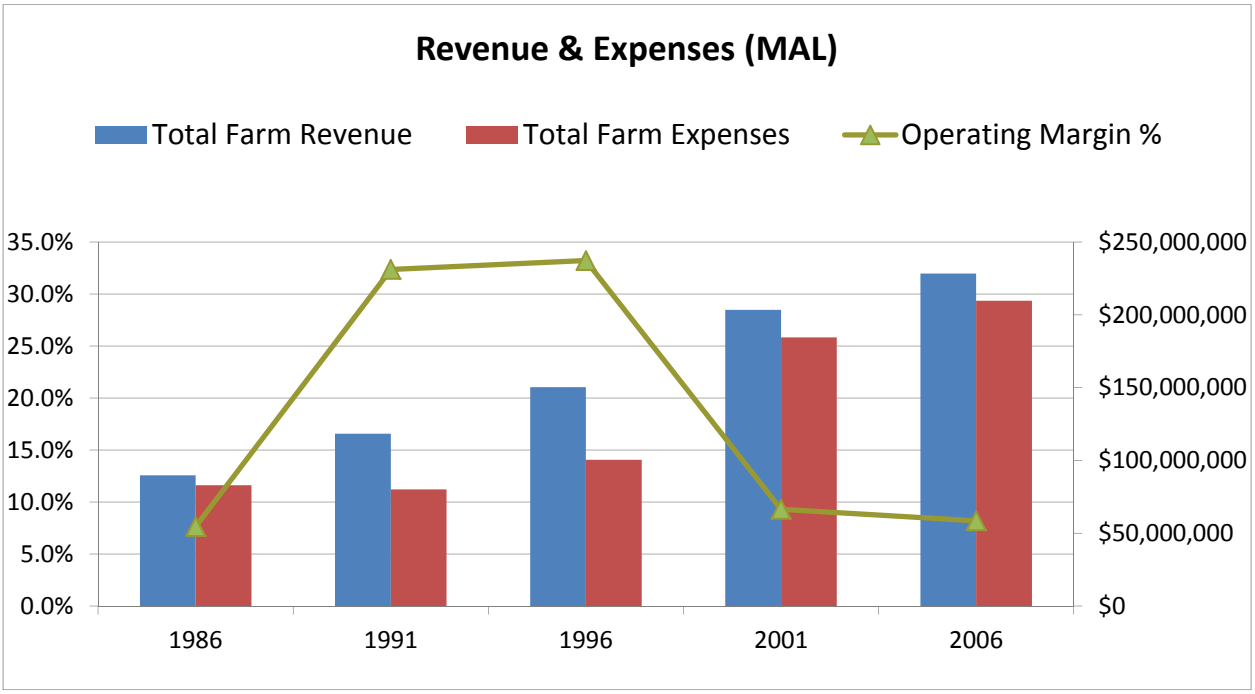


Figure 35. Revenue & Expenses

9.3.3. Trends Based on Detailed Review of Census and Land Use

A number of trends and observations have been made based on a detailed review and analysis of the census data and land use inventory information. The following trends and observations are important to the planning process and to developing a viability strategy for agriculture in the Township of Langley. These are based on a detailed review and analysis of the census data and land use inventory information.

Economic Contribution - The economic contribution of the agriculture industry in the Township of Langley has increased significantly over the past 20 years. Revenue generated by the industry has increased from $89.8 million in 1985 to $228.4 million in 2005. Capital investment has increased from $409 million in 1985 to $1.92 billion in 2005.

Significant shift in production - There have been a number of very significant shifts in the types of agricultural production. The livestock industry has been steadily declining, except for poultry. Livestock production generally requires a larger land base. As land prices increase, livestock production has moved further inland. Poultry production has not shifted as dramatically because the land-based requirements

are smaller. Hog production has disappeared completely due to high feed costs; it has moved to the Prairie Provinces where feed costs and land prices are much lower. The livestock operations that remain are generally producing more volume, i.e. farm numbers are declining while production per farm is increasing. Intensive livestock has been replaced with intensive horticulture. Nursery operations occupied 410 ha in 2006, up from 260 ha in 1991. Greenhouse area increased from 313,702 m² in 1991 to 766,273 m² in 2006. The area in berries has also increased significantly.

9.3.4. Organic Farming

According to the 2006 Census, there were 17 certified organic farmers in the Township of Langley, compared to 10 in 2001. Many small farms use organic production methods but do not undergo certification due to the cost. Organic certification standards have changed in recent years. A new set of federal standards has been developed to be more consistent with the American standards. These new standards replace the standards that had been adopted in most provinces. Consumers purchasing "certified organic" product can now be more certain that it has been produced according to a well-defined set of practices throughout North America.

Based on comments from farmers who direct-market their product, consumers seem to be more concerned with pesticide use than they are with the use of chemical fertilizers. In response to that attitude, many farmers have reduced their use of pesticides while continuing to use chemical fertilizers. The census numbers show that chemical fertilizer is used on 21% of the cropped land. Herbicides are used on 9%, and insecticides and fungicides, which tend to be far more toxic than herbicides, are used on 5% of the crop land. In contrast, 31% of the cropland is fertilized with manure.

The demand for organic products is likely to continue to grow, which represents opportunities for increased production in the Township. However, producers need to identify how they will market their product at prices that justify the added cost of production and allow them to compete with large-scale organic producers in other geographic regions.

9.4. Processing

9.4.1. Regional Farmers Markets

Figure 36 shows the location and adjacency of popular regional farmers markets. These markets are often used for direct sale opportunities for agricultural producers. The patterns demonstrate that a majority of the farmers markets are located west of Langley in areas of higher urban density and population. Farmers markets represent very lucrative direct sales opportunities and have experienced significant growth over the last decade.

As of 2010, there are farmers markets every day of the week within the Lower Mainland. As such, farmers have an opportunity to bring their produce to market in a direct sales environment. Conceivably, this effort reduces overhead, and builds the famer-citizen connection. It is highly likely that direct sales opportunities such as farmers markets will continue into the future.

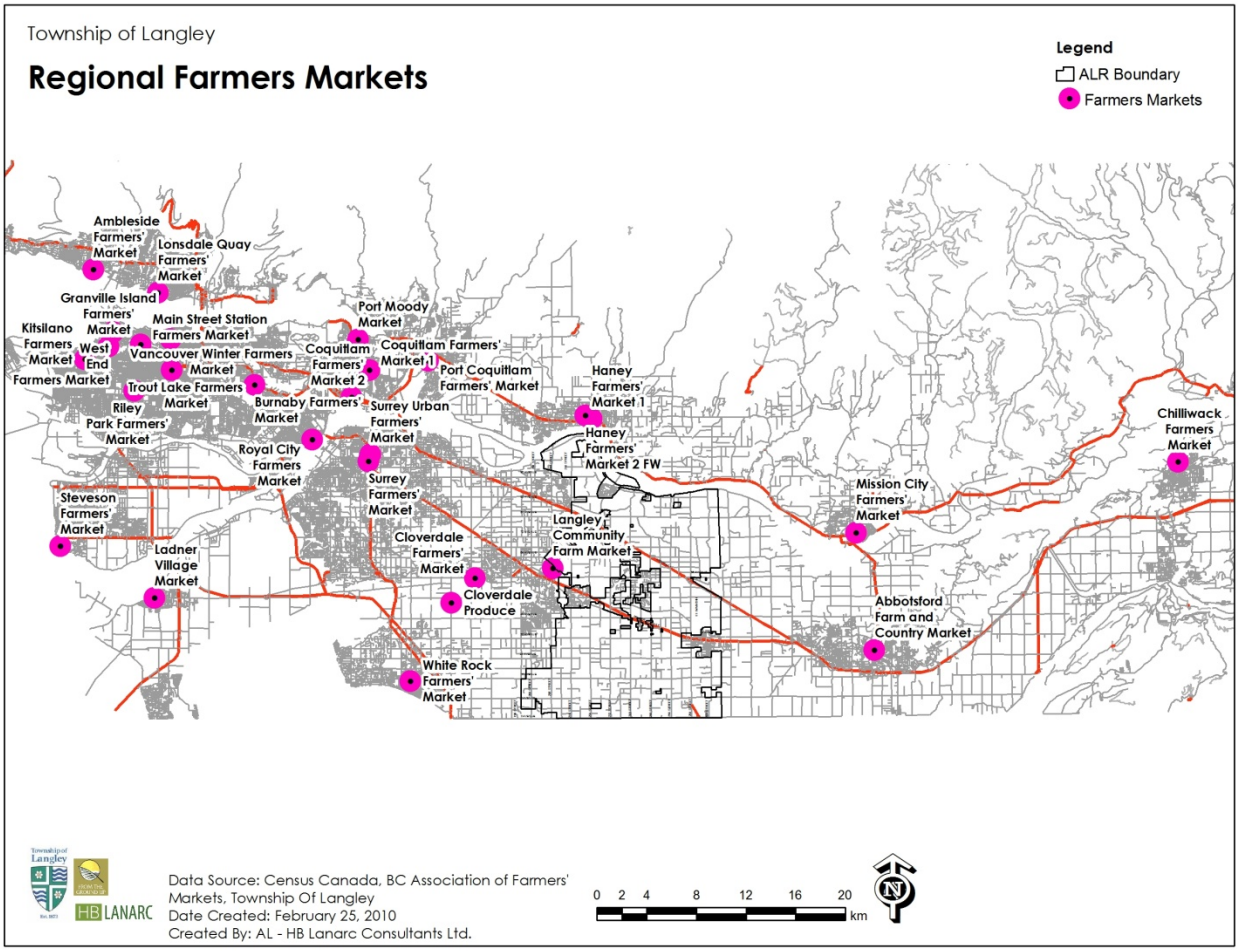


Figure 36. Regional Farmers Markets

9.4.2. On-Farm Processing

Figure 37 displays the location of parcels that operate value-added agricultural activity. 1% of the ALR parcels have value added agricultural activities. 57% of all these activities create products for sale. Adding value is the process of changing or transforming a product from its original state to a more valuable state. Value-added agriculture is an important component of sustainable rural development.

The 2007 inventory indicates that most value-added activity comes from direct farm product sales and marketing. Agri-tourism is also a significant value-added activity, as is seen by the agri-tourism destination map. Although data for the 2007 inventory appears to be incomplete in terms of reported value-added activities, the trends seem to support current assumptions.

Direct farm market operations and farmers market vendors have been experiencing double-digit increases in sales in recent years. A large part of this is the increasing trend for consumers to support local farmers, with actions such as the “100 Mile Diet."

9.4.3. Non-Farm Processing of Local Products

Figure 38 displays the location of identified agricultural processing operations as defined by Fraser Valley Farm Direct Marketing Association (FVFDMA). There are six processing sites in the Township of Langley. FVFDMA provides information to promote and develop the market for farmers selling direct to the consumer through value-added activities. Those operations that involved processing of raw product were selected and located for this map. Completeness is subject to the availability of data.

Production operations appear to take advantage of proximity to consumer markets and infrastructure for operations and transportation. There is a range of activities present including food product and wineries.

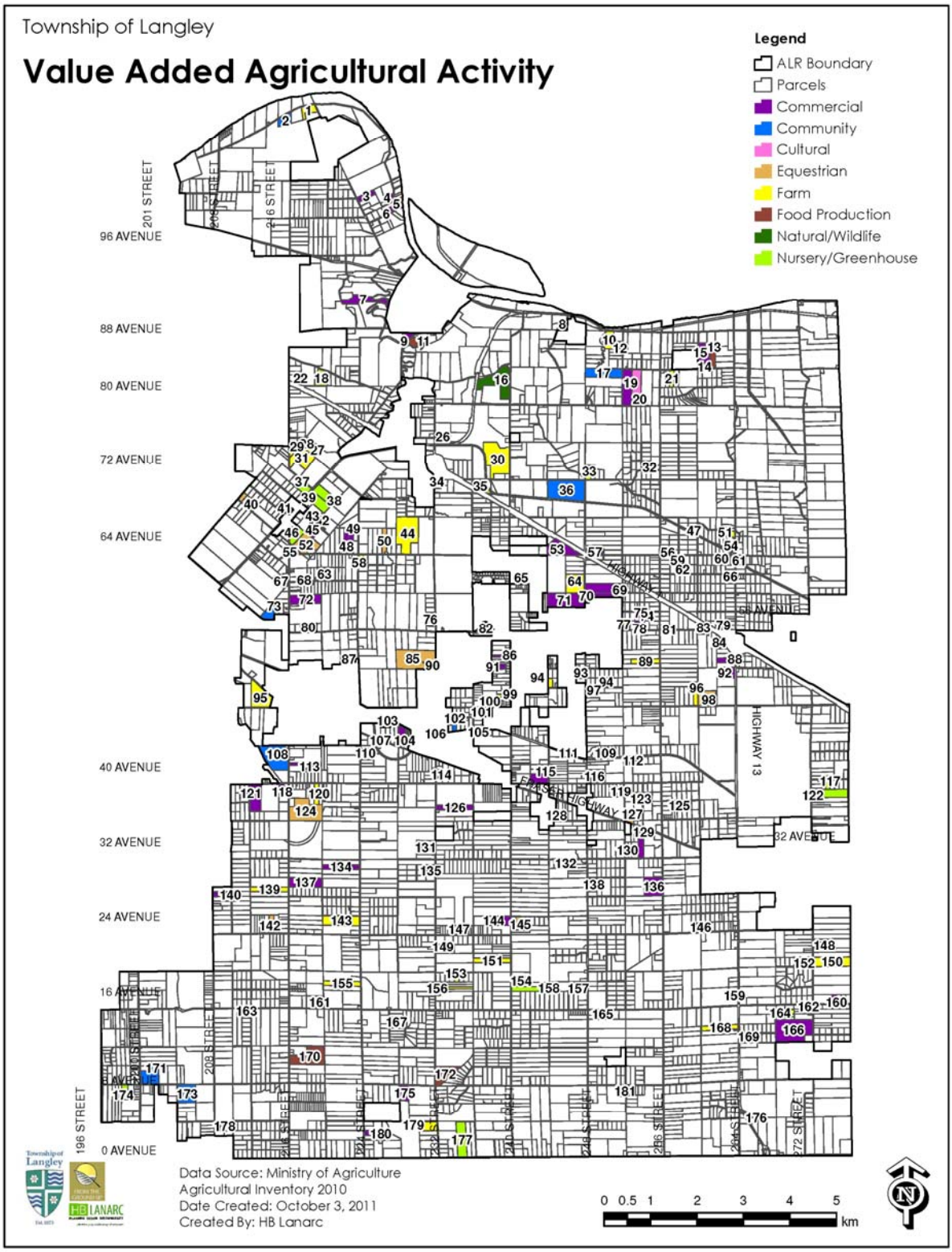


Figure 37. Value Added Marketing Activity

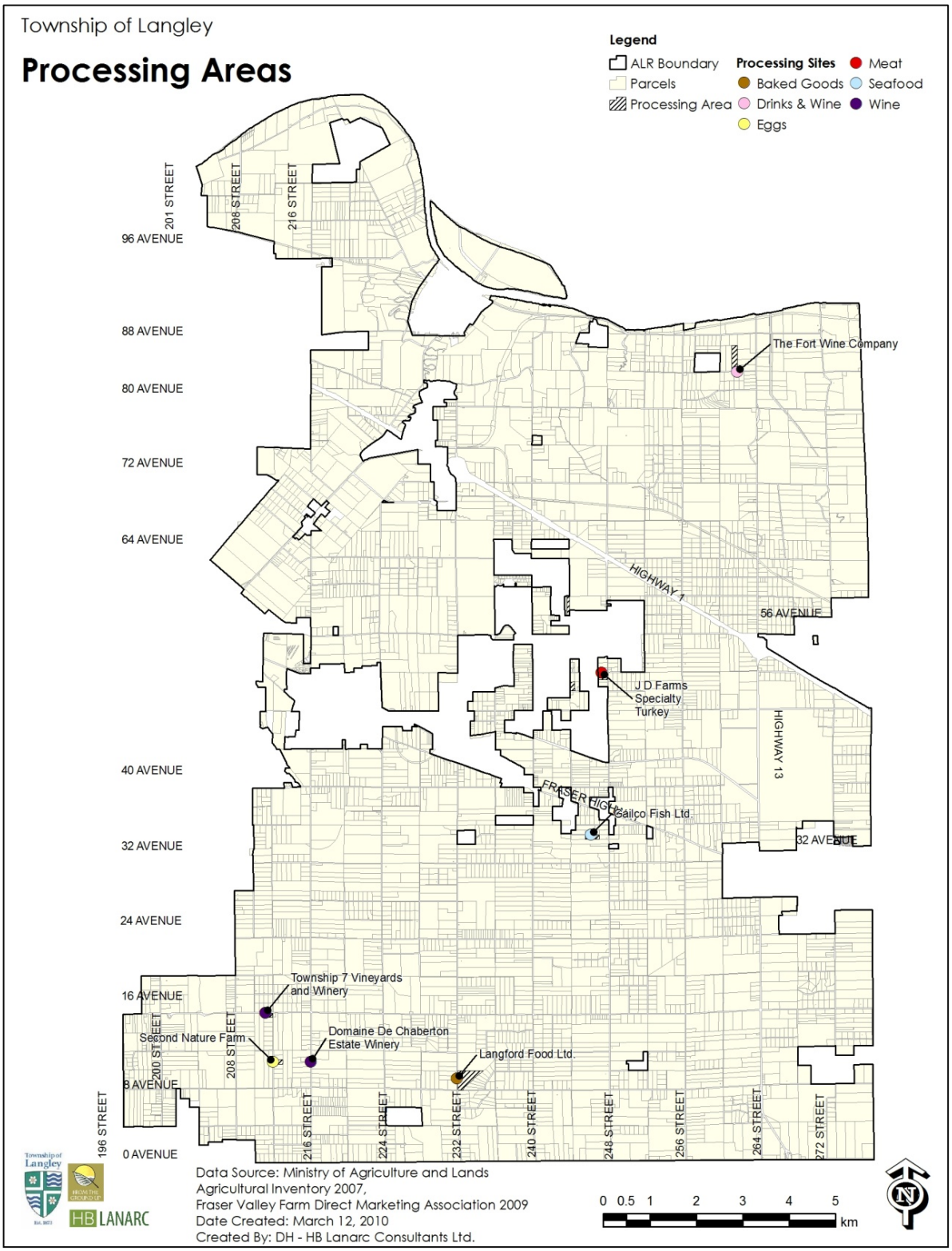


Figure 38. Processing Areas, 2009

9.4.4. Agri-Tourism Destinations

Figure 39 displays the location of popular agri-tourism destinations as defined by Circle Farm Tour (CFT).[2] CFT offers a self-guided road map that directs people to a variety of specialty farm-gate vendors, open air markets, eateries, heritage sites, fairs, and other special agricultural related events.

There are 15 agri-tourism destinations in the Township of Langley. The destinations appear well dispersed throughout the ALR area and demonstrate a diversity of activities including farm sites, dairy, winery, craft industry, and nursery.

9.4.5. Horse Farms and Residential Land Use Activity

Langley has dubbed itself the "Horse Capital of BC." There are clearly a large number of horse operations in the area.

Figure 40 shows parcels identified as horse farms or horse breeders and also illustrate the type of primary land use activity for these areas. A majority appear connected to residential land uses in the ALR, indicating that most are 'hobby farms.' A large amount of economic activity is generated from these operations in the form of feed and care, training, recreation, and equestrian markets. Hobby farmers also tend to maintain forage and fences and other improvements such as barns and outbuildings.

However, there are concerns about the intensity of grazing practices. Animals that are on pasture all winter can lead to overgrazing and severe trampling of paddocks. Manure handling is also a concern in many cases. This leads to threats of contamination of nutrients into groundwater. The identification and management of these farms will be a key issue for Langley's horse industry.

The Township of Langley recognizes the importance of the horse industry in Langley and that it should be enhanced through the creation of a Langley Horse Industry Strategy. Council adopted the Langley Horse Industry Strategy by resolution in May 1995, outlining the processes and steps to be taken to improve the economic viability of the horse industry in Langley.

[2] http://www.circlefarmtour.com/index.php

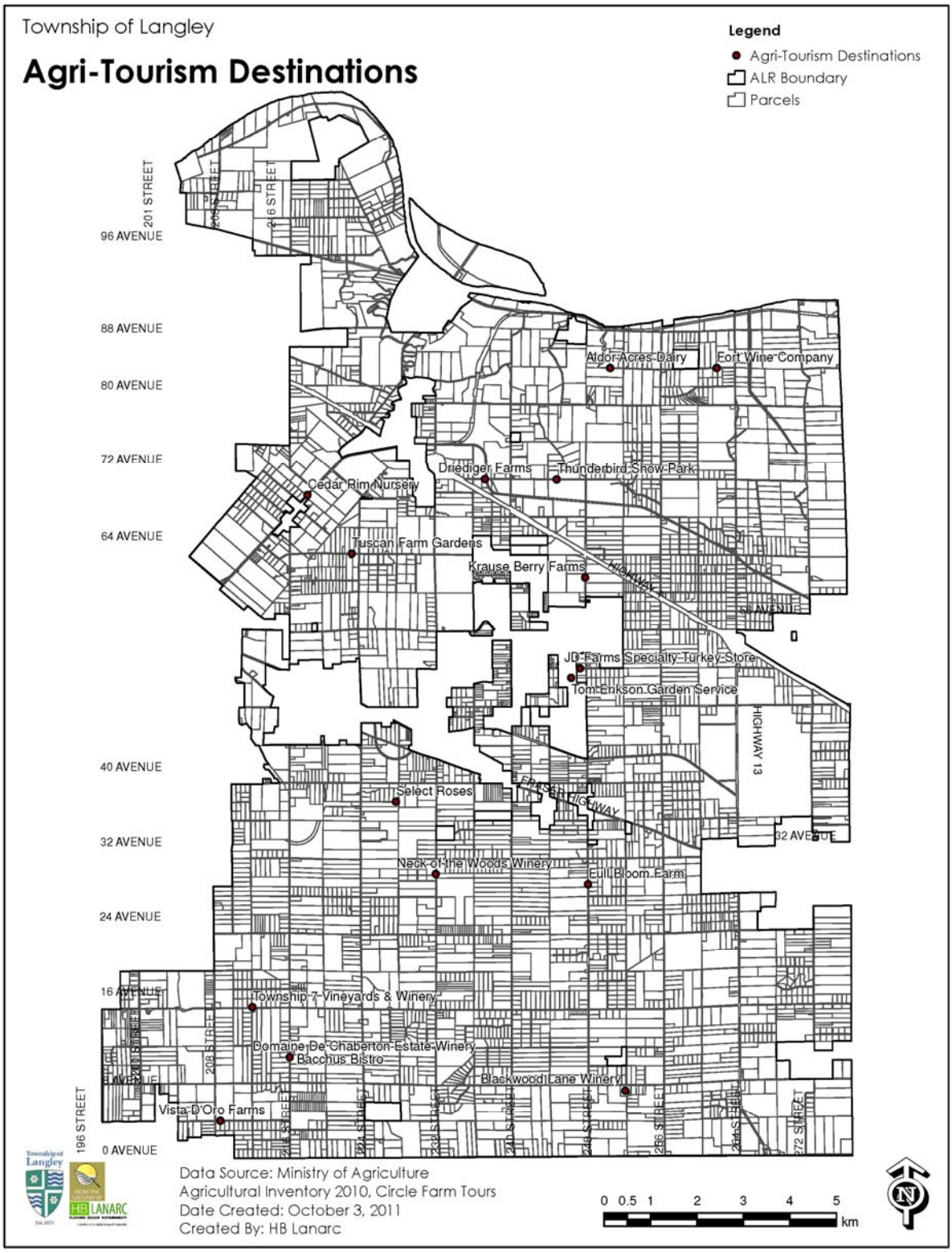


Figure 39. Agri-Tourism Destinations

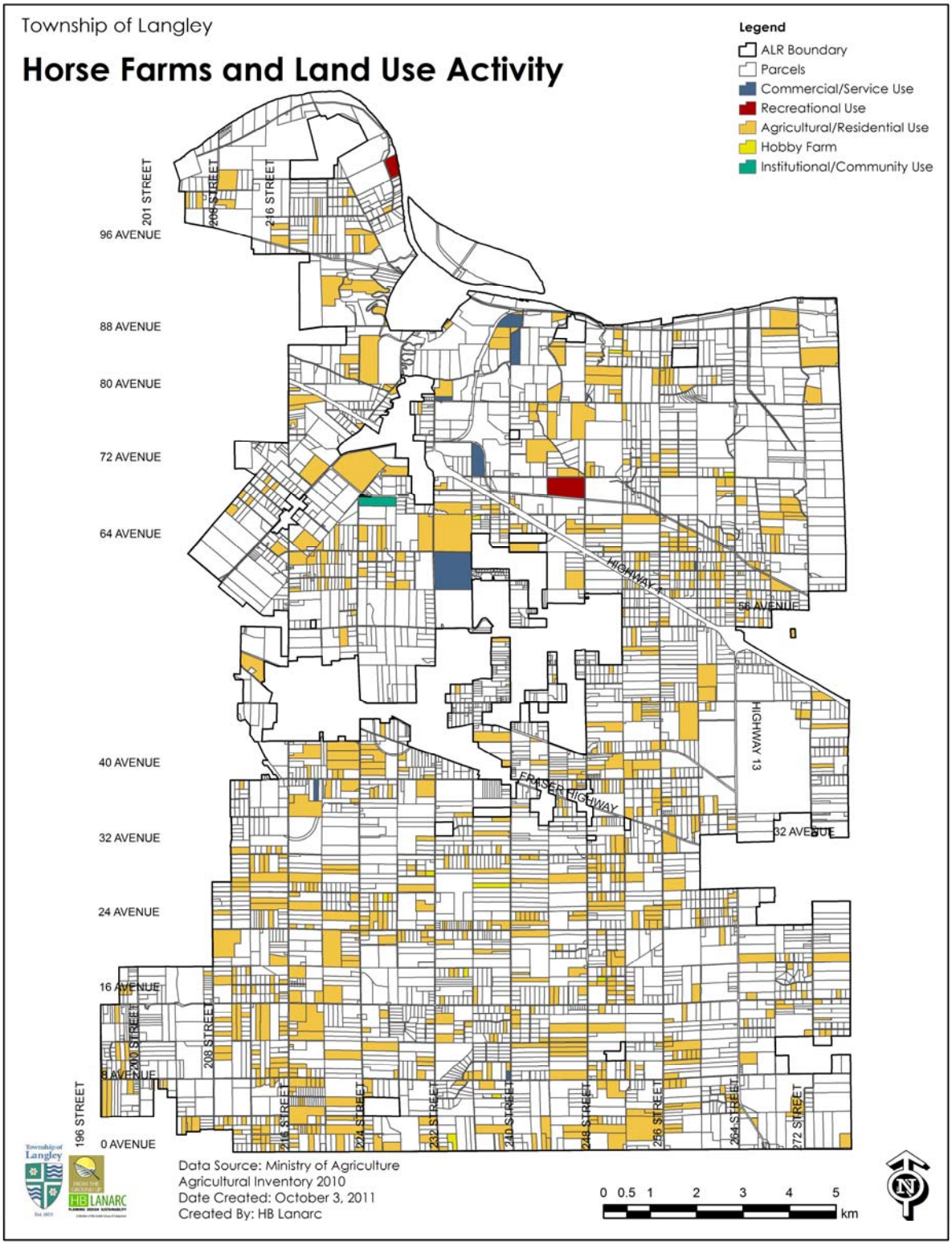


Figure 40. Horse Farms and Land Use Activity

9.5. Value-Added Agricultural Activities

Figure 41 classifies broader types of value-added agricultural activity and indicates parcels dedicated to identified agriculture related operations. This classification scheme groups operations that are focused on agricultural-related services or attraction that are related to community (e.g. children's centre), cultural (e.g. artist's studio), commercial, (e.g. pet grooming), farm operation (e.g. organic farm), food (e.g. herb farm), equestrian activities (e.g. training centre) as well as natural attractions (e.g. aquatic gardens).

Figure 42 demonstrates the share of each classified group to the total amount of identified value added agricultural activities.

The 2007 inventory indicates that most value-added activity comes from farm related products with 44 parcels found active in this type of operation, accounting for 40% of all value added activities. The berry industries are a large component of the Township of Langley's value added-industry. As of the 2006 Census on Agriculture, Langley was home to six wineries:

- Blackwood Lane Vineyards & Winery
- Domaine de Chaberton Estate Winery and Bacchus Bistro
- The Fort Wine Company
- Neck of the Woods Winery
- Township 7 Vineyard & Winery
- Vista D'oro Farms

Equestrian and Nursery activity is also significant, with 35 parcels found active in these type of operations, making up 31% of the total activities. The Township of Langley is home to a variety of commercial breeding and training facilities as well as recreational riding, both of which are supported by an extensive array of services including:

- feed and tack shops
- bedding suppliers
- boarding stables
- equine veterinarian practices
- BC's only neonatal horse hospital

Although it has been indicated that data for the 2007 inventory may be incomplete in terms of reported value-add activities, the trends seem to support current assumptions. Further study would provide more accurate counts and classifications of value-added activity and greater certainty to the current assumptions

See Appendix A for listing of operation name.

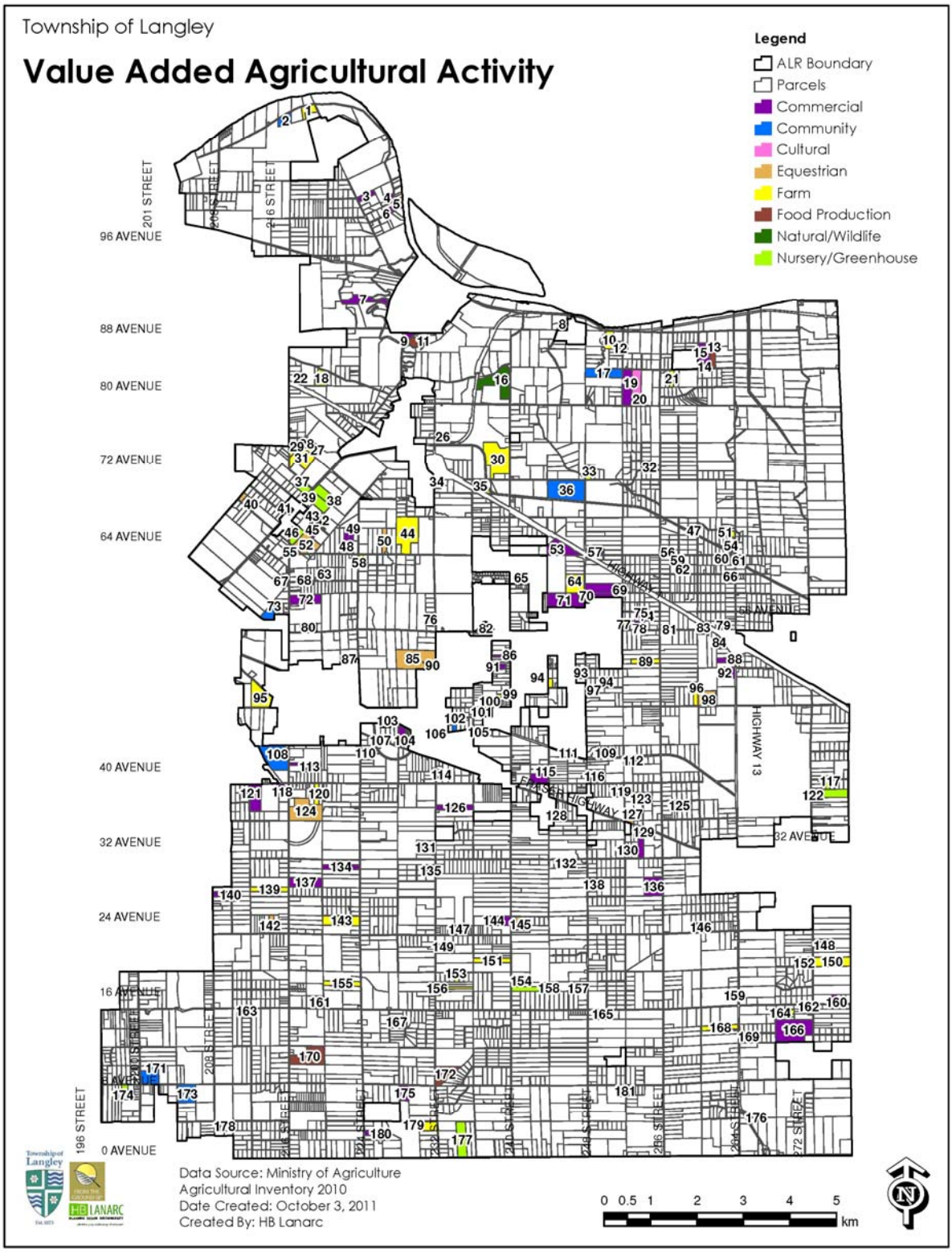


Figure 41. Value-Added Agricultural Activity

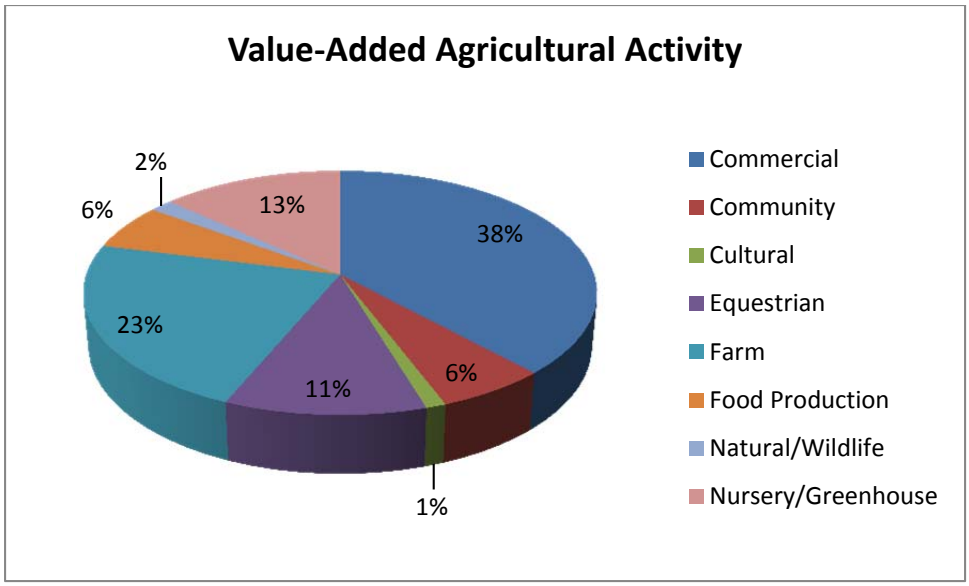


Figure 42. Value-Added Agricultural Activity

10. Commodity Profiles

10.1. Beef Farms

Beef is the second most common type of extensive livestock operation, with a total of 179 properties with beef cattle as a primary operation (Figure 43). 8% of the beef farms were medium size with 25-100 head of cattle, while 82% of the farms were small with 2-25 head of cattle (
Figure **44** and Figure 45). There were 67 new cattle operations by 2007 which increased the area by 450 hectares (1,111 acres). 1,662 hectares (4,106 acres) of beef farms remained from 2001. Two new cow/calf operations were added by 2007 with a total area of 26 hectares (64 acres). Changes in operations are shown in Figure 46. Due to methodological differences between the 2007 and 2010 inventories, notably the division between primary and ancillary operations, it is not possible to evaluate the changes in operations between these two inventory years. As such, Figure 46 should not be used to infer trends, and is solely presented for information only.

Beef cattle production in the Lower Mainland and on Vancouver Island is carried out almost exclusively on private land with most operations being relatively small in cow numbers and revenue. Of the 8.8 million hectares (21.7 million acres) of Crown range tenured by the Ministry of Forests, only 1% is from the Vancouver Forest Region[3]. The vast majority is in the interior of the province. The single most important factor that differentiates profit by region is land cost and feed availability.

Approximately 87% of BC produced cattle (beef and dairy culls) are finished and slaughtered outside of BC, in Alberta and the US. The final market for Canadian beef production is 60% exported, primarily to the US with the remainder going to South East Asia and Mexico[4].

There is potential for ranches to disturb fish habitat by watercourse riparian activity, and wildlife habitat, particularly predatory species through grazing competition. Grazing can modify and alter the composition of plant communities, though most effects are either considered of low to moderate severity, or able to be mitigated through sensitive and diligent range management.

[3] BC Ministry of Sustainable Resource Management, 2003
[4] *Ibid.*

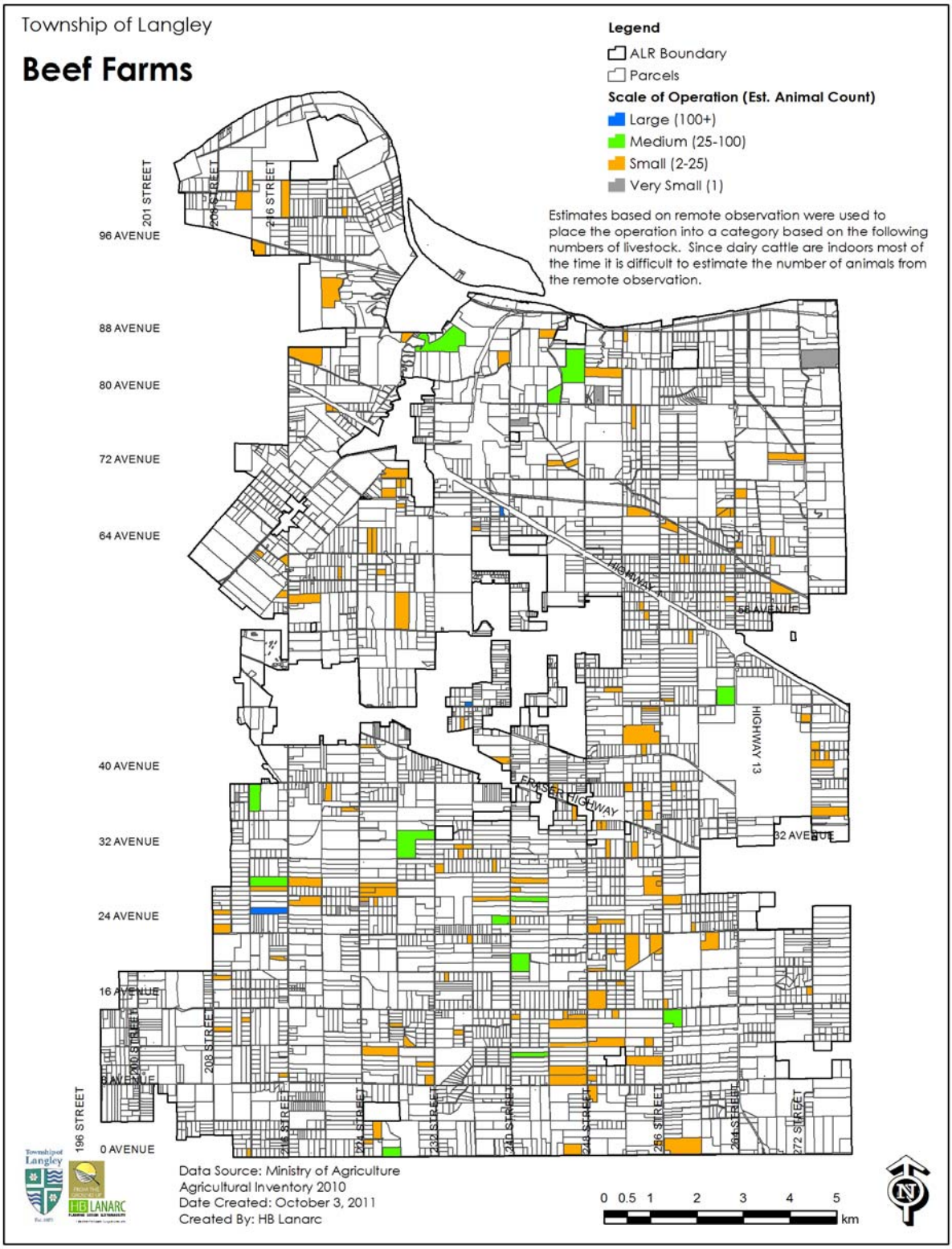


Figure 43. Beef Farms, 2010

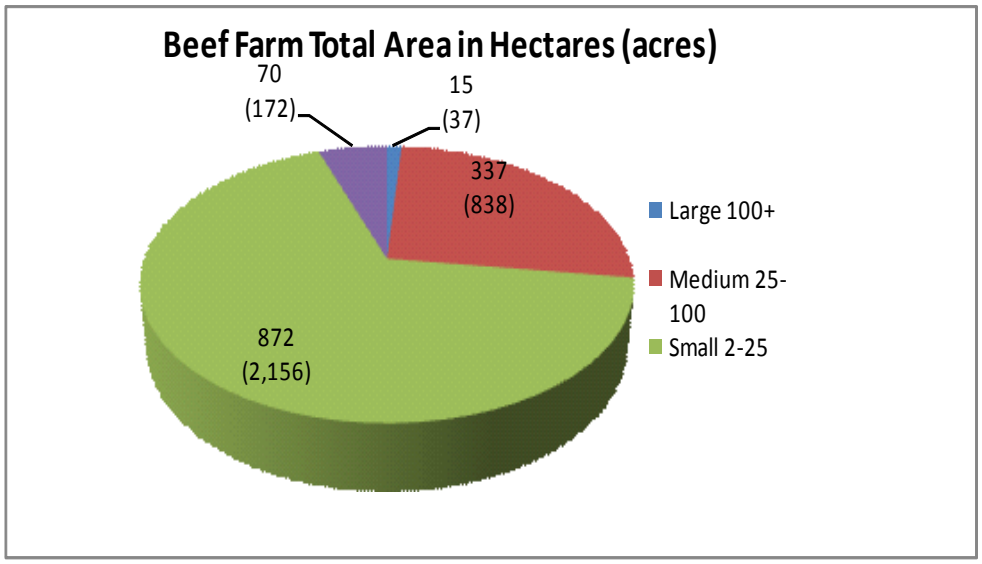


Figure 44. Breakdown of Beef Farms by Total Area

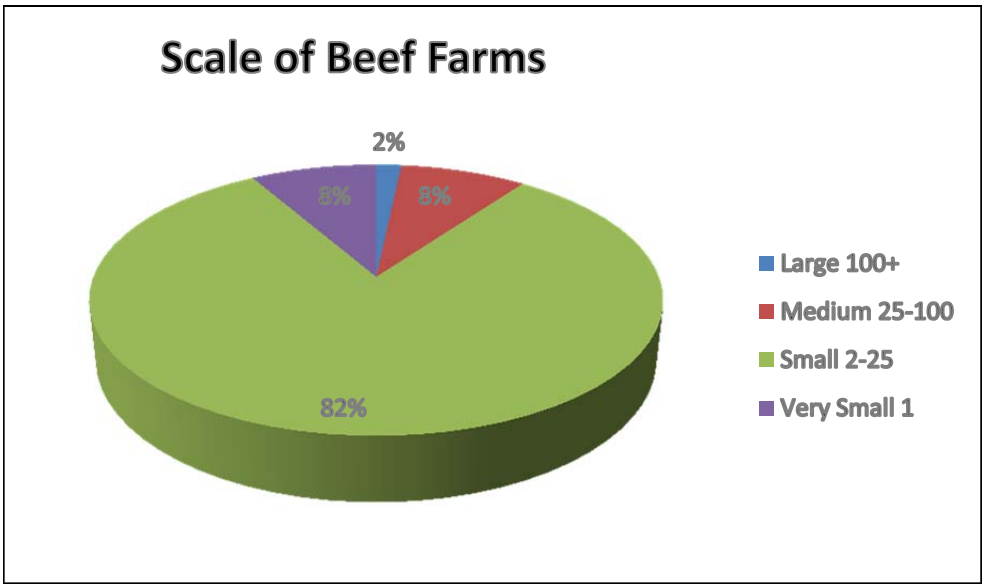


Figure 45. Breakdown of Percentage of Beef Farms by Scale

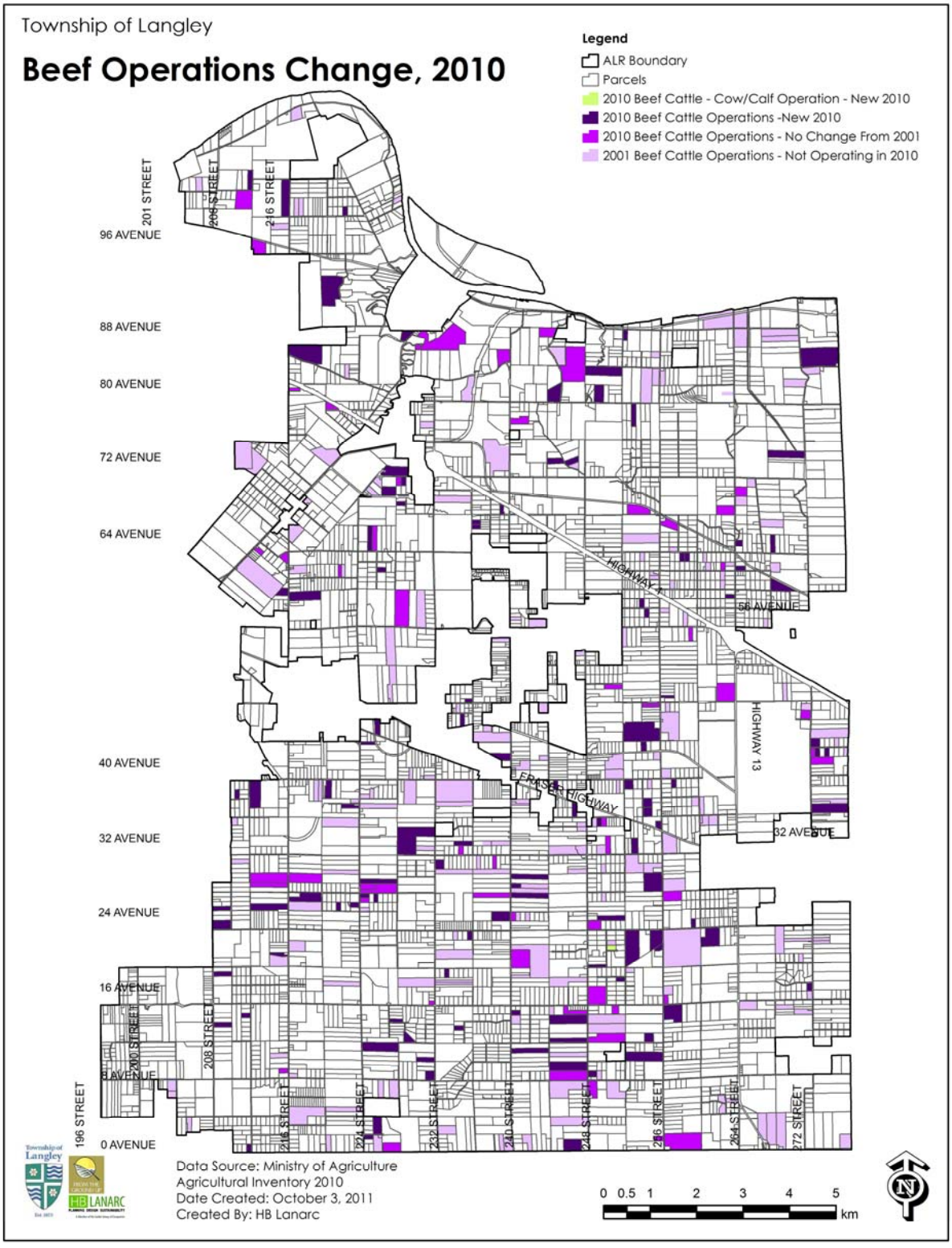


Figure 46. Beef Operations Change, 2010

10.2. Cranberry Farms

There were a total of 19 farms within the ALR in Langley whose main use was the production of cranberries, of which 13 farms remained the same from 2001. 62 hectares (149 acres) of new cranberries farms were introduced by 2010 (Figure 47). Their average parcel size of 15 hectares (37 acres) was relatively large compared to other agricultural uses.

The vast majority (about 95%) of cranberries grown in BC are marketed into the North American cranberry processing market, centered in the US. BC production accounts for about 12% of the North American crop, and is focused in the Fraser Valley. B.C.'s 2008 cranberry production was worth in excess of $56 million and represented 60 per cent of Canada's total cranberry exports[5]. An interest in cranberry related products is developing internationally and provides expanding markets for future exports such as Nutraceuticals (food based nutrition supplements).

Cranberry acres and yields have seen sustained growth over the last 50 years, but have also experienced severe price adjustments when over supply has occurred. Cranberry prices have dropped and inventories have risen in the 2008-2009 economic downturn[6].

10.3. Berries and Grapes Farms

There were a total of 173 farms within the ALR in Langley whose main use was the production of berries or vine crops. The most common types of berry were cranberry, raspberry, and blueberry. These were generally large parcels, with an average size of 10 hectares (25 acres). Figure 48 shows the change in berry and grape farming. 809 hectares (1,998 acres) of new berry farms were added by 2010. 819 hectares (2,022 acres) of berry farms remained from 2001 while 116 hectares (286 acres) of berry farms were lost from 2001. 18 hectares (44 acres) of new vineyards were introduced by 2010 while 34 hectares (84 acres) of vineyards remained from 2001.

Due in large part to the successful marketing of blueberries for their health and nutraceutical properties, significant raspberry area have been converted to blueberry production in the Fraser Valley since 2006. However, in the last two years supply has substantially outpaced demand with a significant drop in farmgate prices[7].

All outdoor berry crops are subject to fluctuations in weather, and undergo yield volatility from year to year. In addition, because of the relatively short harvest windows, the bulk of the harvest exceeds local fresh market demand. As such, the largest portion of all berry crops is bulk frozen for processing.

Berry production relies on pollination by bees to enable fruiting. The need for, and presence of, apiary activity in the Fraser Valley has increased significantly with the increase in berry area.

[5] Agriculture and Agri-Food Canada, 2010

[6] Cranberry Marketing Committee, 2009

[7] Zbeetnoff Agro-Environmental Consulting, 2009

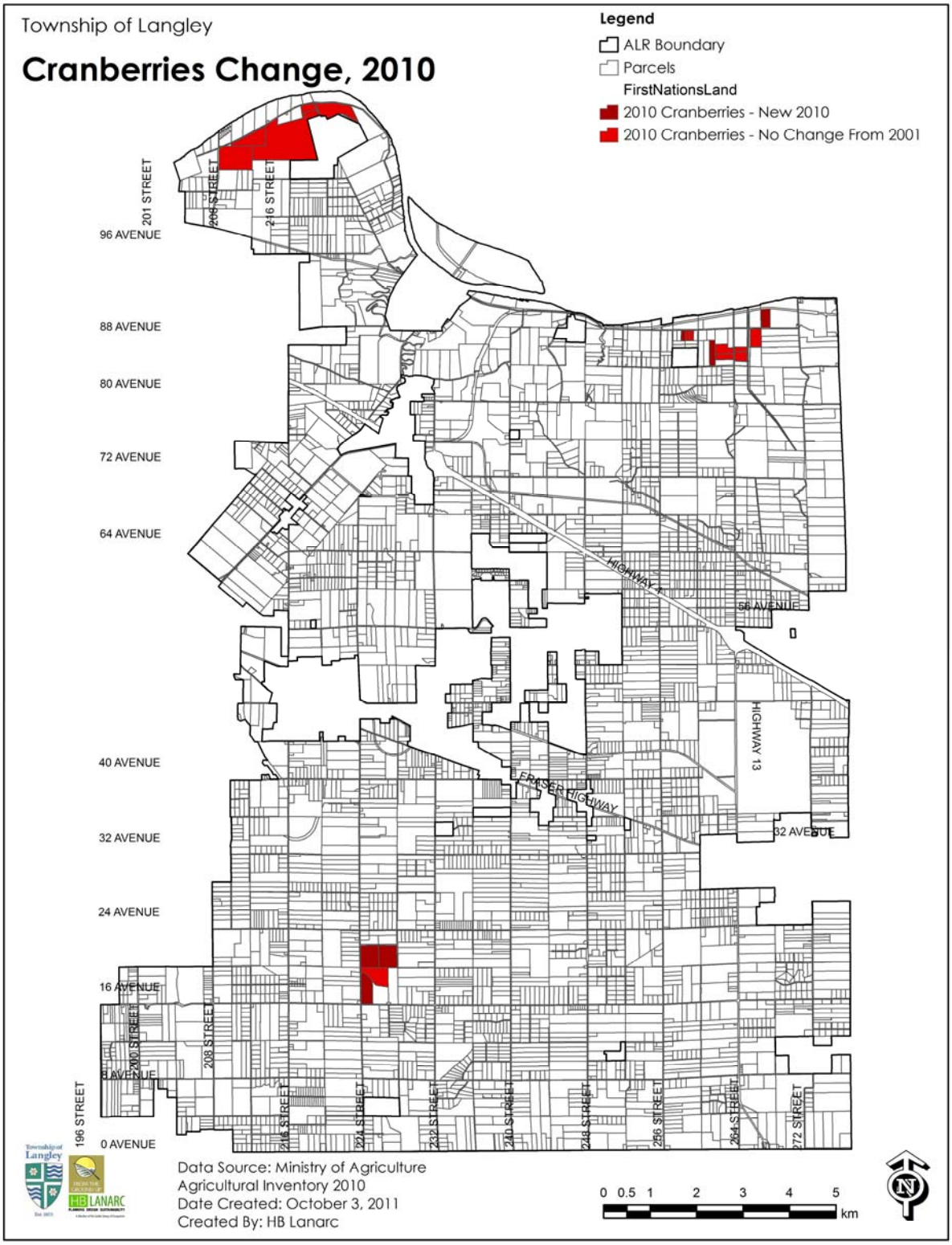


Figure 47. Cranberries Change, 2010

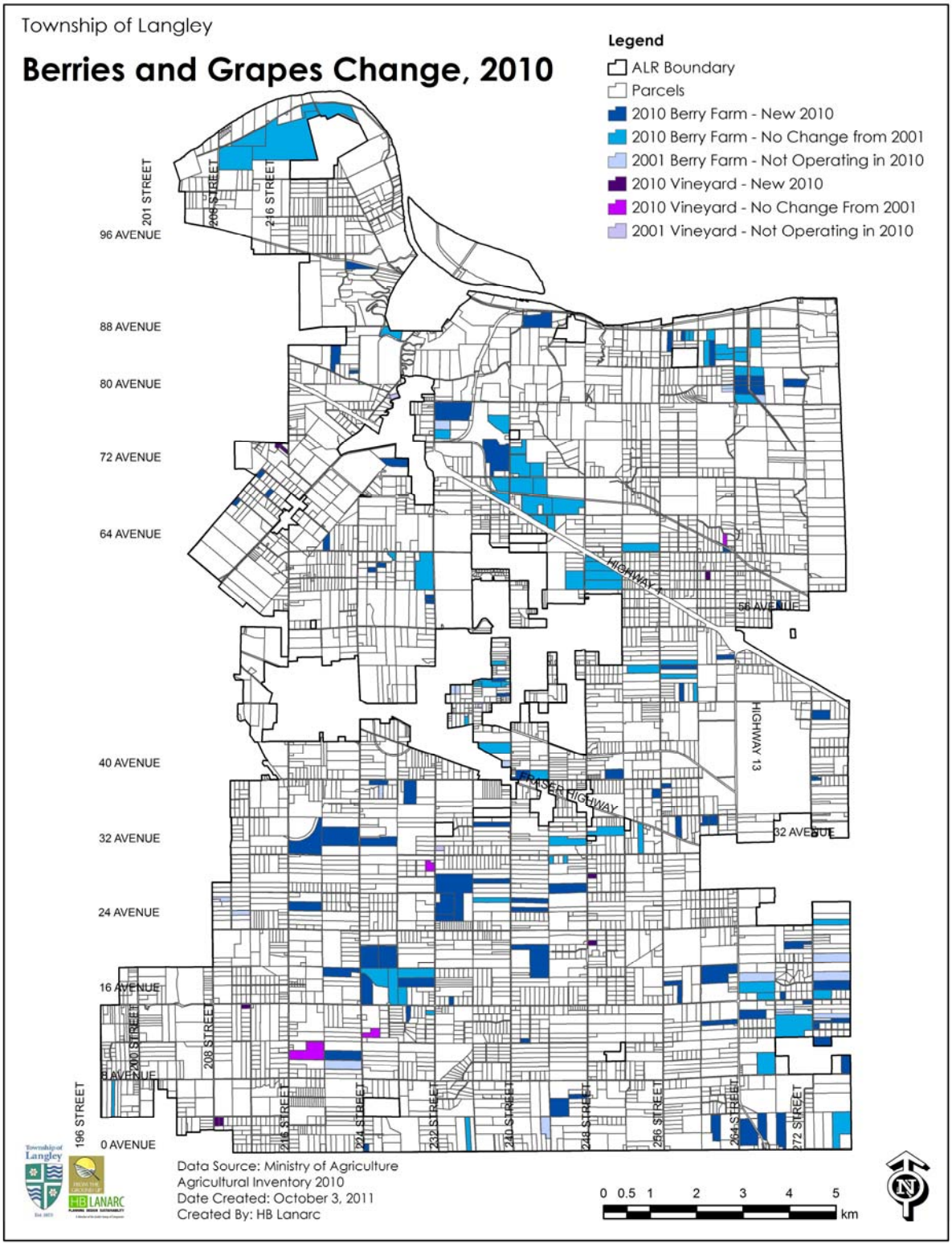


Figure 48. Berries and Grapes Change, 2010

10.4. Dairy Farms

The third most common type of extensive livestock is dairy farming, with a total of 20 properties where the primary use was dairy operations, as shown in Figure 49. Since dairy cattle are indoors most of the time it is difficult to estimate the number of animals remotely. Due to methodological differences between the 2007 and 2010 inventories, notably the division between primary and ancillary operations, it is not possible to completely evaluate the changes in operations between these two inventory years. As such, Figure 49 should not be used to infer trends, and is solely presented for information only.

According to the census, the number of dairy cattle in the Township of Langley has increased from 2,446 cows in 1991 to 2,986 cows in 2006 (an increase of 22%), as shown partly in Figure 50. However, during that same period, the number of farms reporting has dropped from 101 to 41 (a decline of almost 60%). Dairy farms have grown in size, in general, and have migrated away from Vancouver towards areas with lower cost lands.

Figure 51 shows the breakdown of total area for dairy farms; medium-sized farms (25-100 head per operation) make up 73% of the total dairy farm area.

Figure 52 shows the breakdown of sizes for dairy farms. Approximately 62% of all dairy farms in the Township are medium-sized with 2 to 25 animals. Table 14 show comparisons of dairy farms by industry scale from the regional to national level.

In 2007, there were a total of 46 farms within the ALR whose main use was dairy production. 41 farms remained the same from 2001. 87 hectares (214 acres) of new dairy farms were introduced by 2007 – an increase of 11%. However 921 hectares (2,275 acres) of dairy farms were lost to other activities. At 19 hectares (47 acres), their average parcel size was relatively large compared to other agricultural uses.

Trends in the Canadian market are towards lower per capita consumption of fluid milk, and higher consumption of other dairy products, such as yogurt, cheese and cream. About 59% of BC milk goes to the fluid market, with the remaining 41% to the industrial market[8]. More milk is being produced by fewer cows as improved animal nutrition, genetics, and herd management are generating increased productivity per cow. Despite an increase in organic producers, the provincial organic fluid milk and organic dairy product markets are still significantly undersupplied.

With a trend towards the consolidation of dairy operations into larger operations, manure management is an ongoing challenge. Although dairy producers tend to have arable land available to apply manure beneficially, in order to avoid the risk of environmental contamination the manure must be applied only during restricted windows. As a result, all intensive dairy operations must have the manure storage capacity to carry manure over the rainy months. One option generating a growing interest is the use of on-farm anaerobic digesters to convert dairy manure to biogas energy that can then be used to generate electricity, heat, and/or natural gas. These systems have the potential to reduce greenhouse gas emissions, odour, and nutrient runoff[9].

[8] PriceWaterhouseCoopers, 2009

[9] Anaerobic Digestion Initiative Advisory Committee of BC, 2009

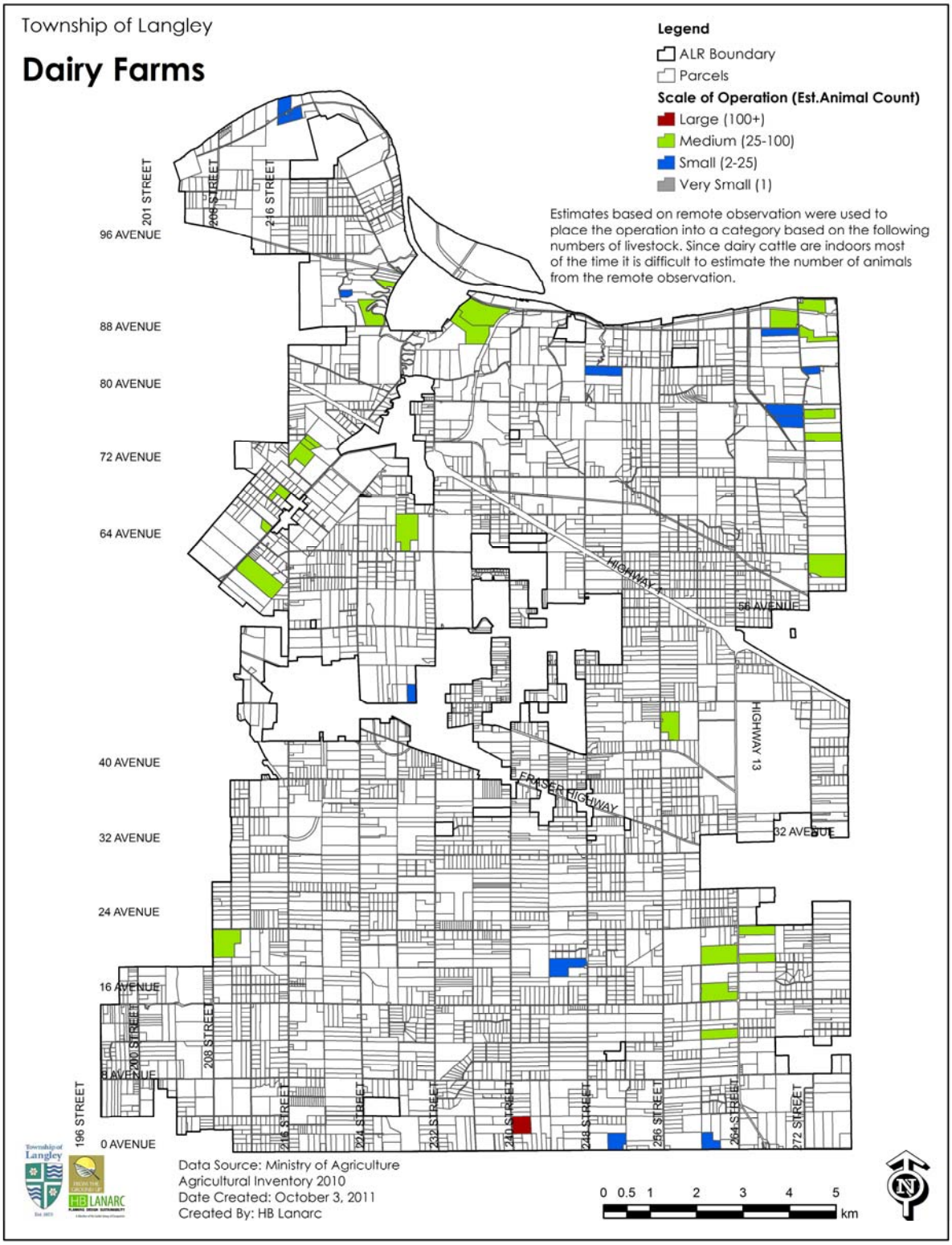


Figure 49. Dairy Farms, 2010

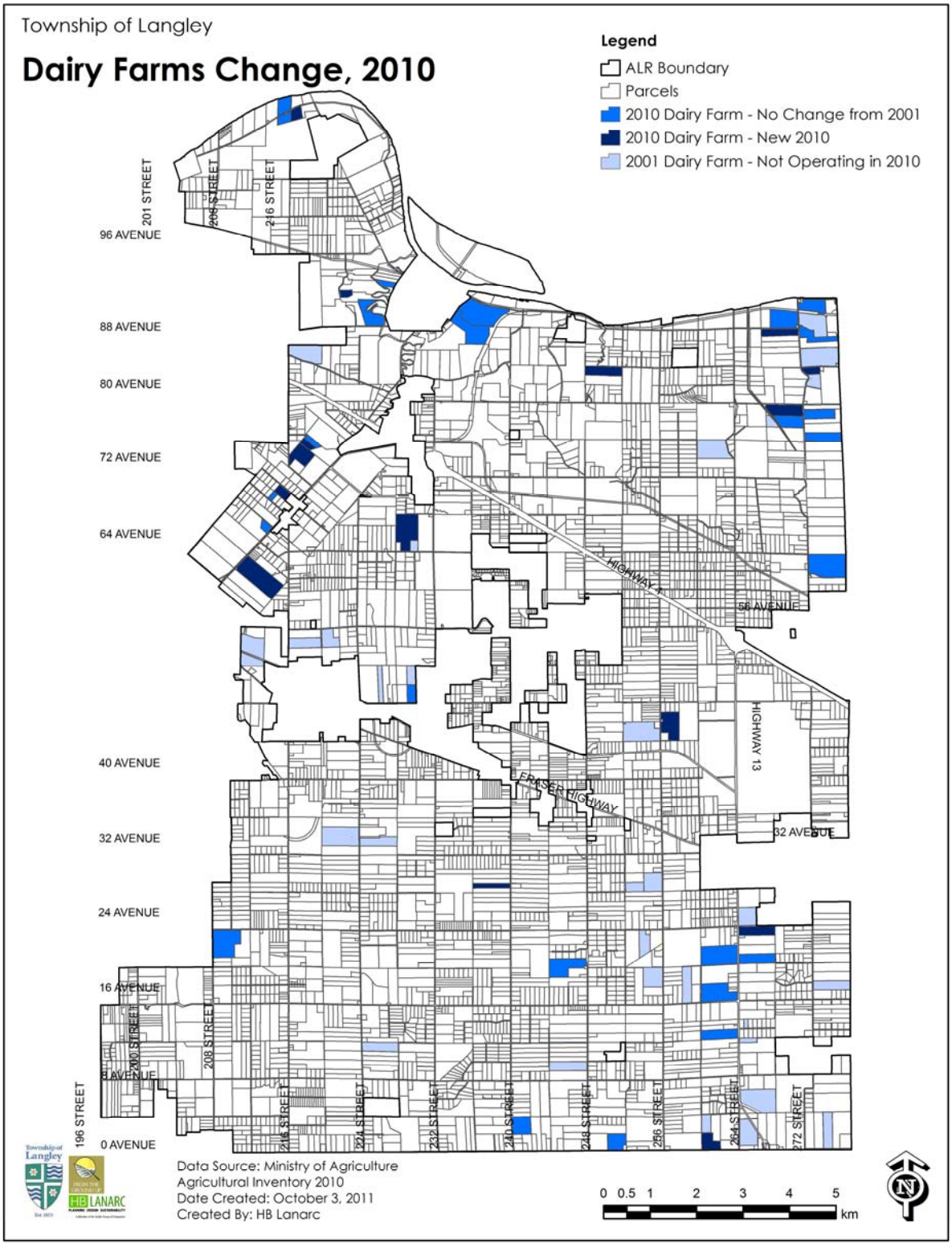


Figure 50. Dairy Farms Change, 2010

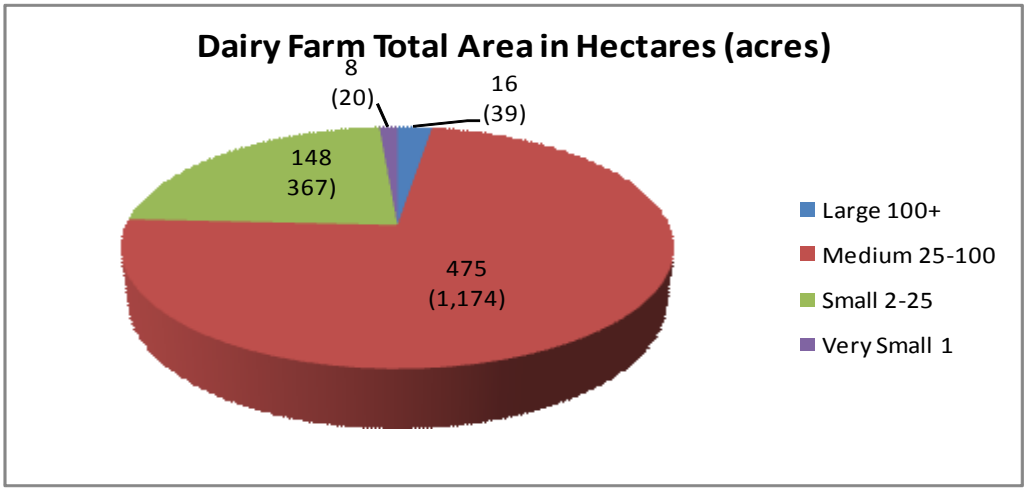


Figure 51. Breakdown of Dairy Farms by Total Area

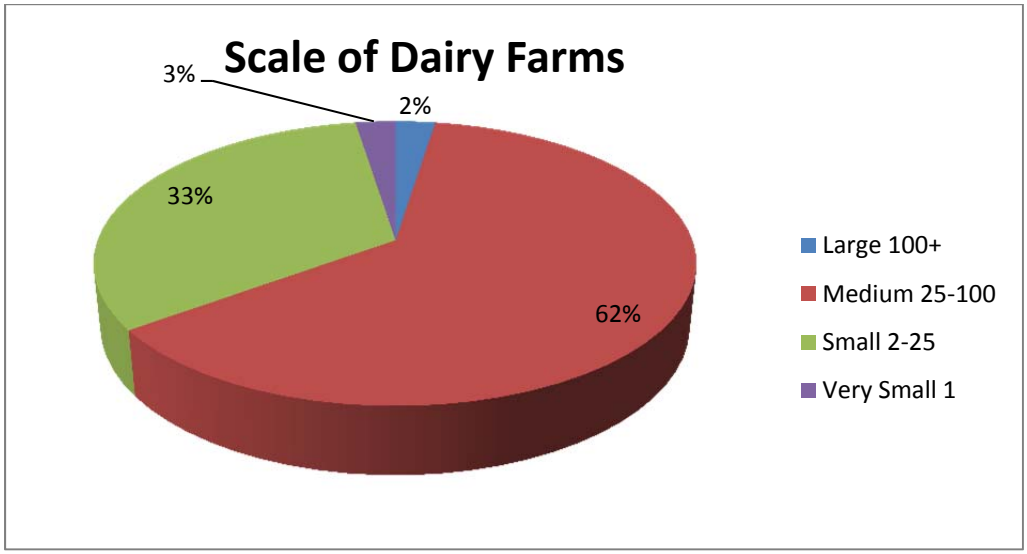


Figure 52. Breakdown of Dairy Farms by Scale of Operation

Table 14. Dairy Farms by Industry Scale

Percent of Total Farms	Langley	Greater Vancouver	Lower Mainland-Southwest	British Columbia	Canada
Dairy cattle and milk production farms	3%	3%	8%	3%	6%

(Source: Statistics Canada, 2006)

Note: The farm type is based on the North American Industry Classification System (NAICS) farm-typing categories.

10.5. Greenhouses

In 2010, there were a total of 71 farms within the ALR whose main use was greenhouse operations or nurseries including greenhouses (Figure 53). Of those farms, 45 had greenhouse operations as their primary agricultural use and 26 reported greenhouses as part of their nursery operations. Due to methodological differences between the 2007 and 2010 inventories, notably the division between primary and ancillary operations, it is not possible to completely evaluate the changes in operations between these two inventory years. As such, evaluation of change in the greenhouse sector will be limited to the 2001-2007 interval only. Accordingly, 48 hectares (119 acres) of new nurseries including greenhouses were introduced between 2001 and 2007 – an increase of 19.8%. At 9 hectares (22 acres), their average parcel size was relatively large compared to other agricultural uses. 90% of greenhouse operations indicated residential as an ancillary use.

In 2006, the Township of Langley had the second largest area in greenhouse production in BC. According to the Census, total greenhouse production area increased from 31 hectares (77 acres) in 1991 (78 farms) to 77 hectares (190 acres) in 2006 (106 farms), an increase of 244%.

Roughly 80% of the volume generated in commercial greenhouse vegetable production in the Lower Mainland is marketed in the US. BC growers of greenhouse vegetables face high competition from Mexico, largely resulting from relatively higher labour and cold-climate energy costs in BC, and the rapidly increasing growth of greenhouses in Mexico that often oversupply the market. Competition with Mexico has now grown from the US market into the domestic market.

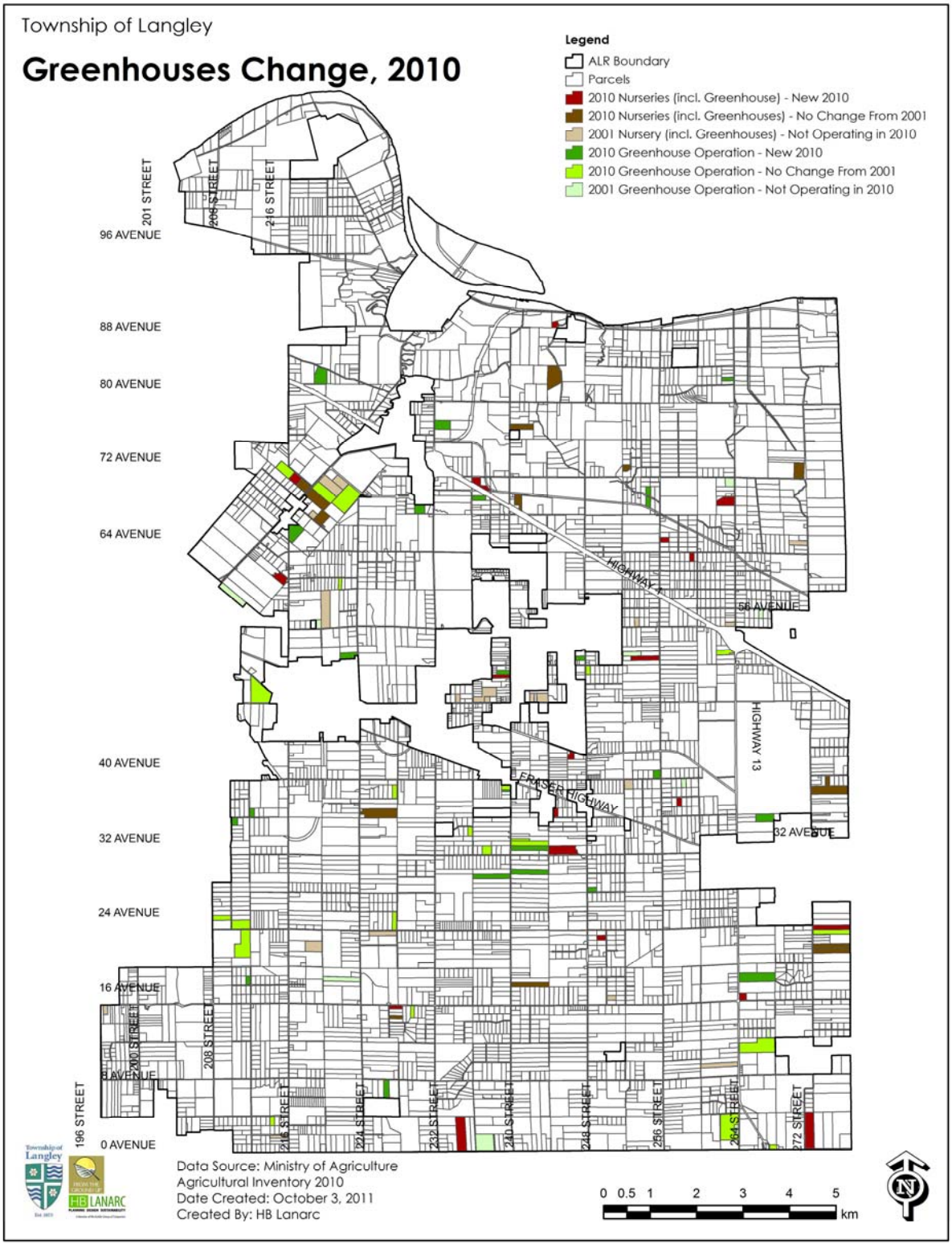


Figure 53. Greenhouses Change, 2010

10.6. Horse Farms

The most common type of extensive livestock in the Township of Langley's ALR is horses, with 471 farms in 2010 reporting horse operations as their primary agricultural use, shown in Figure 54. The great majority (74%) of these horse operations were categorized as small.

The Township of Langley's local equine industry, valued at over $50 million annually, produces horses that perform at world-class levels. Equestrian stables within the Township of Langley supplied two equestrians and two grooms to the 2004 Canadian Summer Olympic Games Team, as well as an equestrian, a groom and a Chief Classifier to the 2004 Canadian Paralympics Games Team. This thriving horse industry can be considered one of the municipality's largest agricultural activities, although it is not generally seen as part of mainstream agriculture. In fact, the municipality's horse industry not only has a significant role in the Township of Langley's agricultural sector, but it also is an important source of sports and recreation.

Having more horses than anywhere else in the province, the Township of Langley is referred to as the Horse Capital of British Columbia. The proximity of breeding and training centres to local racing tracks, and an urban population, provides a good market base for the Township of Langley's equine economy. Figure 54 and Figure 55 show only the larger components of the Township's horse industry, which is made up of many complex subcomponents. According to the 2001 Census of Agriculture, approximately 506 farms in the municipality contain a total of 4,724 horses and ponies, representing over 8.8% of the provincial total. Commercial breeding and training facilities, as well as recreational riding establishments, require an extensive array of equine suppliers and services. These include feed and tack shops, bedding suppliers, boarding stables, farriers, equine veterinarian practices, and British Columbia's only neonatal horse hospital.

Thunderbird Show Park holds five major hunter and jumper tournaments a year and hosts a variety of different equestrian events and shows. Located near Fort Langley, the equestrian centre is approximately 34 hectares (85 acres) in size. Considering the horse industry is expected to grow and remain a generator of jobs and services to the Township of Langley's economy, the Langley Economic Development Commission prepared a *Horse Industry Strategy*. This strategy addresses marketing for the horse industry, developing facilities and providing equine educational programs.

The Lower Mainland is responsible for approximately 1/5 of the province's horse industry. Horse production units typically support 7 mares, using a medium size property of 10 - 70 acres[10]. Horse farm operations in Langley are shown in Figure 56 and Figure 57.

Horses may be reared on breeding farms, attend training farms, and be housed in facilities that vary from large equestrian facilities to backyard shelters. Due to population growth and the high cost of land, it is increasingly rare for horses to pasture free on large pastures. Some are located on very small parcels of land or are boarded along with others in large facilities. These situations, if not properly maintained, can lead to conflict, generating a variety of complaints such as noise and odour.

[10] Ministry of Agriculture, Food and Fisheries, 2004

One of the largest issues relating to the industry is the storage of manure. Excess water in the form of roof water or uphill runoff can mix with manure in the horse confinement areas, and trickle through to become wastewater. When this wastewater enters a ditch or stream it creates a water quality problem for those living downstream, as well as for fish and wildlife.

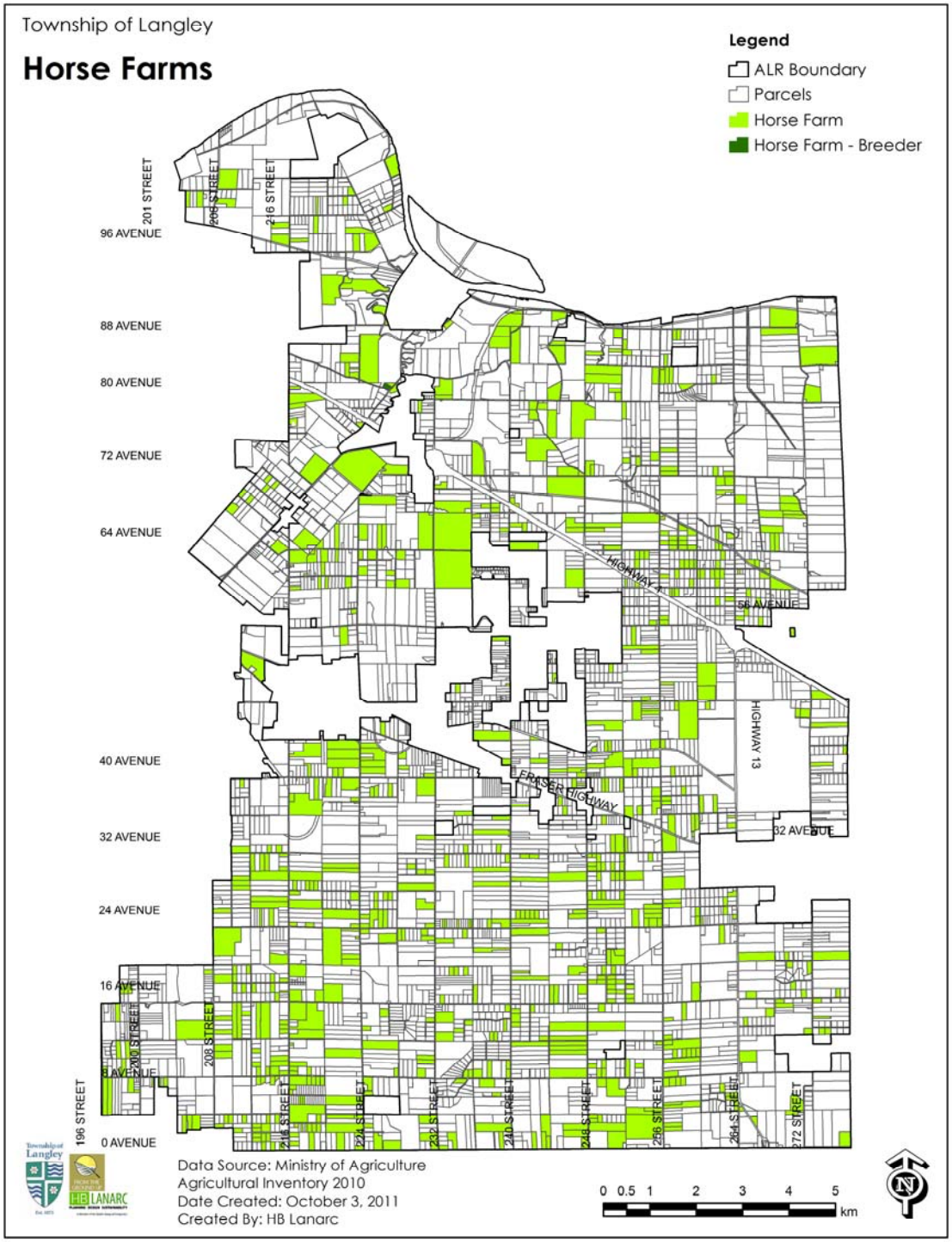


Figure 54. Horse Farms, 2010

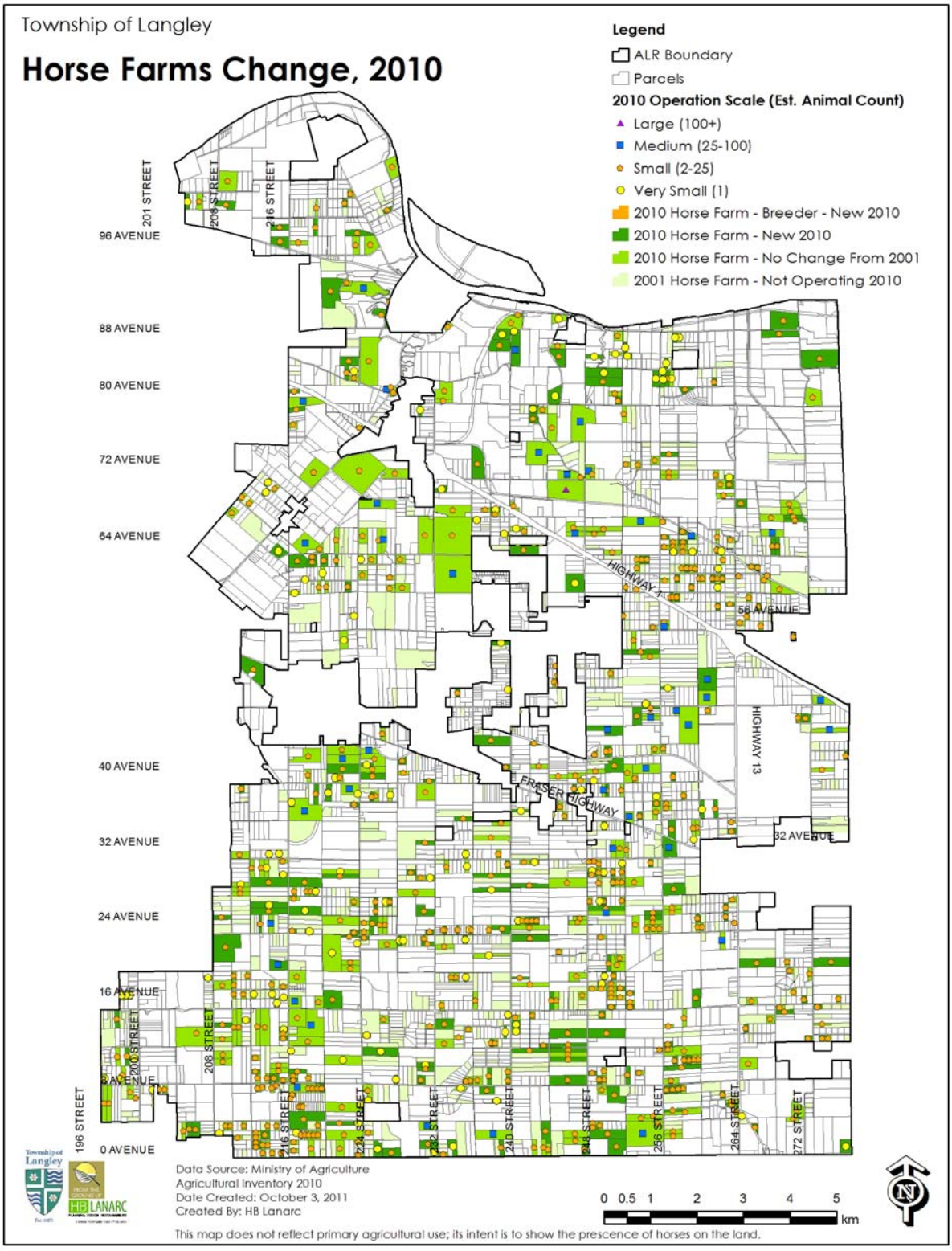


Figure 55. Horse Farms Change, 2010

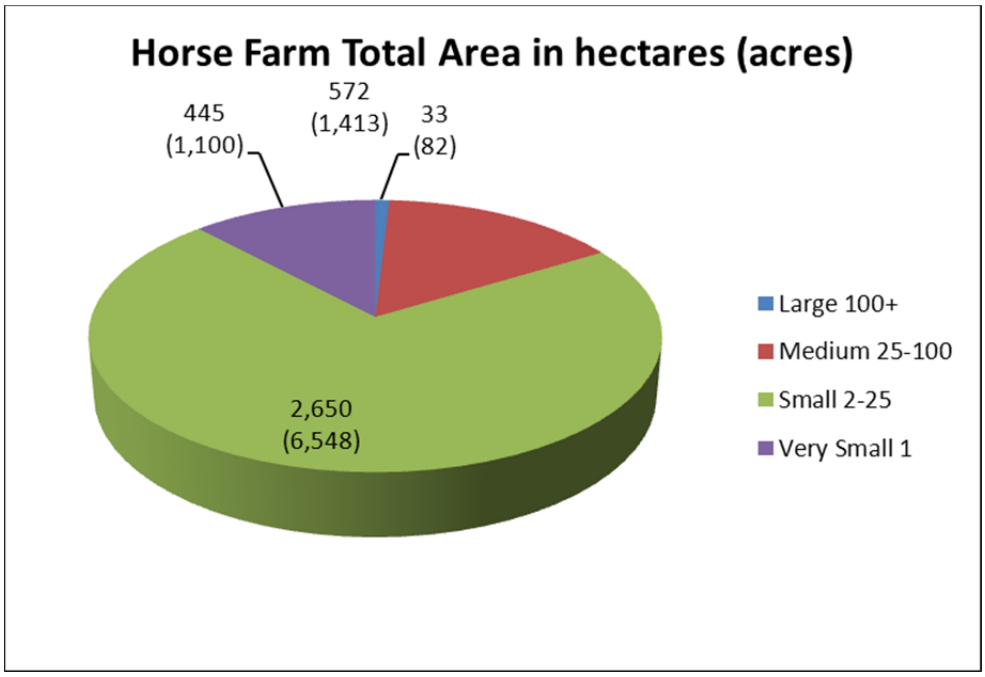


Figure 56. Breakdown of Horse Farms by Total Area

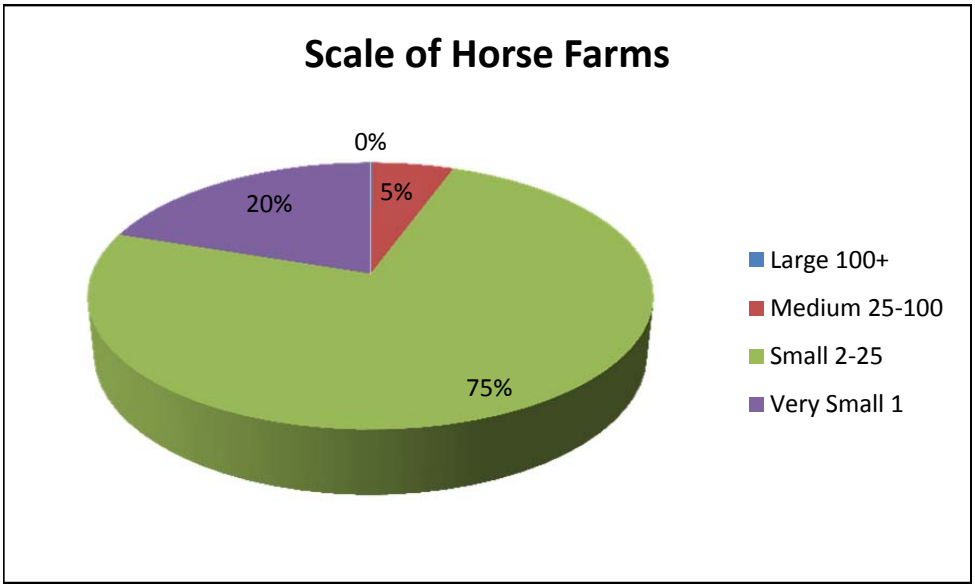


Figure 57. Breakdown of Horse Farms by Scale of Operation

10.7. Mushroom Farms

Figure 58 shows there are 15 mushrooms farms within the ALR. At 9 hectares (22 acres), their average parcel size was relatively similar compared to other agricultural uses. All 15 operations reported mushroom farming as their main use.

Mushroom production has declined significantly in the Township of Langley. In 1991, there were 36 farms with 100 hectares (250 acres) m^2 of production area. By 2006, this had dropped to 17 farms with 77 hectares (190 acres) in production – a decrease of 25%.

The Canadian cultivated mushroom sector is export oriented; BC exports about 65% of its fresh market mushroom production[11]. Opportunities exist in the specialty mushroom market (such as oyster and shitake) for diversification not only into different product types but also markets, since there is the prospect of replacing imported fresh and dried specialty mushrooms in the local market through smaller scale production. Better management practices and adoption of new production techniques could also provide opportunities for improvement in the mushroom sector.

10.8. Nurseries

The "nursery" category was assigned to parcels growing ornamentals and shrubs, either in the ground or in containers. Many of the "nursery" operations had some Christmas tree components as well.

In 2010, there were a total of 152 farms within the ALR whose primary use was nurseries. At 5.2 hectares, their average parcel size was relatively small compared to other agricultural uses. 90% of farms reporting nurseries also indicated residential as an ancillary use.

Nursery production is increasing in the area (Figure 59). In 1991, there were 155 farms reporting 260 (964 acres) hectares of production. According to 2006 census figures, this had increased to 187 farms with 410 hectares (1013 acres) of production in 2006 – an increase of 21% in farms. Even though the average parcel size is relatively small, nursery operations tend to generate high levels of revenue per hectare compared to other crops.

Much of the demand for the ornamental nursery sector has arisen from growth in the construction industry and the renewed interest of the public in gardening and landscaping. Nurseries commonly use a combination of field, container, and greenhouse growing and propagation production methods. The sector is subject to weather related losses from year to year, including wet weather, unseasonable thaws, heavy snow events, and frost periods.

In the last decade, significant changes to management have been enforced in the nursery industry in response to pesticide use, alien species, and disease outbreaks. Since 2003, the sector adopted mandatory regulatory controls to prevent the establishment of disease, limit economic losses, retain US export markets, and protect native BC plants. The annual nursery sampling, testing, and audit procedures now in place have added costs to production while providing certification of disease status.

[11] BC Cultivated Mushroom Industry, 2006

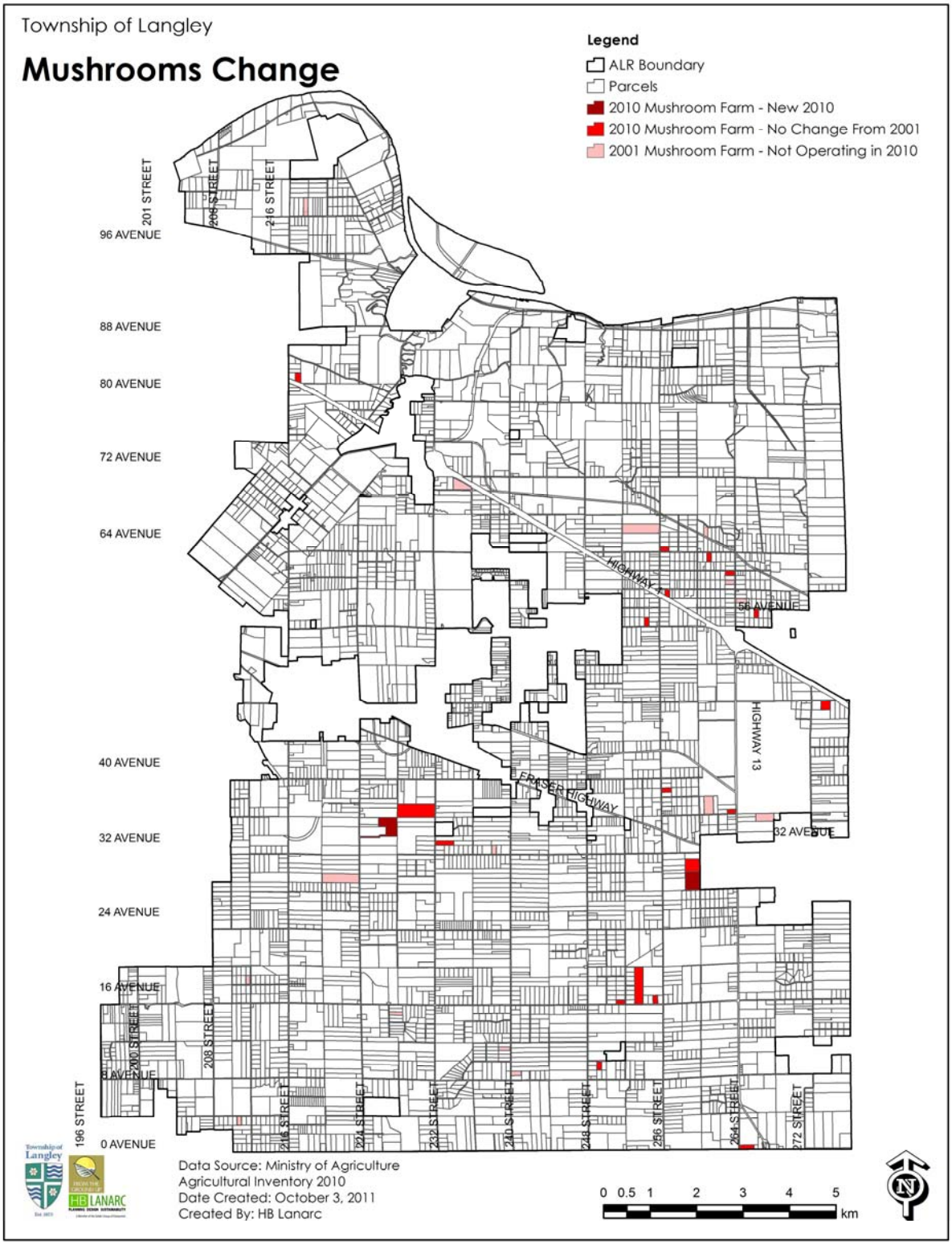


Figure 58. Mushroom Farms Change, 2010

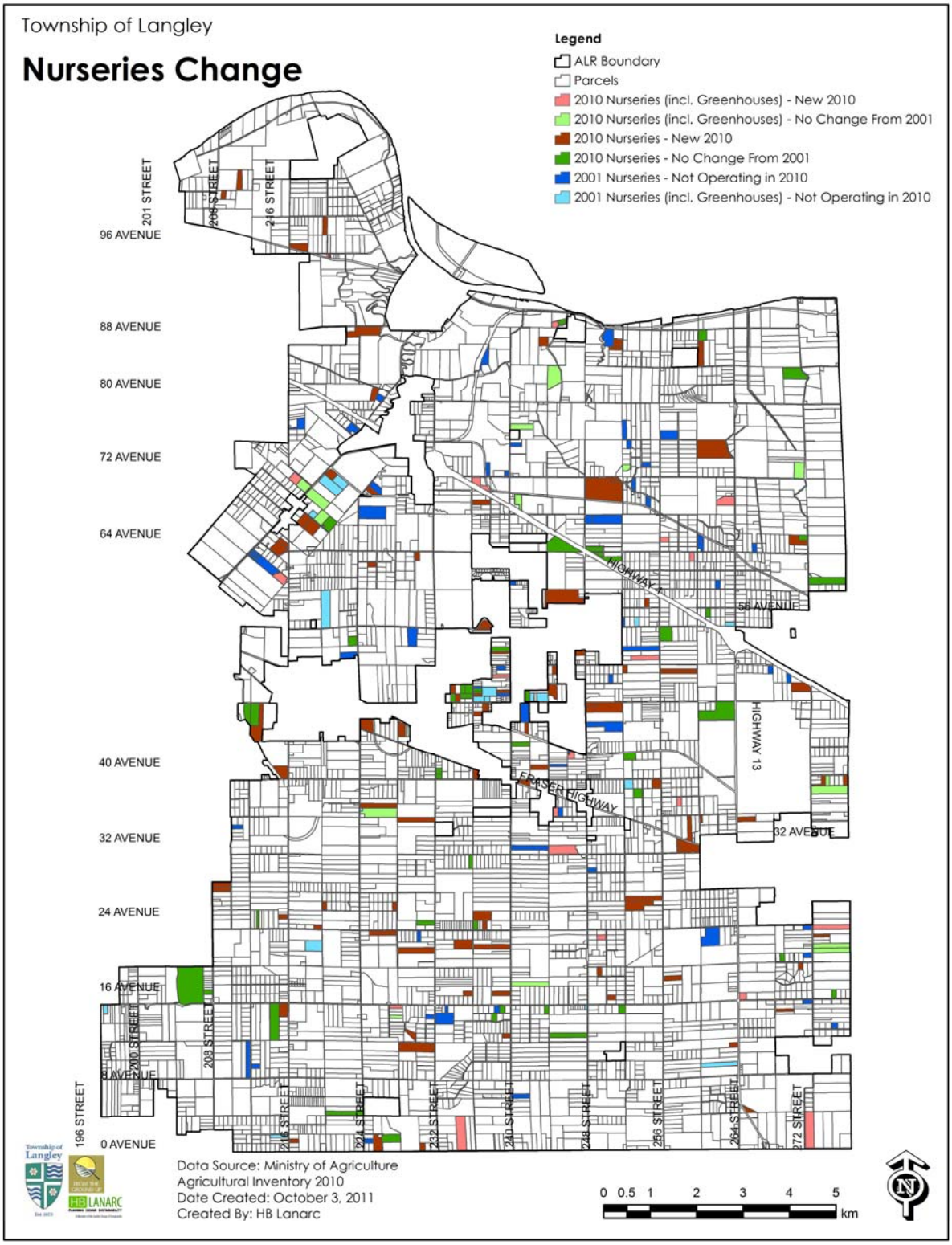


Figure 59. Nurseries Change, 2010

10.9. Poultry and Egg Farms

Intensive, or housed, livestock operations refer to livestock that are raised exclusively inside a building. The most common type of intensive livestock in the Township of Langley ALR is poultry, shown in Figure 60. There were a total of 99 farms within the ALR whose main use was poultry; of those 85% are intensive operations. The remaining 15% are backyard operations.

The number of intensive poultry operations increased between 2001 and 2010 and production per farm increased as well. There were 25 new poultry farms, an increase of 35% compared to 2001. Poultry production can, and often does, occur on smaller parcels. However, as parcel size decreases and intensity increases, there can be concerns with noise, odour, and manure management. The established, long-term poultry producers have generally made improvements to their operations to deal with these concerns. Figure 61 shows the breakdown of percentage of poultry farm mix.
Figure 62 shows the breakdown of poultry farm total area.

The Avian Influenza (AI) outbreaks in the Fraser Valley in 2004 and 2005 caused a significant decrease in output in all poultry sectors, but it does not seem to have had a lasting impact on the per capita demand for poultry meat (Figure 63). The AI outbreak had a larger impact on egg production, in particular with the broiler hatching egg sector. This sector is an input supplier of 80% of the demand from the BC chicken sector, and has not fully recovered from the outbreak[12].

Market trends point towards an increase in demand for poultry meat. Poultry consumption is projected to significantly exceed both beef and pork consumption in Canada by 2020[13]. There is also continued consumer demand for drug-free poultry products and the reduced use of in-feed antibiotics, anticoccidials and growth promoters in poultry management and production. Other key public issues include concern for animal welfare relating to animal boredom, confinement, and restrictive environments. These are the primary complaints against “factory farming” by animal rights activists.

Perhaps the most significant challenge faced by the poultry sector in coming years is the cost of feed and energy. At present, feed grains are imported from other regions; use of grains for biofuels production is expected, and as oil prices rise, green fuel initiatives will compete with livestock sectors for feedstock.

[12] Zbeetnoff Agro-Environmental Consulting, 2009
[13] Serecon Management Consulting Inc., 2005

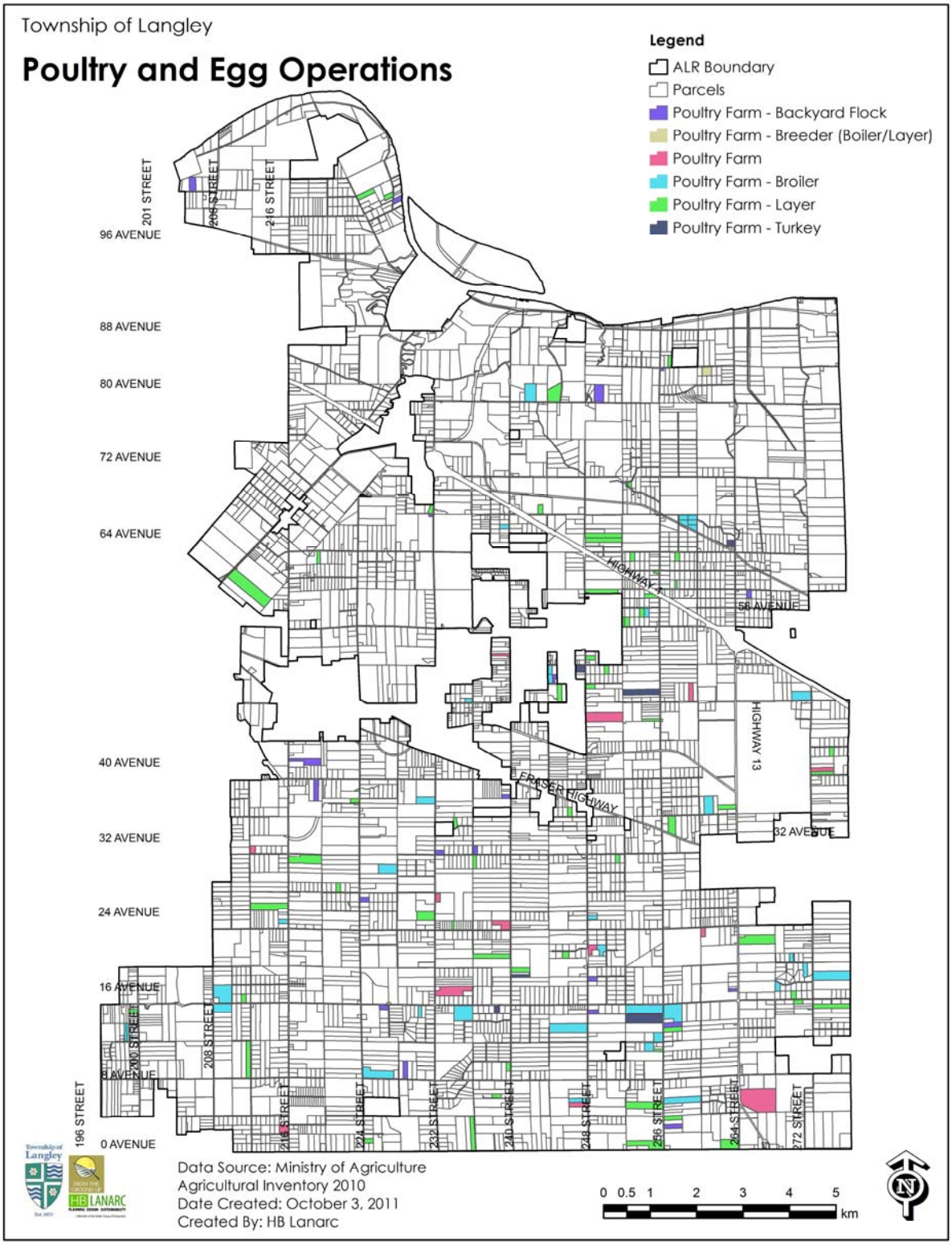


Figure 60. Poultry and Egg Operations, 2010

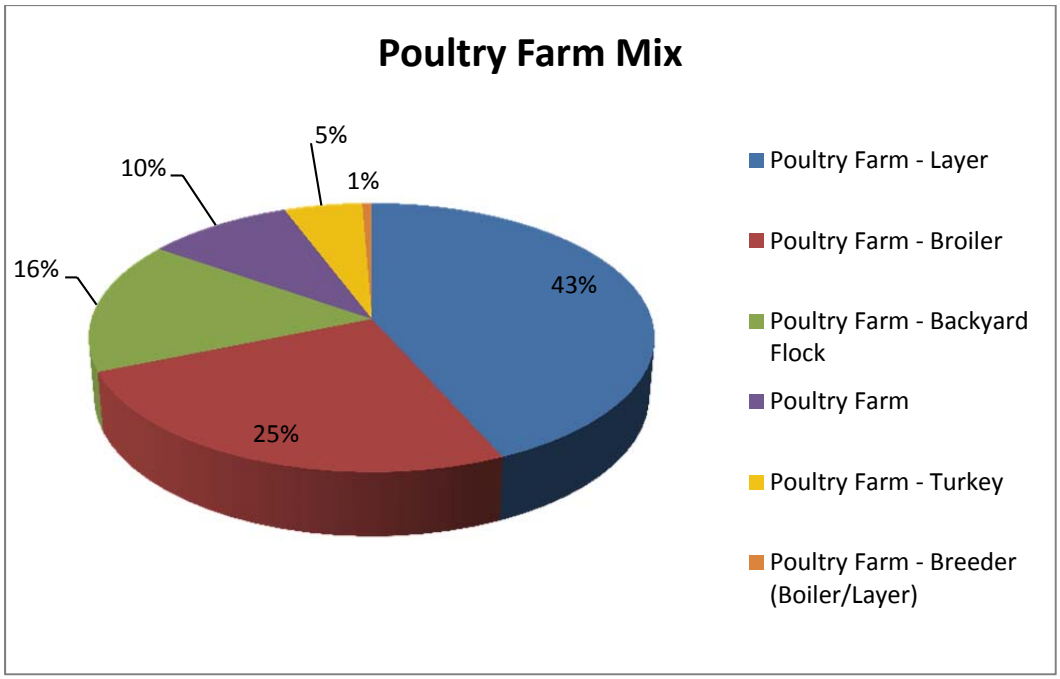


Figure 61. Breakdown of Percentage of Poultry Farms by Mix

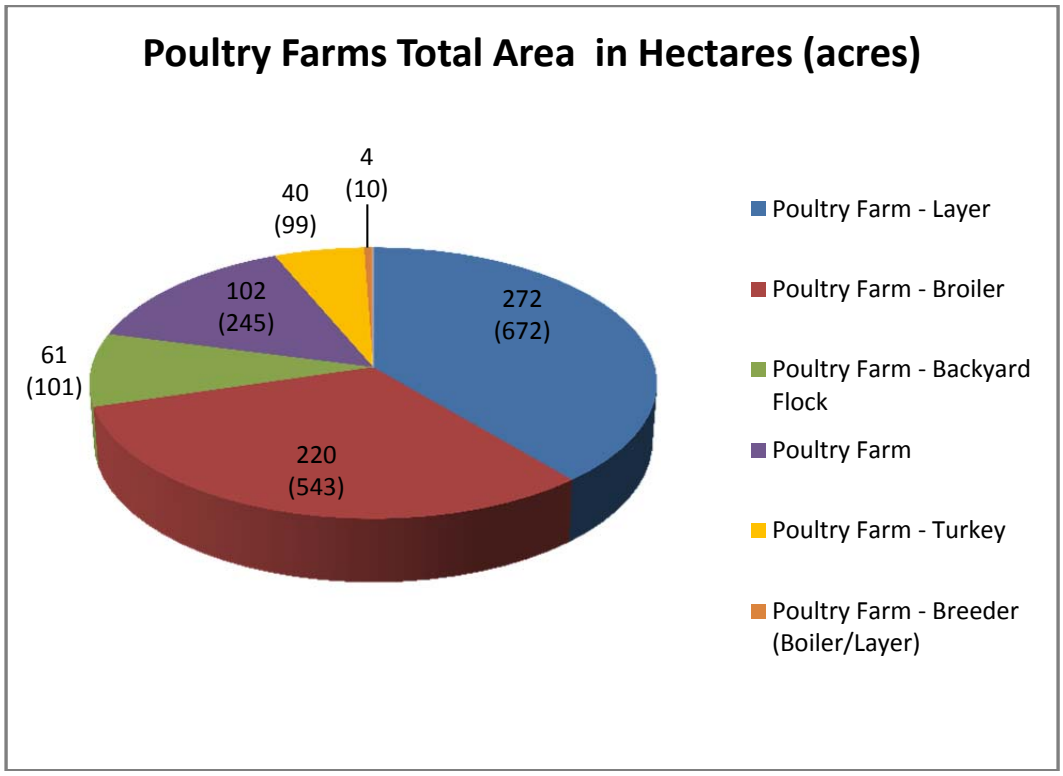


Figure 62. Breakdown of Poultry Farms by Total Area

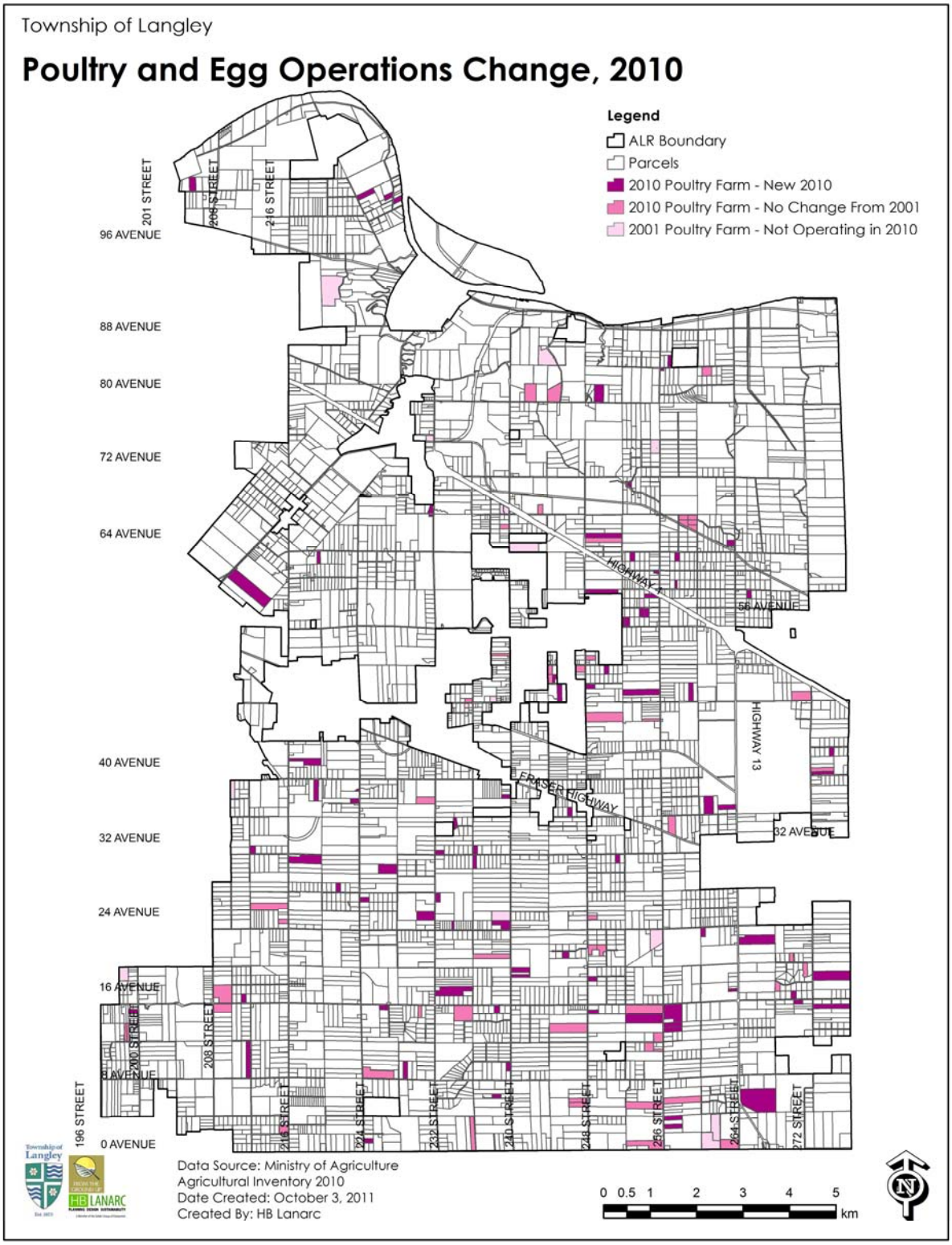


Figure 63. Poultry and Egg Operations Change, 2010

10.10. Sheep and Goat Farms

The fourth most common type of extensive livestock in the Township of Langley ALR is the raising of sheep and goats. There were a total of 53 farms within the ALR whose primary use was sheep or goat, shown in Figure 64. The majority of these operations were categorized as small to very small. 55% of sheep farms (Figure 65 and Figure 66) and 58% of goat farms (Figure 67 and Figure 68) were small size, 10 acres (4 hectares) or less. Most contained ancillary use of the property for other livestock. Table 15 show comparisons of goats and sheep farms by industry scale from the regional to national level.

Sheep can be raised on a small piece of land: 0.5 hectare (1.2 acres) of pasture can support 6 to 8 ewes. For this reason, many producers farm on a small, part-time scale.

A relatively new development in BC is the use of sheep for weed control in replanted forest clearcuts. Many of the sheep for the large flocks needed for this are obtained from BC and Alberta.

BC imports about 375,000 kg of sheep and lamb's meat each year[14]. There is an opportunity to replace this imported meat with locally grown production. However, the expansion of the lamb industry is constrained by a lack of infrastructure, transport, processing, and management interest among farmers.

Table 15. Sheep and Goat Farms by Industry Scale

Percent of Total Farms	Langley	Greater Vancouver	Lower Mainland-Southwest	British Columbia	Canada
Sheep farms	3%	2%	2%	2%	1%
Goat farms	1%	1%	1%	1%	0%

(Source: 2006; Statistics Canada, 2006)

Note: The farm type is based on the North American Industry Classification System (NAICS) farm-typing categories.

[14] BC Ministry of Agriculture and Lands, 2007

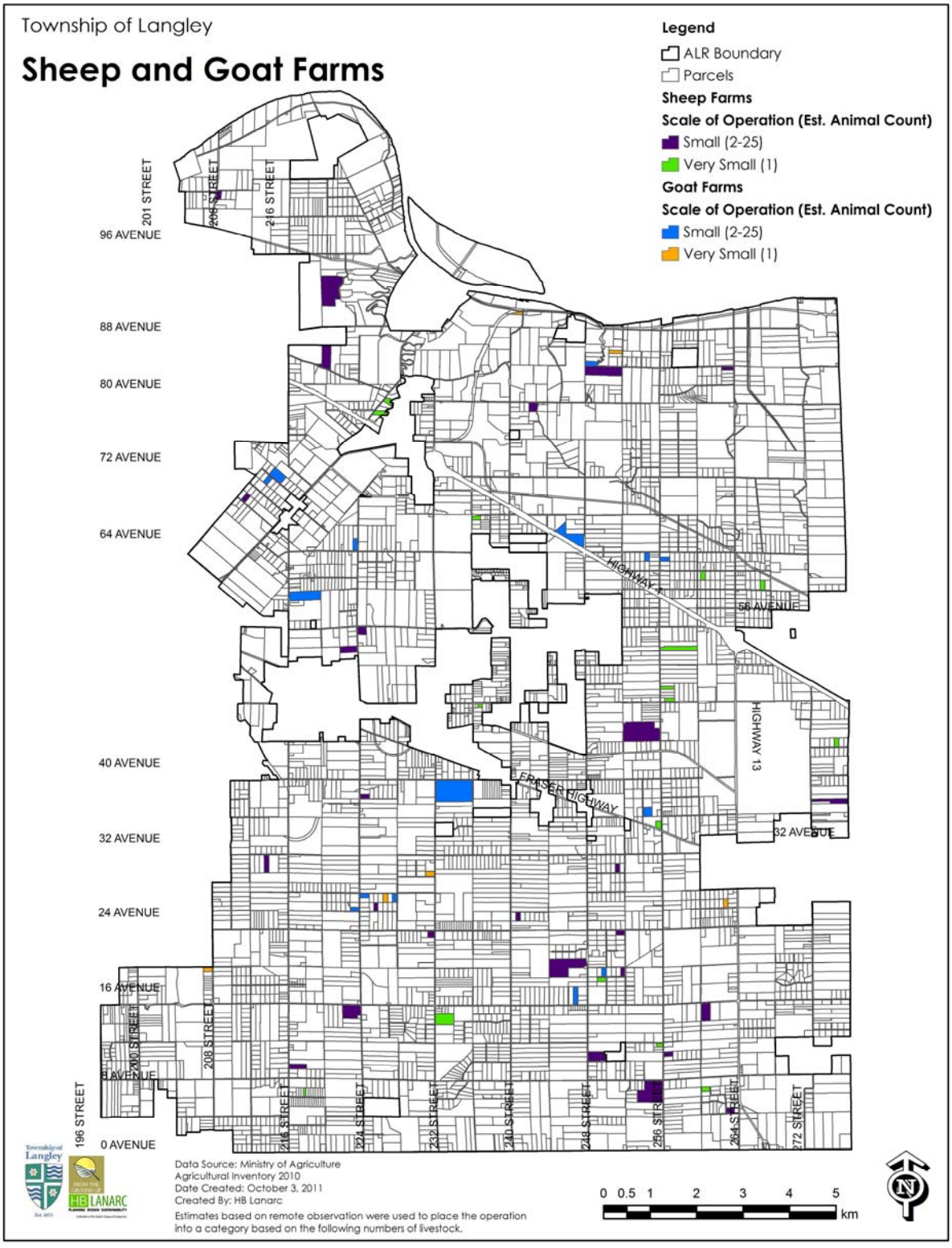


Figure 64. Sheep and Goat Farms, 2010

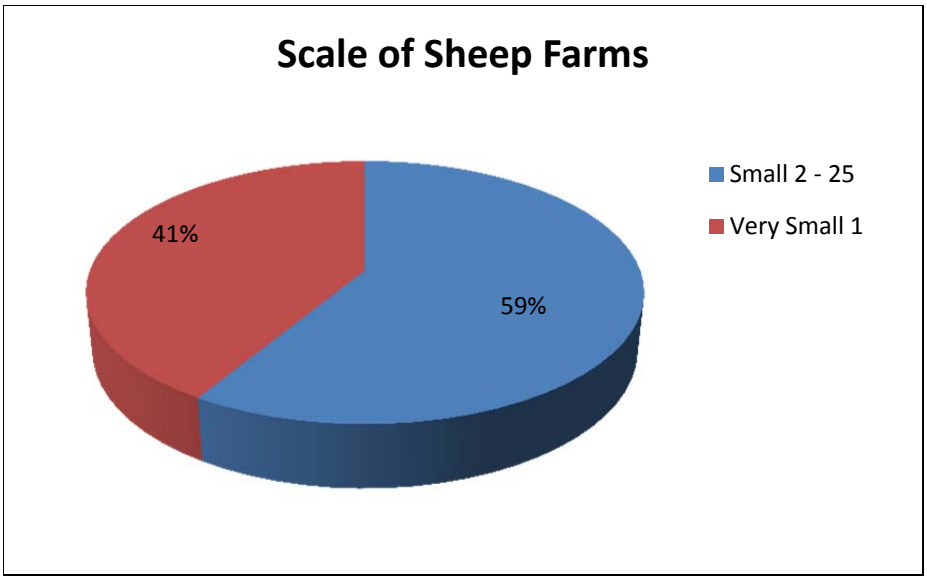


Figure 65. Breakdown of Percentage of Sheep Farms by Scale of Operation

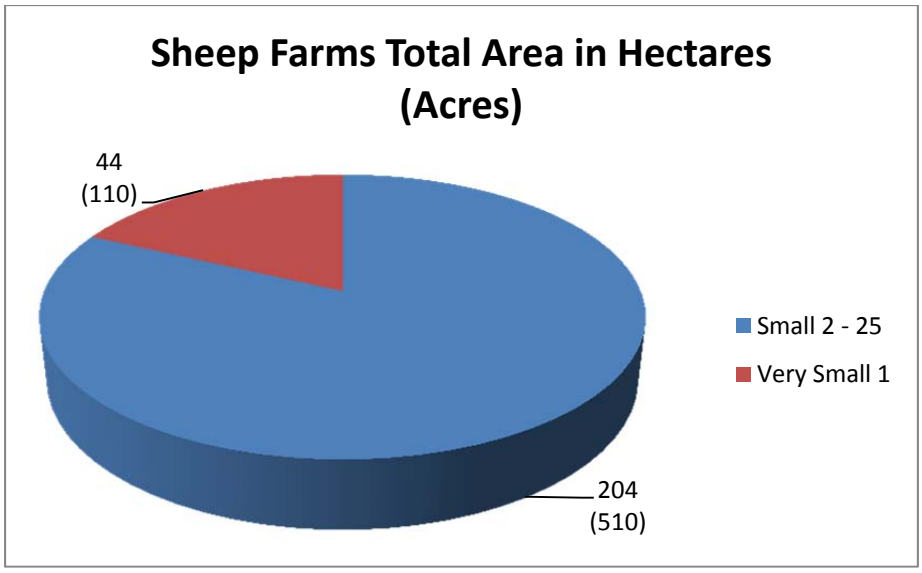


Figure 66. Breakdown of Sheep Farms by Total Area

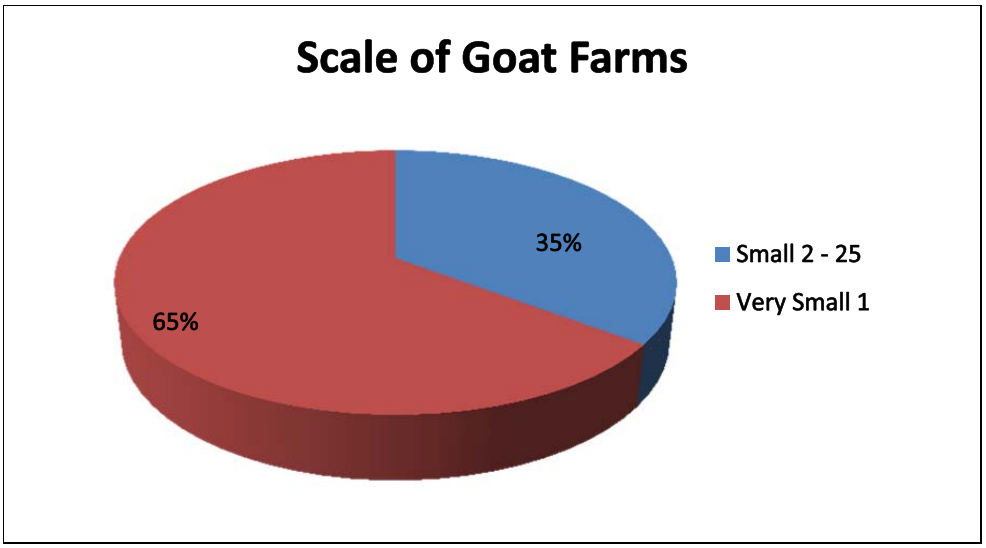


Figure 67. Breakdown of Percentage of Goat Farms by Scale of Operation

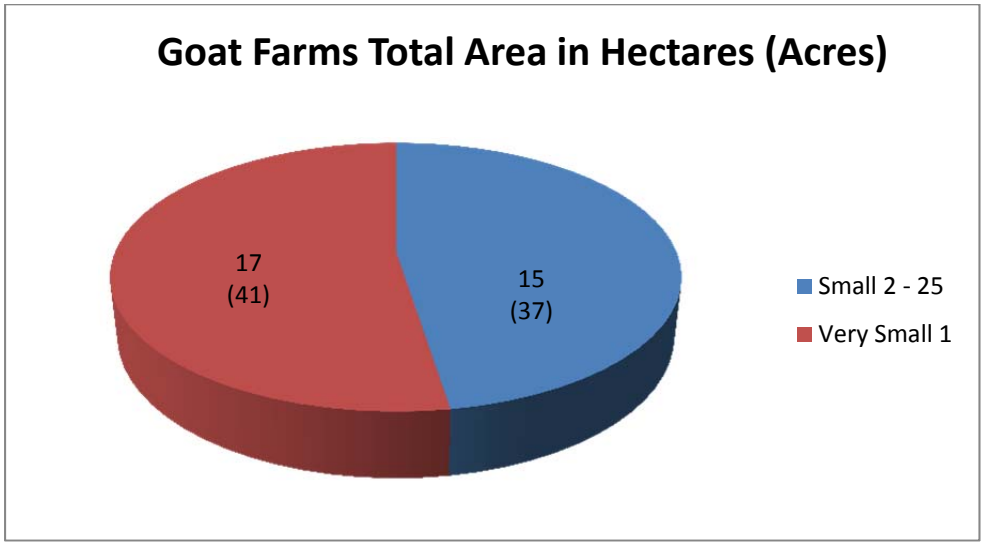


Figure 68. Breakdown of Goat Farms by Total Area

10.11. Hog Farms

The third most common type of intensive livestock in the Township of Langley ALR is swine operations. In 2010, there were a total of 4 farms within the ALR whose primary use was swine operations (Figure 69). At 14 hectares (35 acres), their average parcel size was relatively large compared to other agricultural uses. Note that this category does not include hobby farms with a small number of pigs.

The swine industry in BC has virtually disappeared in recent years. Production has moved to areas where input costs are much lower, notably the Prairie provinces where feed costs and land costs are a fraction of what they are in the lower mainland and concerns with manure handling are minimal.

According to the census, there has been a substantial decline in swine production in the Township of Langley over the past 20 years. In 1986, there were 84 farms reporting over 14,000 pigs. By 2006, this had declined to 39 farms reporting 3,749 pigs – a drop of 75%. Figure 70 indicates that there was little change in the number of swine farms in the Langley ALR from 2001 to 2007.

Most pigs in BC are produced near Vancouver in order to minimize transport costs to population centres when the hogs are sent to market. Close to 80% of market hogs are produced in the Fraser Valley[15].

Hog production is an intensive farming operation. Problems with waste management and disposal or with unpleasant odours can arise, especially if the swine operation is near residential areas.

[15] BC Ministry of Agriculture and Lands, 2007

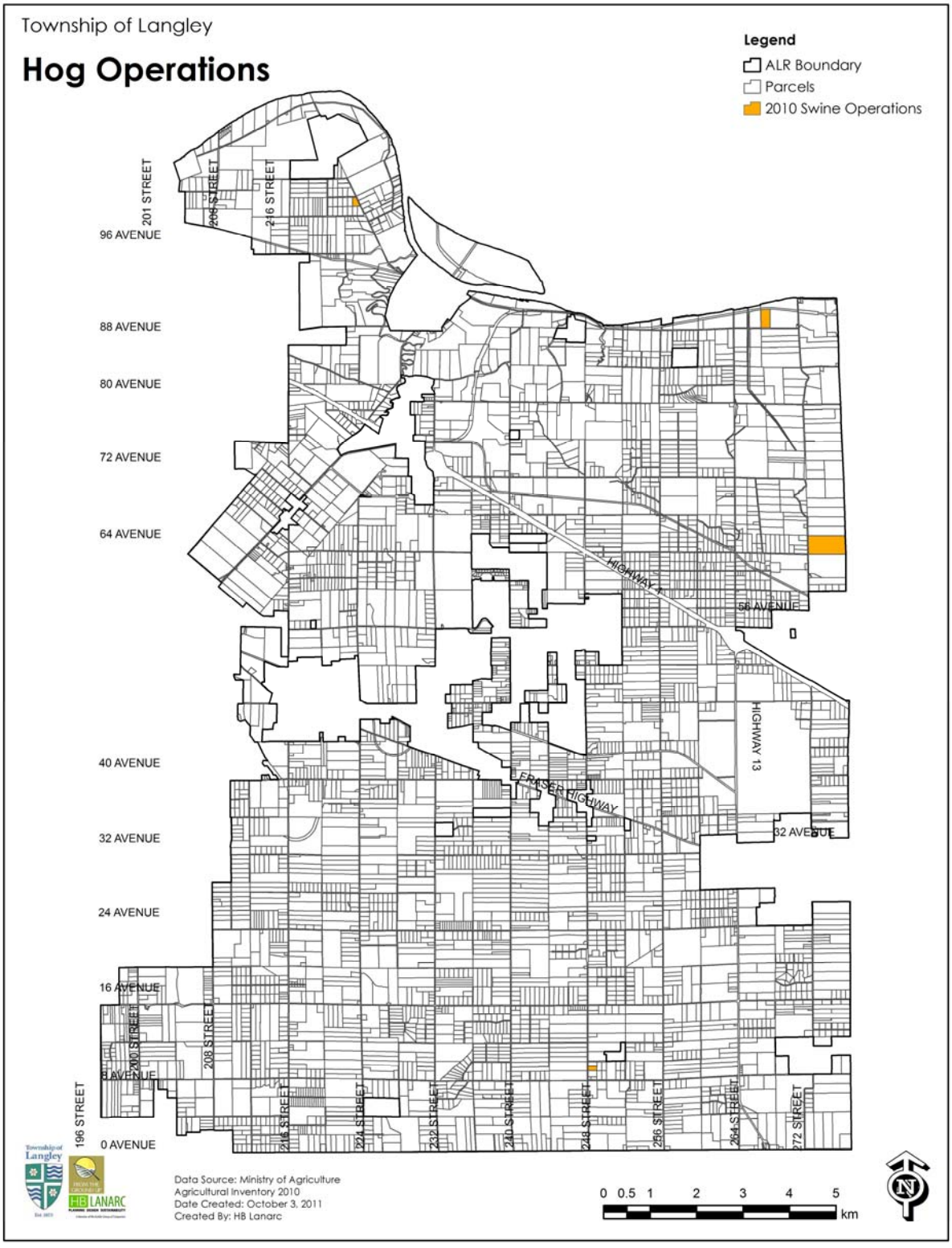


Figure 69. Hog Operations, 2010

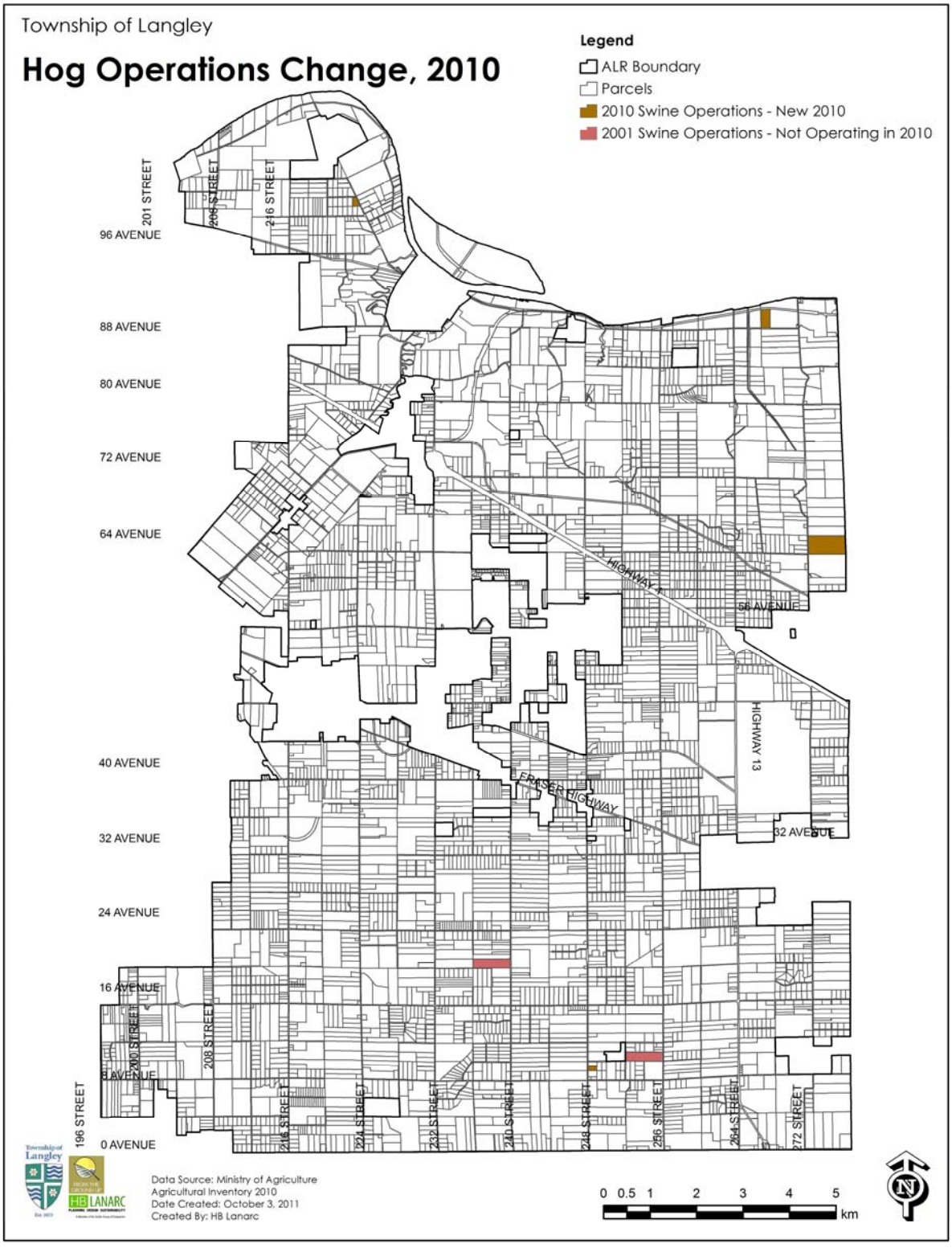


Figure 70. Hog Operations Change, 2010

10.12. Area of Changes Graph

Due to methodological differences between the 2001 and 2007 inventories and the 2010 inventory, it is not possible to completely evaluate the changes in operations between these three inventory years. The reasons for this are as follows:

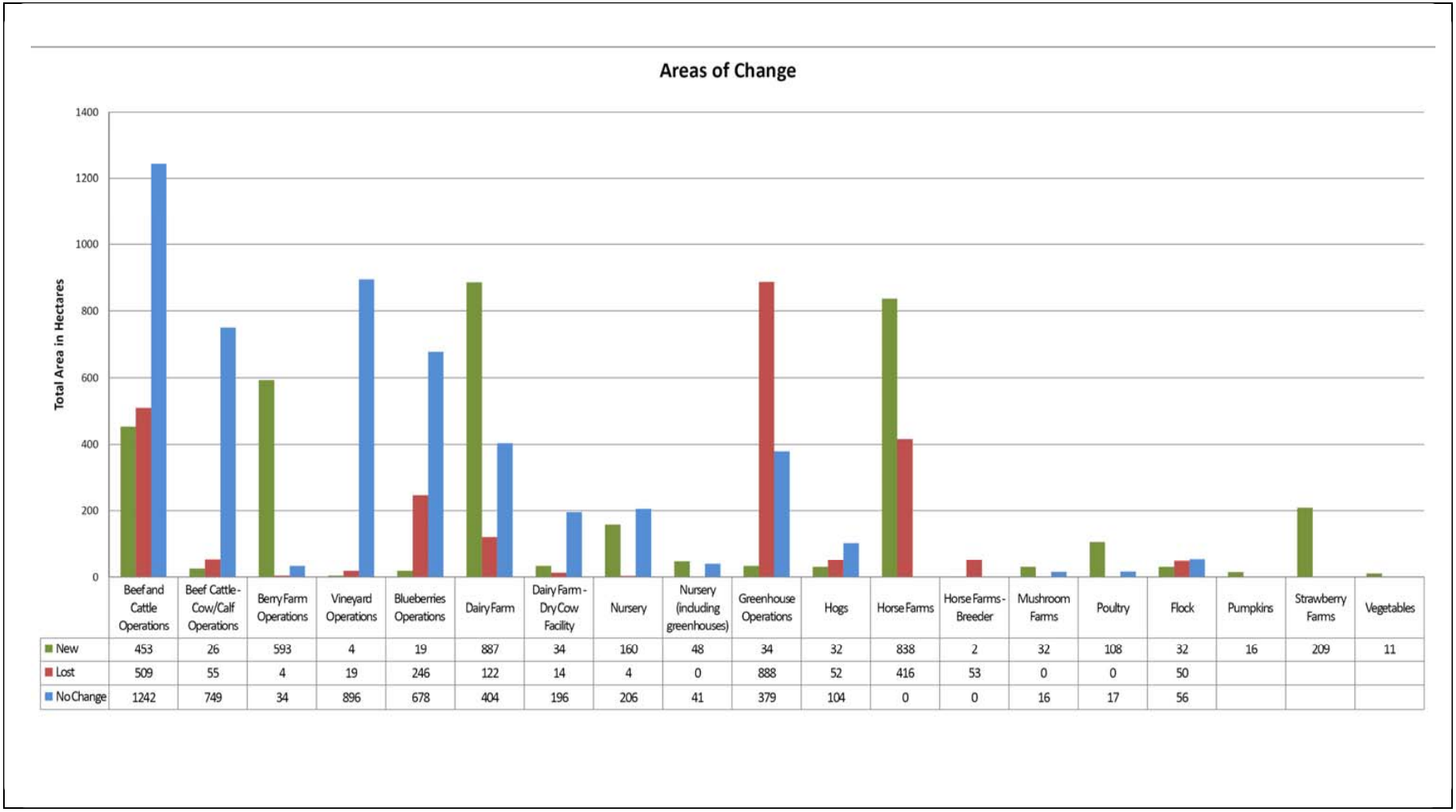
- While the 2010 inventory does record more than one land use per parcel, it does not prioritize land uses in order of dominance. As such, it is difficult to make a distinction between primary and ancillary uses and often a best judgement was made to determine the primary agricultural use.
- In addition to multiple land uses, a parcel in the 2010 inventory can also have multiple *land covers* which correspond to other agricultural uses, further complicating the assessment of primary agricultural use.
- The categorization of farm scale, including the cut-off between agricultural operations and hobby farms differs between the 2001 and 2007 inventories and the 2010 inventory. Accordingly, there may be a significant decrease in the count for various farm-scale operations in the most recent inventory

As both the 2001 and 2007 inventories were conducted using similar methodologies it is possible to compare the two and draw reasonable inferences from their differences.

Our analysis of commodities indicates that 403 parcels underwent some change in activity or practice between 2001 and 2007. 395 parcels had no change in activity and practice in the same period.

A majority of the land in new farm operations is dedicated to dairy and horse farming, 887 and 838 hectares (2,191 and 2,070 acres), respectively while a majority of the land lost to farming was in greenhouse operations (888 hectares). Beef and cattle operations still dominate the utilization of area followed by vineyards and blueberry farms. Small areas are utilized by poultry and flock, and mushrooms, which may be due to the nature of these facilities (i.e. small land base requirements). Pumpkin and vegetable farms also use small land areas which may be due to the lack of frequency and/or reporting in the ALR.

Figure 71 summarizes the values of commodity change by area.



	Beef and Cattle Operations	Beef Cattle - Cow/Calf Operations	Berry Farm Operations	Vineyard Operations	Blueberries Operations	Dairy Farm	Dairy Farm - Dry Cow Facility	Nursery	Nursery (including greenhouses)	Greenhouse Operations	Hogs	Horse Farms	Horse Farms - Breeder	Mushroom Farms	Poultry	Flock	Pumpkins	Strawberry Farms	Vegetables
New	453	26	593	4	19	887	34	160	48	34	32	838	2	32	108	32	16	209	11
Lost	509	55	4	19	246	122	14	4	0	888	52	416	53	0	0	50			
No Change	1242	749	34	896	678	404	196	206	41	379	104	0	0	16	17	56			

Figure 71. Area of Change Graph

11. Conclusions

The Township of Langley is one of the richest agricultural areas in the Lower Mainland, province and indeed, Canada. With natural capital such as high quality soils and ideal climate for farming, agriculture in Langley will persevere and continue to be part of the community and regional economy for the foreseeable future.

As this Agricultural Profile demonstrates, the potential for expanding agriculture into new exciting areas as well as supporting existing forms of food and fibre production will enable Langley to be the benchmark for what is possible through sustaining a resilient farm sector. As we enter into an era of economic, climactic and demographic uncertainty, the strength and resilience of Langley's farm sector will not only contribute to regional food security by producing more food that is bought and eaten locally, but also continue to be a major economic driver for the region.

Clearly, the agriculture industry is economically, environmentally and socially important to the Township of Langley. It makes a major economic contribution and occupies 75% of the land base. Agriculture in the Township produces a significant portion of the region's food supply as well as providing valuable green space and habitat. The climate, resources and proximity to Vancouver are very positive factors for the long term health of agriculture in the Township.

The local agriculture industry in the Township of Langley is experiencing significant change. Many types of commodity operations are being, or have been, squeezed out as input costs have increased and product prices declined. Dairy and pork production has moved to areas with lower input costs and lower land prices. Commodity mushroom and vegetable production has also shifted to other areas over the years. These enterprises have been replaced with intensive horticulture - mainly nurseries, greenhouses and, to some extent, berries.

There are also new and emerging opportunities related to agri-tourism, direct marketing, organic and niche market production, as well as those linked to greenhouse gas reduction.

Diversity is a key character of agriculture in the Township of Langley; hundreds of different types of products are created. The scale of operations varies from very small to multimillion dollar enterprises while the nature of farms ranges from pure lifestyle and recreation to pure business. Product distribution ranges from agri-tourism and direct farm markets to complex distribution systems serving export markets. As well, the Township has a healthy mix of certified organic and conventional farm operations.

It will be very important to identify the most important factors in agricultural success, and incorporate them into a vision for the industry. The vision and strategic direction will help the Township set policies and allocate resources to deal with some of the key challenges to the farm sector.

For instance, one issue identified through the inventory is increased pressure on water resources. Continued expansion of the local agriculture industry inevitably means increased demand for water. A large portion of the local water supply comes from groundwater, which currently has no legislative controls. Without these controls and regulations on water, the increasing demand and shrinking supply is a key challenge for the future of agriculture in the Township as well as other areas of the Lower

Mainland and British Columbia. Policies may be needed to ensure that the available water is used efficiently, and in accordance with the overall direction of the community and region.

The related challenges associated with contamination of surface and ground water sources by agriculture must also be considered in developing strategy and policy directions for the farm sector. Water quality becomes a concern in areas where there may be heavy use of manures, chemical fertilizers and pesticides, or where livestock have direct access to water. Water courses provide drainage channels to remove excess water from farmland, which allows increased productivity and food production. Environmental farm planning can help identify areas of concern and develop improvements to prevent contamination. Farmland can also be impacted by runoff from upland development. Given the importance and pervasiveness of watercourses throughout the Township that provide valuable habitat for fish, waterfowl, and wildlife, management of the interface between farms and aquatic areas are of key importance to the long-term health of both ecosystems and farms.

The future of the agricultural areas must be viewed through the lens of sustainability and integrated food systems. The ALR does not function as an isolated unit within the region, but rather as an integrated section of the Township. As such, it is responsive to cultural, political, economic, and environmental changes within both the ALR as well as the urbanized portions of the Township. For instance, increased upwards pressure on land values from the urbanized edges of the land base will continue to raise costs for farmers as well as fuel speculation within the ALR.

In conclusion, this document should be recognized as a foundational piece for the Agricultural Viability Strategy. It is important that the information contained within this document is used, analyzed and incorporated into all future stages of the process. With increased knowledge surrounding agriculture in the Township, it can be assured that the decisions made surrounding the future of agriculture will ensure positive outcomes for the entire community.

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Appendix A Value-Added Agricultural Operations

Value-Added Agricultural Operations

ID	Name
1	Door to Store
2	Gems Farm & Rabbitry
3	Arts Nursery
4	Adamon's Heritage Nursery
5	ADJ Greenhouse
6	Aldor Acres
7	Annie's Orchard
8	Apaloose Horse Ranch
9	Art's Nursery
10	Avina Fresh Mushrooms
11	Barbara Boldt Studio
12	Bhangal Blueberry and Strawberry Farm
13	Blueberries Hill Farm
14	Bridge Meadow Farm
16	C & T Mushroom Farm
17	Canadian Valley Growers
18	Canadian Valley Growers
19	Chicken Hill
20	Chu's Farm
21	Clingan Blueberry Farm
22	Coast Cranberries Ltd.
23	Country Christmas Noble Trees
24	Critter Clinic Wildlife Society
25	Dave's Orchard
26	Davidstead Farm
27	Davidstead Farm
28	Davidstead Farm
29	Davidstead Farm
30	DeVry Greenhouses LTD.
31	Dogwood Christmas Tree Farm
32	Ennis Farm Meats
33	Equestrians Unlimited Association
34	Equine-imity
35	Fairway Farms
36	Fort Wine Company
37	Fox Croft
38	Fraser Valley Auctions
39	Frocklage Farms
40	Fullbloom Farm
41	Garnet Farms
42	Neck of the Woods Winery

43	Goldwing Ostrich Products
44	Grandison Meadows
45	Green Hill Farms
46	Greenhouse PhotoGraphix - sign
47	Ground Effects Wholesale Nurseries Ltd.
48	Harmsworth Hall
49	Hart Poultry Ltd.
50	Harvey's Christmas Tree Farm
51	Horizon Landscape Contractors
52	Iberg Farms
53	J & D Cedars
54	Kavanah Stables
55	Keenebridge Farm
56	Langley Animal Structure
57	Langley Elks and Marieville Children Centre
58	Langley Golf and Banquet Centre
59	Langview Farm (1921)
60	Lavender Lane
61	Lazy 8 Farm
62	Lochiel
63	Los Vientos
64	Mainland Floral - Trans Floral - Ball Seed
65	Meadowland Farm
66	Meddcreek Farms
67	Milner Farm Market / Hometown Hay and Feed
68	Milnern Downs - Equestrian Facility
69	Mojo Himalayans
70	Moon Shine Horse Stable
71	Mountainview Conservation Society
72	Murray Creek Ranch
73	NG Nair Place
74	Nicomekl Enhancement Society Hatchery
75	Nijjar Greenhouses LTD.
76	Nijjar Greenhouses LTD.
77	Origin Organic Farms Inc.
78	Pond's Beautiful Aquatic Gardens
79	Rain Forest Nursery
80	Rainbow Garden Farm Market
81	RDM Enterprises Ltd.
82	Red Trees Farm
83	Riverhouse Farm
84	RK Arabians
85	Rossdown Farms
86	Rotary Field House
87	S & P Farms
88	S. Balducci Christmas Tree and Blueberry Farm

89	South Alder Farms Ltd.
90	South Carvolt Environmental Elementary School
91	Sterling Farms - Llamas Nad Alpacas
92	Stonewall Kennel
93	Sugarlane Welsh Mountain Ponies
94	SuitsUs2 Stables
95	Sunny Riding Stables
96	Sunrise Meadow Farm
97	T & G Nursery
98	The Family Farm
99	Thomas Reid Farms
100	Thoroughbred Training Centre
101	Thunderfoots Studio
102	TJ Pet Grooming
103	Township 7 Winery
104	Tuscan Farm Gardens - Apothecary Shop
105	Twin Creeks Ranch
106	Valley View Tree Farm
107	Valli Nursery - Cedars Hedging - sign
108	Vista D'oro Farms
109	West Creek Farms
110	Western Turf Farms LTD
111	Willpower Stable
112	Windsor Stables

Appendix B - Climate Mapping and Climatic Forecasting

Of particular importance to agriculture in the Township of Langley are the current effects of climate and the future effects of climate change. As has been previously mentioned in this document, the Township is situated in a relatively benign climatic region. However, there are mico-scale climatic variations that can affect agriculture. The subsequent six figures each display different aspects of present climatic conditions.

While it is not possible to conduct a full analysis of this data, it is presented with the intent to introduce the readers of this document to the possible applications of this information in future phases of the Viability Strategy.

Figure 72 displays collected mean annual temperature from the period 1990-2000 for the Township displayed as a colour gradient. The data displayed has been sourced from weather stations across the Lower Mainland and Whatcom County and is enriched with elevation information supplied by the Township. The information displayed on this figure can be used in future phases to assess suitability of agricultural land for various uses, as well as inform discussions on annual growing days. In addition, mean annual temperature can be combined with mean annual precipitation (Figure 73) to create a map climatic moisture deficit (Figure 74).

Figure 73 displays collected mean annual precipitation from the period 1990-2000 for the Township displayed as a colour gradient. As is shown on the map, there is significant variation in levels of precipitation with some areas in the north of the Township experiencing 22% higher levels of precipitation than areas in the south. In future phases of the Viability Strategy, precipitation mapping, which can also be displayed by season, is critical for evaluating water balance and crop selection. When combined with soil limitations, certain areas can be sited for enhanced irrigation practices. In addition, precipitation mapping can be combined with impervious areas analysis to understand rainwater discharge and aquifer recharge.

Figure 74 displays the annual average climatic moisture deficit for the decade 1990-2000. Of particular importance to hydro-geomorphic processes is the climatic moisture regime, which reflects the balance between the precipitations falling on an area and the evaporative demand for water. The evaporative demand is a function of solar radiation, air temperature, humidity, and wind speed, and is represented by monthly reference evaporation. Therefore, the climatic moisture deficit equals the monthly reference evaporation minus the monthly precipitation.

This map could be combined with land cover, agricultural use and soil moisture deficit to produce a map showing net annual demand for water resources. However, as a standalone product this map displays areas which have increased demand for water resources irrespective of agricultural product or practice. Thus, this map could serve as a basis for some land use decisions that impact water balance.

As a supplement to the current climatic mapping, three figures have been included to show the potential effects of climate change based on the HadCM3[16] climate change model. Given the importance of climate for agriculture, future phases of the Agricultural Viability Strategy should directly

[16] HadCM3 (abbreviation for Hadley Centre Coupled Model, version 3) is a coupled atmosphere-ocean general circulation model (AOGCM) developed at the Hadley Centre in the United Kingdom. It was one of the major models used in the IPCC Third Assessment Report in 2001.

address the changing influence of climate within the Township, and frame the discussion within a framework of climate change. However, before each figure is assessed, there are some important assumptions to note:

- The HadCM3 model has been enhanced and calibrated to the present climate model based on local weather stations, and spot elevations.
- Future climate change scenarios are very useful from a policy perspective to make interventions and long range planning, but spatial representation is not guaranteed (micro-scale climate variations).
- Finally, precipitation events are not captured in the abovementioned forecasting model.

With the above provisos in mind, it can be noted that each of Figure 75, Figure 76 and Figure 77 show a possible future scenario in 2050 wherein climate change has occurred. Figure 75 displays the future mean annual temperature gradient across the Township. When compared to Figure 72 it is apparent that the average mean annual temperature has been elevated by an average of 2°Celcius. Potentially, an increase in temperature can affect growing days for crops, water needs, and crop selection. By leveraging an understanding of future temperature effects, agricultural planners and operators can mitigate risk and complete long term plans.

Similar to Figure 75, Figure 76 displays future precipitation volumes across the Township. Essentially, as predicted by the climate model, there may be a decrease of around 55 annual millimeters of rain for the area. The reduction in rainfall volumes will likely affect water balance and irrigation draws. In addition, reduced rainfall may affect crop selection and growing times especially for water-intensive crops such as blueberries and cranberries.

Finally, displaying future annual climatic moisture deficit, Figure 77 completes the analytical picture and displays a future scenario wherein the effects of climate change are most visible. If, indeed annual precipitation drops and temperatures rise, there will be a possible doubling in the climatic moisture deficit. With an increase in annual climatic moisture deficit comes increased irrigation draws as well as shorter growing seasons and less predictability in yearly yields.

While the abovementioned maps show possible future climate effects, they are only displaying one of many climate models. Other models may display different outcomes and intensities of change. However, regardless of which model is used, by viewing, understanding, and incorporating the possible effects of climate change into the planning process, risks to agriculture may be mitigated.

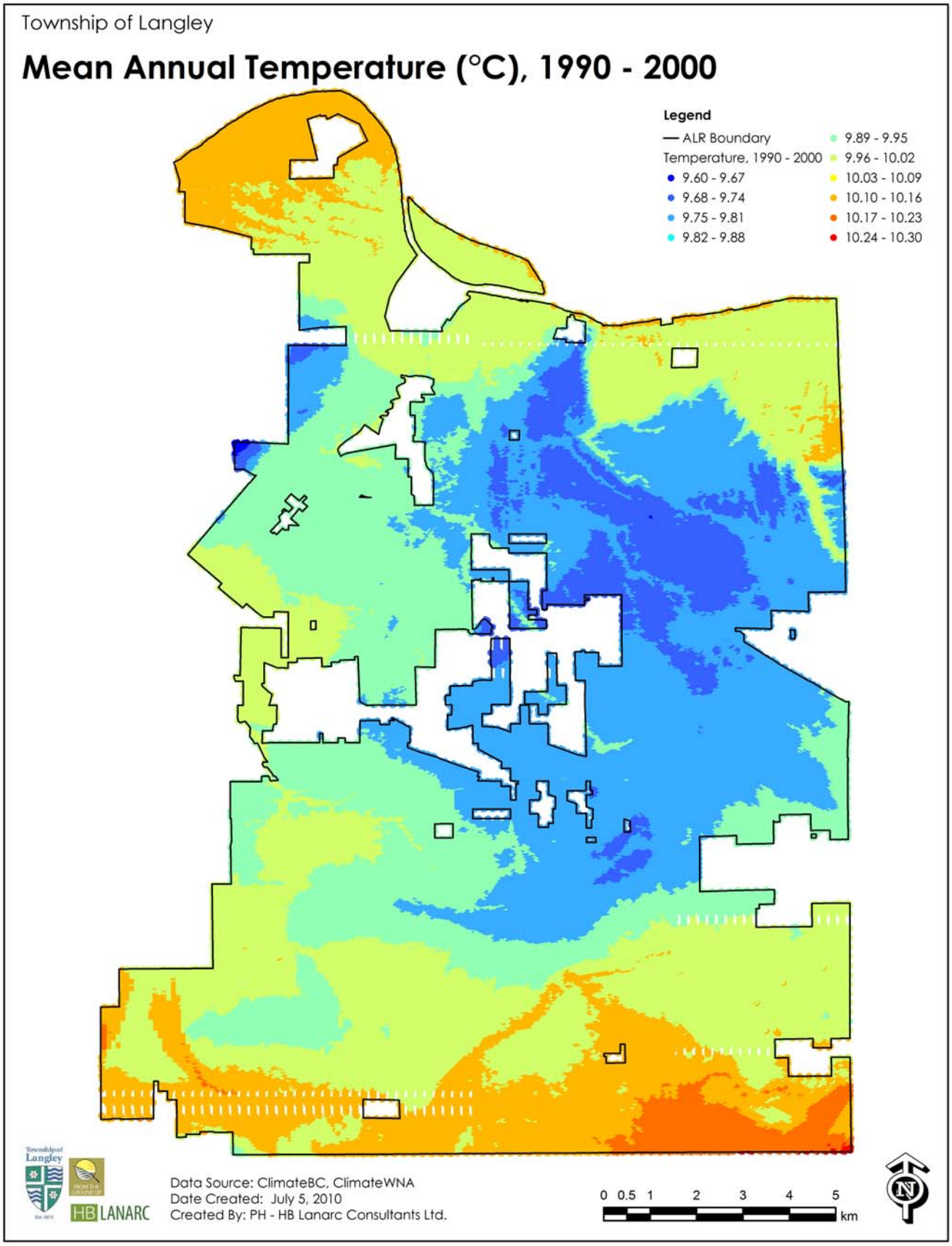

Figure 72. Mean Annual Temperature, 1990-2000

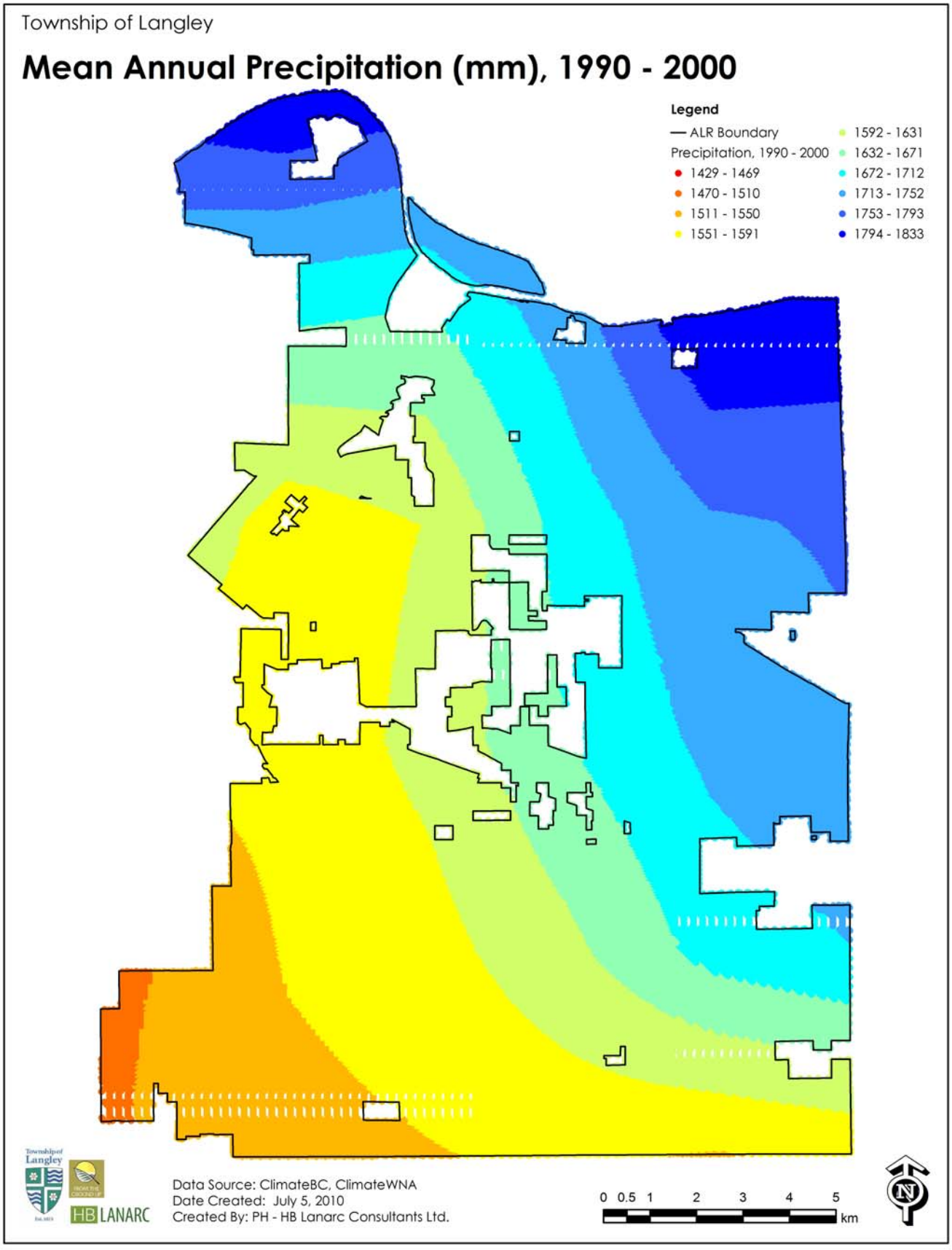

Figure 73. Mean Annual Precipitation, 1990 - 2000

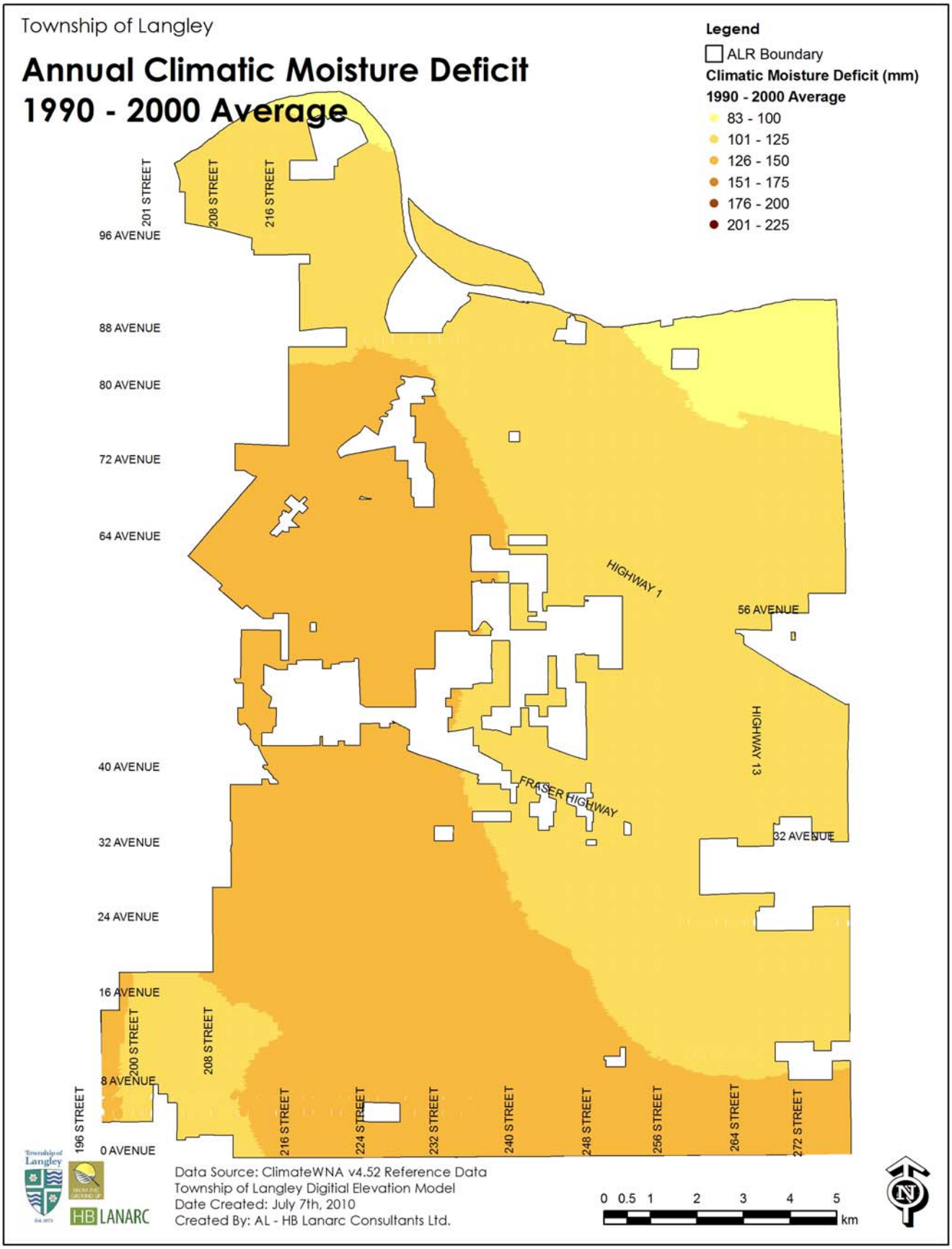

Figure 74. Annual Climatic Moisture Deficit, 1990 - 2000 Average

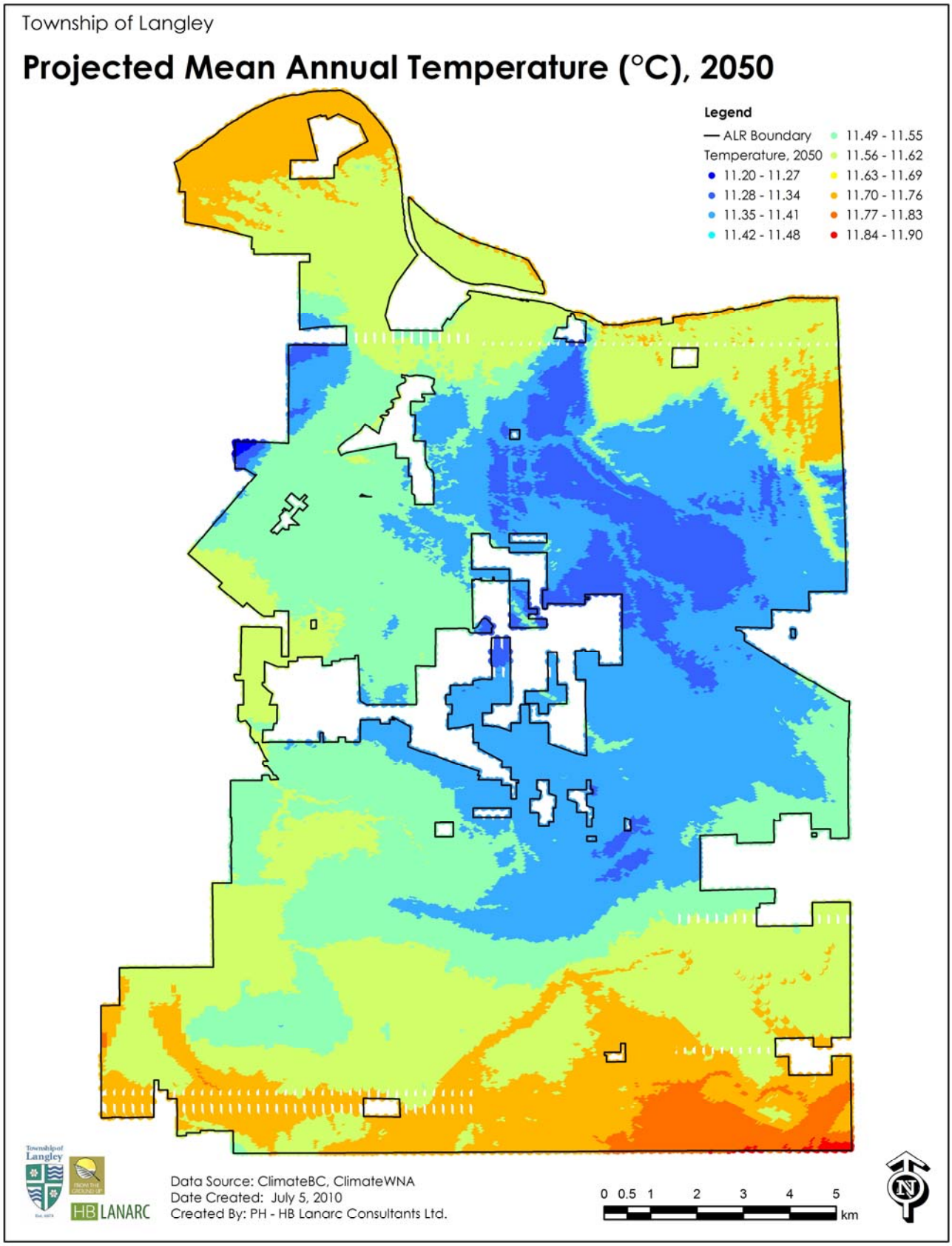

Figure 75. Projected Mean Annual Temperature, 2050

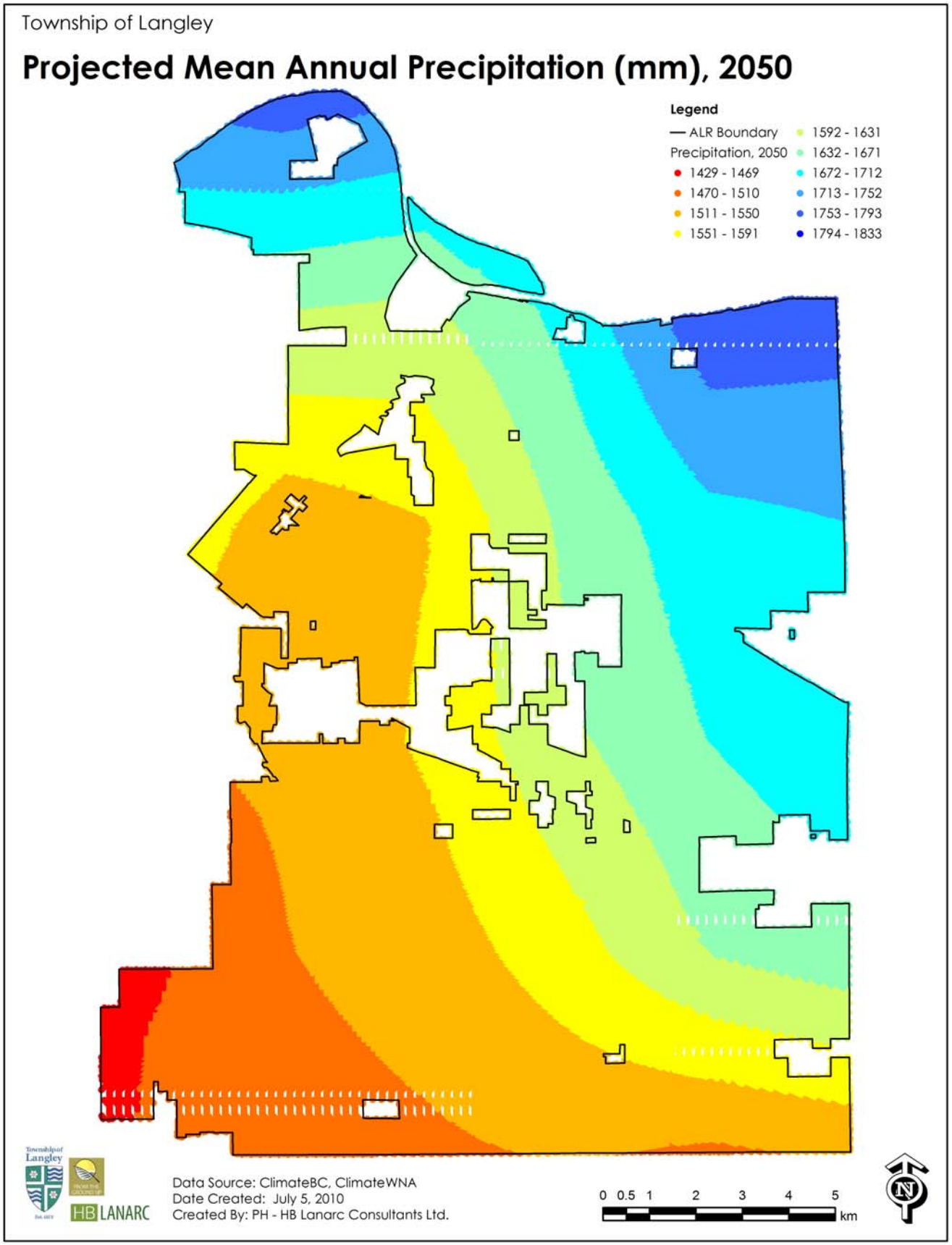

Figure 76. Projected Mean Annual Precipitation, 2050

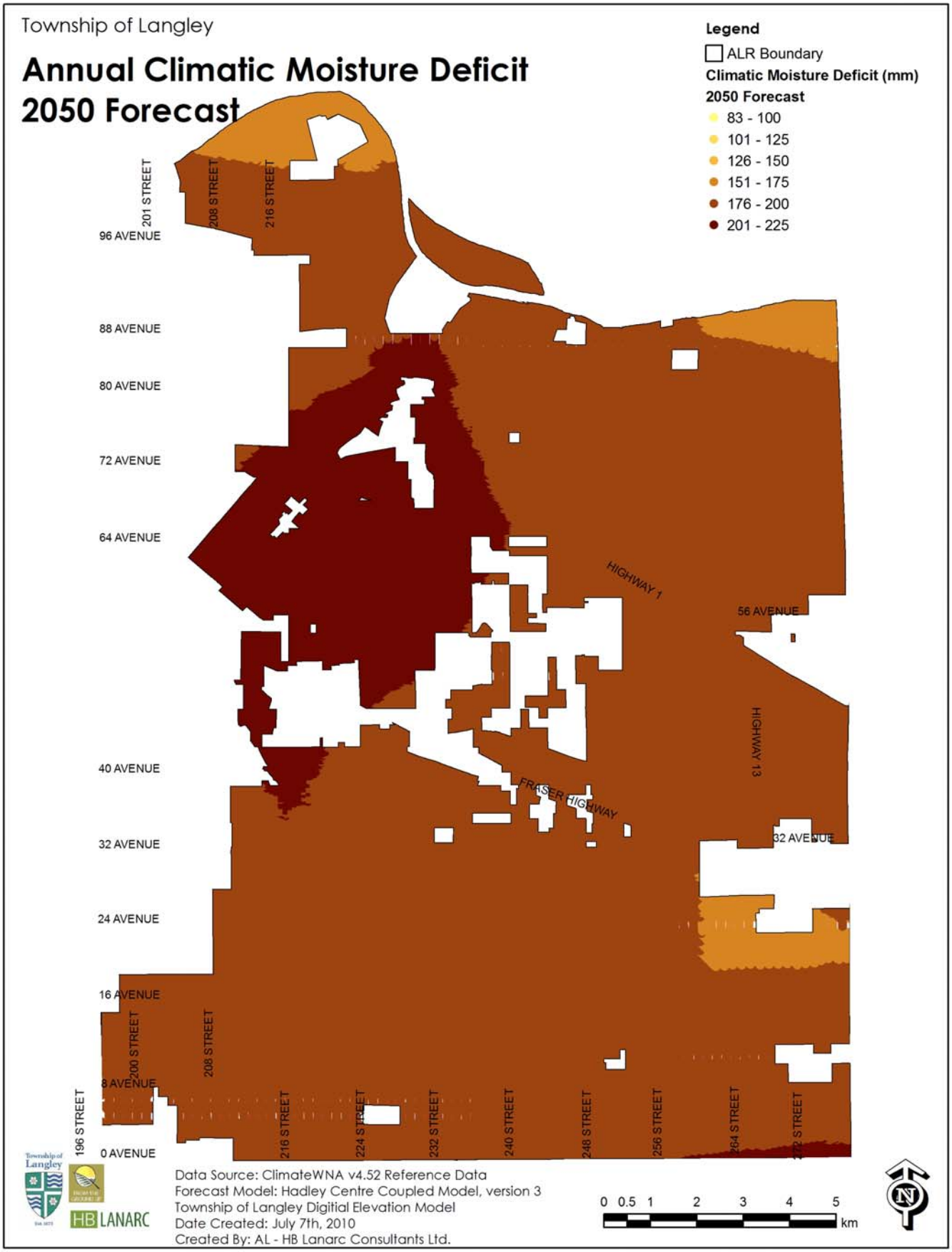

Figure 77. Climatic Moisture Deficit, 2050 Forecast