



Manitoba's Soybean Processing Opportunity Summary Document

April 27, 2018

WOLG

Westman Opportunities
Leadership Group

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LETTER OF INTRODUCTION

The future is bright for soybeans in Manitoba. Recent growth in the acres planted to soybeans in Manitoba and Saskatchewan shows strong and continuing interest in this crop. Growth in key markets for soymeal and soy oil points to growing demand. These factors, and Manitoba's open for business attitude, has led to our group actively pursuing the attraction of a major soybean facility to this Province.

In 2016 the Westman Opportunities Leadership Group (WOLG) was established to attract a world scale soybean processing facility to Manitoba. The WOLG is not seeking to build a facility—it seeks to attract a sector-leader to Manitoba to establish the facility. This investment holds significant potential to expand the Regional economic base, will help preserve and grow related industries, and will lead to significant value added downstream investment and local job creation.

The WOLG is a consortia of farm, business and community leaders. Five communities are leading the way—Brandon, Carberry, Neepawa (NADCO), Russell-Binscarth and Virden (Dennis County Partnership). Many local municipalities also have provided support to our process. Each community believes a strong, coordinated approach to the investment attraction process is the best way to ensure a facility is developed here in Manitoba. They also recognize that while there is expected room for only one facility, they are committed to work for the common good of all, knowing that broad support is required, and knowing that a facility located anywhere in Manitoba benefits all of Manitoba.

Since the fall of 2016 our work has been extensive, with much attention focused on a November 2017 workshop where the plant was discussed in detail. Those attending agreed that the opportunity is real, and should be pursued with vigor. Much work has taken place since the conference—the WOLG launched a major design process to build a very open and widely supported Investment Attraction strategy. They mandated a Design Team to create a detailed Investment Attraction process to bring a plant to Manitoba; their work was completed in March, 2018.

This document brings together the key findings from the conference and describes the Investment Attraction Strategy. We believe this document accomplishes two things—it describes the opportunity in enough detail to interest potential plant builders, and it confirms the willingness of all involved communities to work together and with potential builders to make a Manitoba plant a success.

Additional materials are available at the Brandon University - Rural Development Institute website: brandonu.ca/rdi/attract-soybeans-mb/resources. We are thankful for the strong support provided to us through Brandon University and the Rural Development Institute. As a volunteer organization, we rely upon their good offices to provide logistic oversight, administrative support and academic leadership as we pursue this major investment. The importance of their participation cannot be underestimated.

These are exciting times, and we look forward to growth in Manitoba's soybean industry. If you would like more information, please contact us through the RDI website at soybeansinfo@brandonu.ca.

Sincerely,

**Ray Redfern,
WOLG Chair**



01 INTENT

On November 16, 2017 the Westman Opportunities Leadership Group (WOLG) hosted a workshop—Soybean Building Opportunities—in partnership with the Rural Development Institute (RDI) of Brandon University. The workshop discussed the emerging opportunity to establish a soybean processing facility in Manitoba. It brought together leading agricultural experts from Canada and the United States that spoke to the full soybean supply chain, facility profile and challenges and opportunities.

This document brings together the key findings from the conference and describes the Investment Attraction Strategy now underway. The document accomplishes two things—it describes the opportunity in enough detail to interest potential plant builders, and it confirms the willingness of all involved communities to work together and with potential builders to make a Manitoba plant a success.

The Westman Group—Origins

The Westman Opportunities Leadership Group (WOLG) has been established to lead an investment attraction initiative to attract a major soybean processing facility to Manitoba. This facility will expand Manitoba's economic base, will help preserve and grow related industries—with a focus on the hog sector, and will lead to significant value added downstream investment and regional job creation.

The Leadership Group

Formed in 2016, the Leadership Group is comprised of farm, business and civic leaders from Manitoba. The WOLG is not seeking to build a facility—it seeks to attract a sector-leader to Manitoba to establish the facility. It is a strategic leadership and advisory group, with a core mandate to support investment attraction by:

- Overseeing the ongoing investment attraction efforts that are being established,
- Liaising with various levels of government to advance the opportunity,
- Liaising with key corporate officials when necessary to present the opportunity,
- Using their individual and collective influence to open results, and, necessary doors and assist to ensure positive results,

- Delivering long term community capacity that will apply the learnings from the soybean process to other development opportunities in the Region.

Brandon University

Through agreement, the Rural Development Institute at Brandon University has agreed to be the agent of record to deliver the investment attraction process. Broad responsibilities include funding and project oversight, logistics and accounting and applying intellectual rigor to ensure the products delivered meet the anticipated needs of the industry. They also will be integral to the meeting and the Investment Attraction process by helping host and liaise with prospective companies alongside the WOLG.

Community

Community participation is central to long term success. Today, participants broadly fall in two groups—those that feel they are potential locations for a processing facility, and those that seek to coordinate development efforts with value added spin off opportunities (like construction, hog sector expansion, etc.). Funding support reflects this grouping. RM and community council resolutions and letters received to date confirm broad support.

WOLG Board Members

Ray Redfern, Rivers, MB, Chair of WOLG. Owner and CEO of Redfern Enterprises	Allan Preston, Hamiota, MB, Vice-Chair
Owen McAuley, McAuley, MB	Stuart Olmstead, Carberry, MB
Barry Routledge, Lenore, MB	Scott Lamont, VP Administration & Finance, Brandon University
Dale McKay, Brandon, MB	Dustin Williams, Souris, MB
Sandy Trudel, City of Brandon, MB	Nick Foisy, Russell-Binscarth, MB
Marilyn Crewe, Neepawa Area Development Corporation – NADCO (Neepawa, Glenella-Lansdowne, North Cypress Langford & Rosedale)	Tanis Chalmers, Dennis County Development Partnership – DCDP (Virden, Pipestone & Wallace-Woodworth)
Craig Senchuk, Brandon, MB	

WOLG Associate Members

Elton	Riverdale	Glenboro	Rosser
Oakview	Cartier	Yellowhead	

02 INTRODUCTION

The expansion of soybean production acres in Central Manitoba, Western Manitoba and SE Saskatchewan, combined with potential growth of regional hog production, positions Manitoba as an advantageous location for a soybean processing plant.

Investment by a globally competitive processor is expected in the next 2–4 years, with Manitoba communities, SE Saskatchewan communities and North Dakota as potential locations. Targeted investment in the soybean value chain includes a soybean processing plant, value added soy–oil uses and potentially bio–diesel. A local soy meal plant would support further growth of the livestock sector.

Key Points

- Soybean acreage is growing—3.15M acres were planted in 2017.

	2016	2017	%
Manitoba	1,640,000	2,300,000	+40%
Saskatchewan	240,000	850,000	+254%
Total	1,880,000	3,150,000	+67%

- Continued investment in soybean varieties points to future expansion across Manitoba & Saskatchewan.
- A recent feasibility study indicated a critical mass soy bean plant would require about 2 million tonnes of production in its catchment area. This critical mass has been reached.
- North American companies are aware of the opportunity.
- Companies with limited North American processing capacity are examining the opportunity.
- The WOLG has been established to attract a world-scale soybean processing facility.
- Their interest is industry attraction and not plant ownership.

Considerations

- The centre of soybean production is migrating west, with significant growth now happening in Saskatchewan.
- Competition from US processing plants limits location viability in SE Manitoba, as US plants will likely price compete for regional soybean supplies. Greater distance reduces this competitive pressure.
- Soybean meal competes well in the livestock value chain; local soy meal production would increase sector viability by eliminating transport costs to and from the US for processing.
- Producing soybean meal for livestock feed positions these industries for growth, particularly the hog sector. Cost effective delivery to market improves the overall profitability of the hog sector. Manitoba Pork advises that a 7%–9% reduction in feed input costs could DOUBLE per hog profitability.

Growth Challenges Exist

Soybeans are a relatively new crop. With that comes challenges.

- This is the periphery of the soybean growing region. Continued growth will be influenced by local weather conditions, area/price competition from more established crops, grower experience and varietal improvement, to name a few.
- International trade factors will influence global commodity prices, and with it local profitability and planting interest.
- Production volumes and protein content remain highly variable. Local grower experience and market acceptance continue to evolve.
- Large scale adoption of this nitrogen fixing crop delivers environmental benefits, while the impact of large scale regional mono-cropping is yet to be fully understood.

02 INTRODUCTION

National Strategic Interest

Today there are no soybean processing facilities of scale in western Canada. As the crop base grows it will be in Canada's interest to establish a globally competitive large-scale soybean processing facility:

- Domestic processing capacity will protect the Canadian industry from potential Canada/USA trade disruptions.
- Delivers value added processing in Canada rather than exporting a commodity product.
- Insulates Canadian producers from fluctuation in the Canadian dollar.
- Establishes a Canadian source of soybean meal to support and grow the Canadian food industry.
- Delivers long-term confidence in soybean production, thereby prompting further producer investment in a crop with higher comparative value than many in production today.

Manitoba Strategic Interest

Manitoba, and specifically western Manitoba, is well positioned to attract this investment:

- For soybean producers a local processing plant would provide direct value added market access, bypass uneven rail service to US markets, and remove the vagaries of exchange rate fluctuations.
- A local facility is expected to generate freight savings and prompt better soybean prices to growers.
- Livestock producers would benefit by gaining a local protein feed supply at locally competitive prices.

- Soy's use as a hog feed positions for growth in the industry with central distribution. Production could grow substantially, with most occurring west of the Red River.
- Industry sources anticipate a reduction in hog feed input costs of 7%-9%. Sources believe this would translate into a DOUBLING of profit on a per hog basis.

Today, the natural home for a new soybean processing facility seems to be Manitoba. While so, competing interests in Saskatchewan and North Dakota does not make a 'Manitoba location' a natural decision.

- North Dakota is expanding its soybean production acreage. The US agricultural industrial complex contains many price supports and development programs that do not exist in Canada. The ability to export soybeans to the USA is straightforward. A new facility is being considered for Spiritwood, North Dakota—distance limits potential impact, but other facilities closer to the border could draw production.
- Saskatchewan, while on the periphery of the current production zone, has Canada's largest agricultural land base and recent success at attracting canola processing facilities. Recent acreage growth has been substantial. Significant corporate investment in genetic development is expected to expand acreage into Saskatchewan. Locations such as Weyburn and Moosomin, Saskatchewan will look more attractive for investment as cropping areas increase in that province.



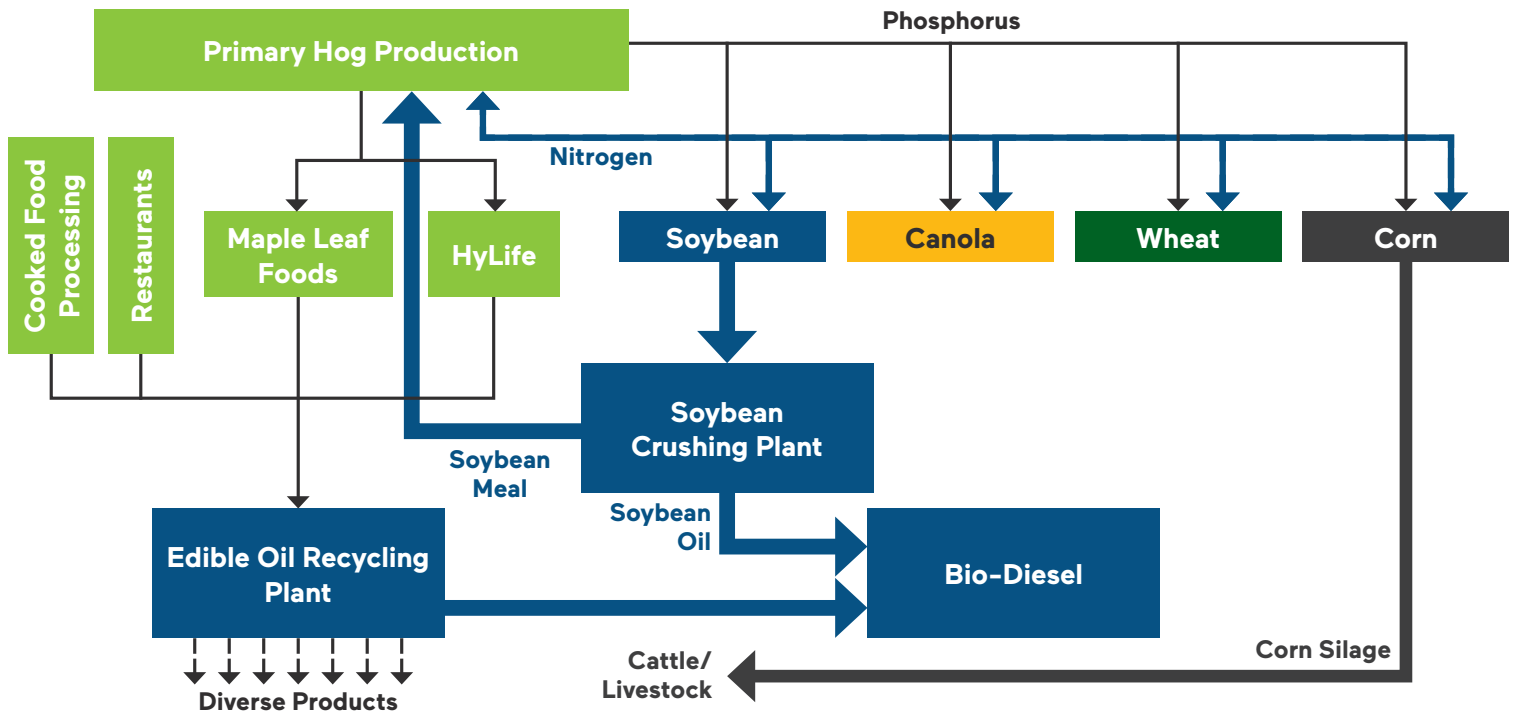
03 A LITTLE BACKGROUND

Soybean processing plants convert soybeans into meal/hulls (~79-80%)¹, soybean oil (~19-20%) and soap/ lecithin/dockage (~1-2%)². Soybean meal is the world’s most popular protein source for hog/ animal feed; soybean oil is converted to a variety of uses, including food-grade oils, industrial products and bio-diesel. Soybean processors generally are located close to supply to minimize transport costs, and preferably close to a market for the soybean meal. Soybean oil refineries (bio-diesel) generally co-locate with a processing facility.

The expansion of soybean production acres in Central/Western Manitoba and SE Saskatchewan, combined with an anticipated expansion of hog production, positions SW Manitoba as an advantageous location for a soybean processing plant. As the

crop base grows it will be in Manitoba’s interest to support establishment of a globally competitive large-scale soybean processing facility to further grow the soybean sector and to provide a local, cost competitive source of feed to support hog sector growth. Investment by one of the large processors is expected in the next 3-4 years.

The accompanying chart describes the value chain and the potential synergies between the existing pork production sector and the output of a soybean processing plant. Producing hogs and soybeans have a synergy with other field crops in that both can be tapped to supply nitrogen for other crops in the rotation (e.g. canola, wheat, corn). Primary hog production also produces nutrients that can become key elements to maximize the yields of soybeans and other crops.



¹ Depending on the plant, soybean hulls (basically fibre) may be sold as a distinct product or they may be mixed back into the soybean meal. Soybean meal typically is specified as 48% protein (no hulls) or 44% protein (with hulls).

² https://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwiilu-nzMDTAHVGOYMKHRD6BJ0QFggiMAA&url=http%3A%2F%2Fwww.nescaum.org%2Fdocuments%2Fstakeholder-comments-on-the-low-carbon-fuels-standard%2Fcomments-from-national-biodiesel-board%2Fsoybean-processing-documentation1-26-09-nopa-board-revision-030409.pdf%2F&usq=AFQjCNFFQZeDvPpBdmX2Mz1rUm_t-17-w

04 A POTENTIAL FACILITY—PROFILE

The private sector ultimately will determine the specifications and scale of investment for the soybean processing facility. This includes processing type, size, product line, location and other key decisions (such as linkage to bio-fuel production). However, preliminary work has been undertaken to scope the opportunity and determine potential benefits to the Region, the Province and the Nation.

Two different plant configurations could be developed. First is a mechanical crush facility. Second is a hexane-based processing facility, which usually is developed on a larger scale and designed for higher throughput. The accompanying specifications are provided for a 'model' hexane based facility designed to process 2500 tonnes of soybeans per day. Future work will validate these data—actual plant design will be a corporate decision.

A hexane-based facility is projected to cost ~\$330M (range of \$150M–\$350M) to construct. This does not include an oil processing facility (bio-fuel) that could be built in tandem with the soybean facility. This cost estimate includes core capital costs for the facility, shared capital investments for electric connection, rail access and infrastructure like water/wastewater provision. A contingency of 30% has been applied to complete the projection.³

A separate bio-fuel or other oil processing facility could add between ~\$10M–\$50M to the overall investment.

Preliminary Facility Cost Estimate

Item	Plant Estimate
Core Costs – Processing Plant, Storage, Site Preparation	\$125M–230M (Est: \$180M)
Oil Refining / Bio-Diesel	TBD
Shared Capital Investment* – Electrical connection, Water / Wastewater, NG Supply, Rail Access, Waste Management	\$30M–120M (Est: \$75M)
Contingency (30%)	\$50M–100M (Est: \$75M)
Total (Not including bio-diesel facility)	\$200M–450M (Est: \$330M)

Source: Prairie Practitioners Group, US General Accounting Office (GAC) cost exercise, Class 5 provides order of magnitude screening for projects, Definition to come in feasibility study

Preliminary Facility Operations

Base Parameters		Inputs (Crushing & Refining)	
Input Capacity	2,500 t/day	– Soybeans	2,500 t/day
	~875–900,000 t/year	– Total Water	885,000 kg/day
Output/Products		– Total Electricity	92,000 kWh/day
– Meal	1,962 t/day (79%)	– Total Steam	735,000 kg/day
– Oil	481 t/day (19%)	– Total NG	~1800 mmBTU
– Soap/Lecithin	21 t/day (~2%)	– Hexane	1.4 t/day
		Refining:	
Land, Jobs, Impact:		– Bleaching Agent	2,596 kg/day
Land Area	40–200+ acres	– Phosphoric Acid	481 kg/day
Jobs (direct)	40–80 (60 est.)	– Sulphuric Acid	962 kg/day
Jobs (indirect)	~646	– Activated C	96 kg/day
Build Time	3–4 years	– Sodium Hydroxide	1,346 kg/day

Source: Prairie Practitioners Group, SJ Research Services, Soybean Crush Operating Parameters, EU Environmental Study

³ Data sources for infrastructure give highly variable metrics; a range is provided. NOPA data sources generally report higher demand than EU sources, perhaps due to more stringent environmental standards in the EU. These discrepancies confirm the need for development of a "Manitoba-focused" model facility—this is identified in the WOLG work plan as a key action. These preliminary specifications do not attempt to define peak load requirements.

05 BUILDING A FULLY INTEGRATED INVESTMENT ATTRACTION STRATEGY

Since the fall of 2016 work has been extensive, with significant attention focused on a November 2017 workshop where the plant was discussed in detail. Much work has taken place since then. In January 2018 the WOLG mandated a Design Team to build a very open and widely supported Investment Attraction “Strategy Roadmap”. The WOLG then engaged Integral Strategy Network to facilitate development of the Strategic Roadmap.

Work was completed in March, 2018, and the Strategic Roadmap presented at an Open House to share results and attract additional support from the larger community. Input from the Open House helped finalize the Strategic Roadmap as presented here. Members of the Design Team include:

WOLG Strategic Roadmap Design Team	
City of Brandon	Town of Carberry
NADCO - Neepawa Area Development Corp. (Town of Neepawa, RM of North Cypress-Langford, RM of Glenella-Lansdowne, RM of Rosedale)	Dennis County Development Partnership (Town of Virden, RM of Pipestone, RM of Wallace-Woodworth)
Municipality of Russell-Binscarth	Westman Opportunities Leadership Group Board
Assiniboine Community College	Association of Manitoba Municipalities
Brandon University	Entrepreneurship Manitoba
Manitoba Agriculture (Industrial Development Specialist, Pulses Specialist, Swine Specialist)	Manitoba Growth, Enterprise & Trade
Manitoba Hydro	Brandon University Rural Development Institute

The Strategy Roadmap presents a fully defined strategy to attract the soybean investment on a single page. It clarifies strategic intentions, identifies the outcomes necessary and the actions required to achieve them. It also shows stakeholders (including those participating at the Open House) where they can contribute and make a difference. These then are grouped into capability areas to focus and align the work to come. Square boxes identify actions; circles describe outcomes needed to achieve the ultimate strategic goal of “A major soybean processing facility has been attracted to Manitoba.”

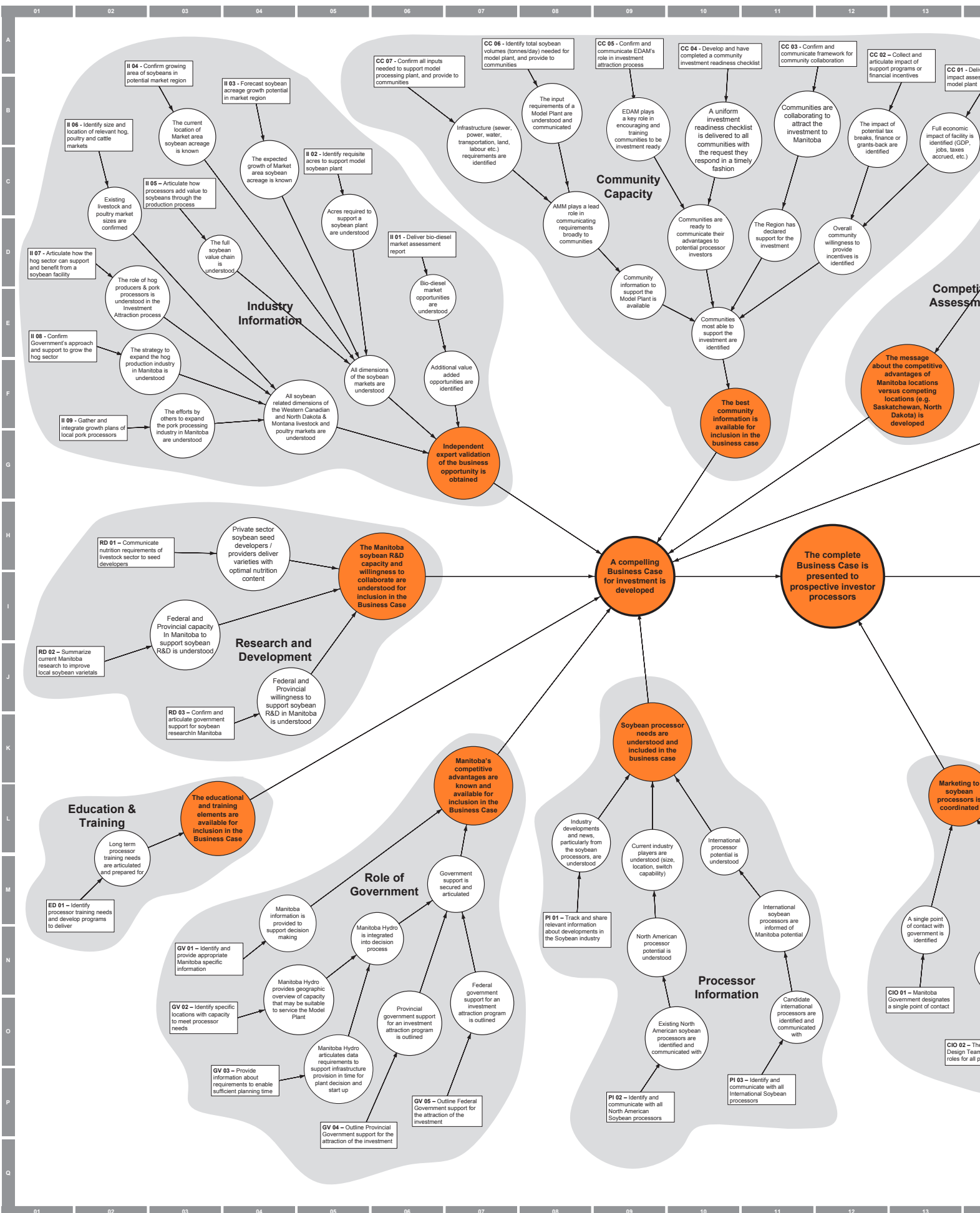
The WOLG now has a clear mechanism to set priorities, assign accountability, monitor progress and identify and then allocate the resources needed to achieve success. The Strategy Roadmap also identifies broader social impacts and benefits that will come to Manitoba when a plant is established, with the end result being “Manitoba’s competitive position is enhanced”.

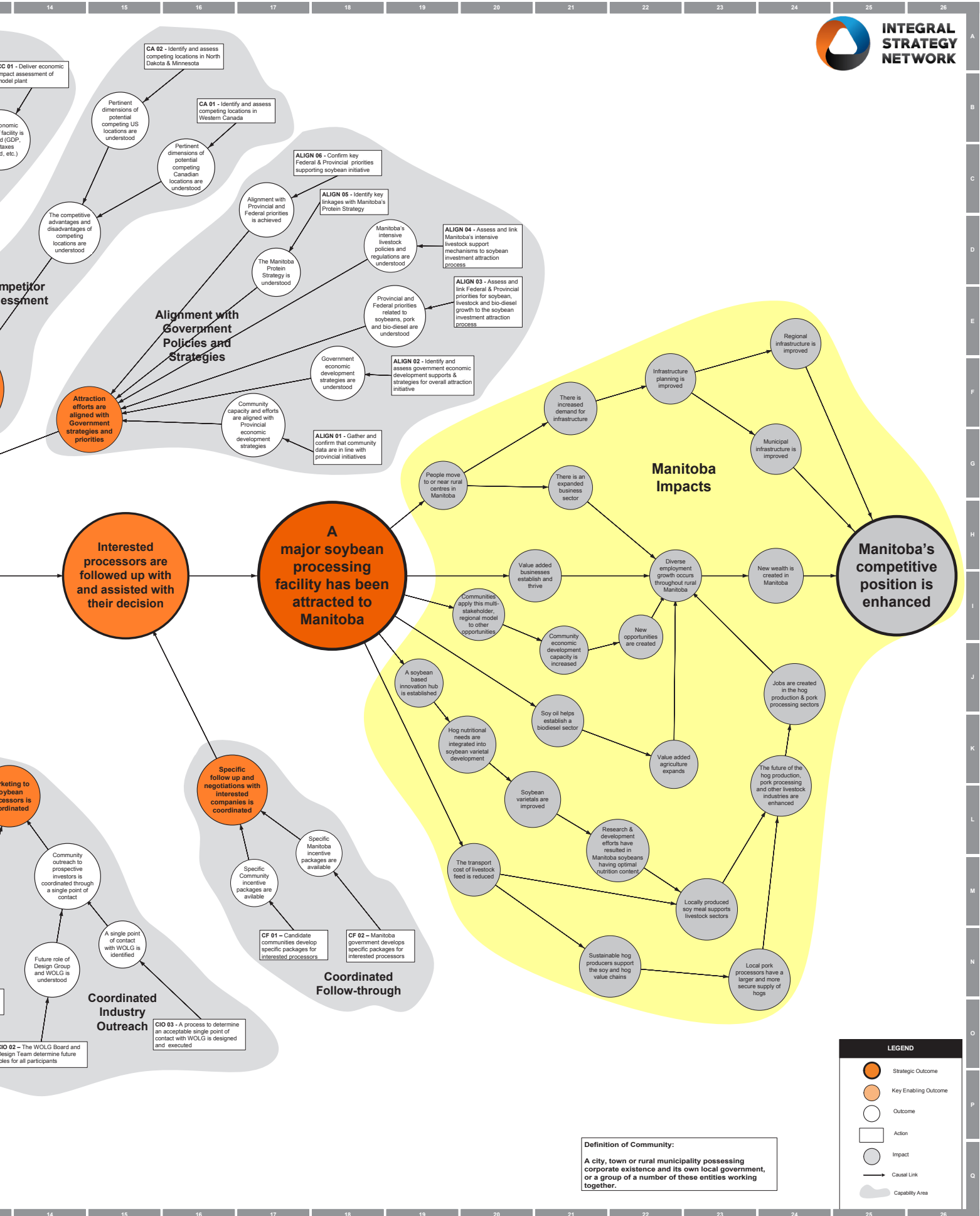
Using this Strategy Roadmap, work now begins on an integrated multi-phase, multi-year attraction program to secure the investment in a world-scale plant. Appropriate industry expertise will be engaged to fully define the opportunity, coordinate activities and engage the soybean industry around the world. This will include analyzing:

- the western Canada soybean sector;
- the market for soybean-based products, including livestock markets;
- plant design details and infrastructure requirements;
- potential competing jurisdictions; and
- profiling the Manitoba communities capable of hosting the plant facility.

The Westman Region aims to be ready to attract this major investment to the Province. In addition, the collaborative capacity that has been created now will strongly position the Region to pursue future economic opportunities. This approach developed to attract a soybean processor can be applied to other emerging opportunities, like bio-fuels and oil processing.

Strategy Roadmap – Soybean Processing Facility





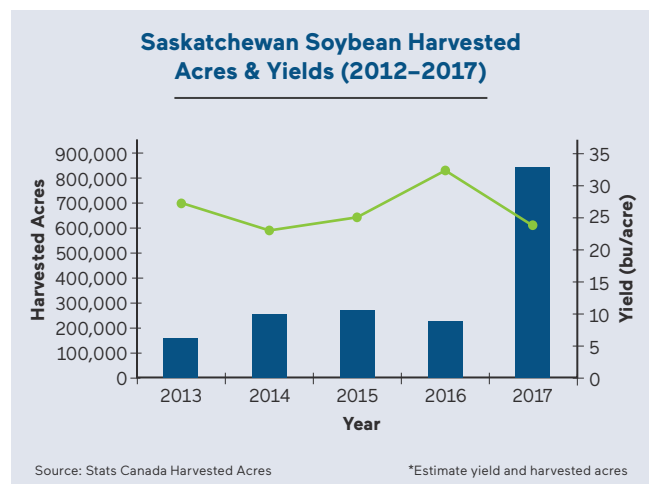
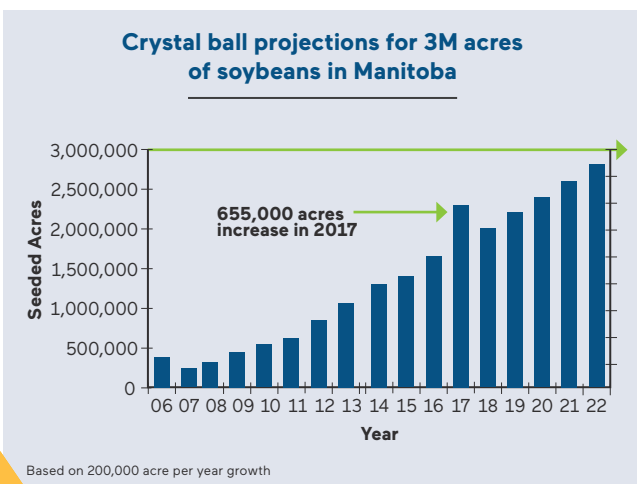
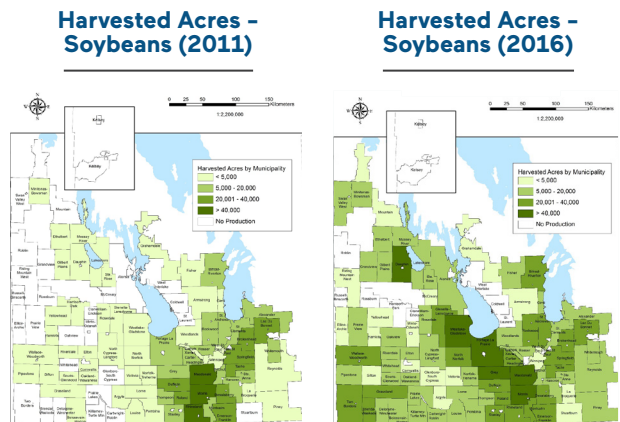
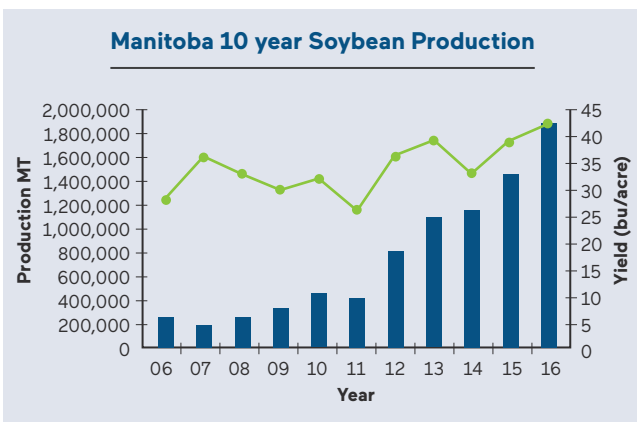
06 SOYBEAN ACREAGE GROWTH

Soybean production is predicted to continue to increase at a good pace over the next decade. World production is expected to grow by 33%+ in that period. Genetic development programs are underway in western Canada; companies have set aggressive crop establishment targets for the next decade, which is expected to advance establishment out of traditional areas into the black and brown soil zones of western Manitoba and eastern Saskatchewan. By 2024 Western Canada is expected to produce 28% of Canada's soybeans.

Recent growth supports such projections. The attached graphs, provided by Manitoba Agriculture, outlines

projected soybean acreage. Actual growth has exceeded Departmental expectations. In 2017 Manitoba's acreage swelled to 2.2 million, a 34.6% increase from 2016 levels. In the same period Saskatchewan's soybean acreage more than tripled from 240,000 to 730,000 acres. In combination, 2017 saw approximately 3.0 million acres planted in Manitoba/Saskatchewan⁴. The 3.0 million acre base well exceeds the 2.0 million acre threshold that has been identified as necessary to support a world scale processing facility—this does not include US acreage within the market reach of a facility.

It is expected that the number of acres planted will vary each year. 2018 crop areas may well be lower than 2017. But, long term acreage growth is expected in Manitoba and Saskatchewan.



⁴ <http://www.producer.com/2017/04/canola-soybean-acres-surge-in-statscan-seeding-estimate/>

06 SOYBEAN ACREAGE GROWTH

Soy Canada confirms that soybeans are the fastest growing crop in western Canada, with acreage increasing 506% since 2010. Today soybeans represent roughly 5% of the principal field crops.

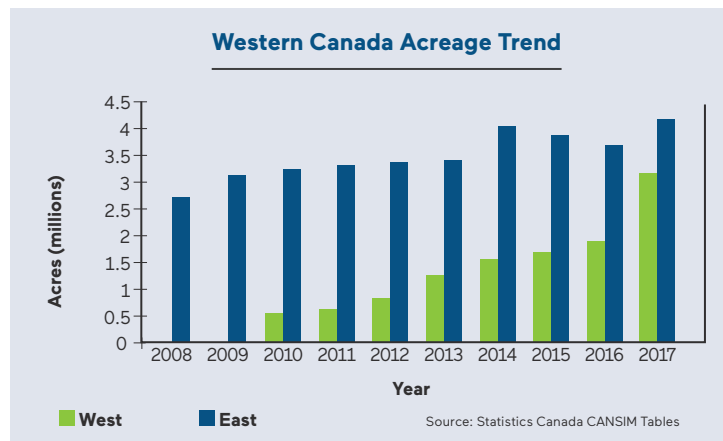
Soybeans are forecast to be the 3rd largest export crop from Canada, expected to be 6.0 million tonnes in 2017.

Key factors influencing national and global production include:

- The world supply of soybeans is estimated to rise to 34.4 billion bushels.
- Top export markets include China, USA, Japan, Europe, Asia.
- A modest increase in Chinese soybean imports is expected given domestic agricultural reforms
- Chinese efforts to encourage the use of mixed feeds with a soy component may positively impact demand.
- Prices are expected to soften if the CDN dollar rises and there is a continued increase in crude oil prices.

Nationally, works is underway to:

- Increase soybean protein levels, as higher % commands a price premium.
- Increase yield, maturity and protein characteristics overall.
- Improve time to maturity and other factors to support continued migration of the crop to the north and west.



Soy Canada Goals & Targets

Double production in the next decade

	2016	2027
Total Seeded Area (Acres)	5,467,100	10,000,000
Eastern Canada	3,592,100	4,000,000
Western Canada	1,875,000	6,000,000
Yield (Bushels/Acre)	44.1	48.2
Eastern Canada	46.1	53
Western Canada	40.1	45
Total Production (Tonnes)	6,462,700	13,000,000
Eastern Canada	4,491,200	5,750,000
Western Canada	1,971,500	7,250,000

Increase world-leading high-quality of food-grade production by 25%

	2016	2027
Food-grade production (tonnes)	1,250,000	1,800,000
Seeded Acres	1,000,000	1,250,000

Based on Canadian soybeans' contribution to natural capital

- Canada's soybean sector will work to improve the natural environment that supports our industry
- Be recognized in Canada and around the world as a global leader in sustainable production of high-quality soybeans

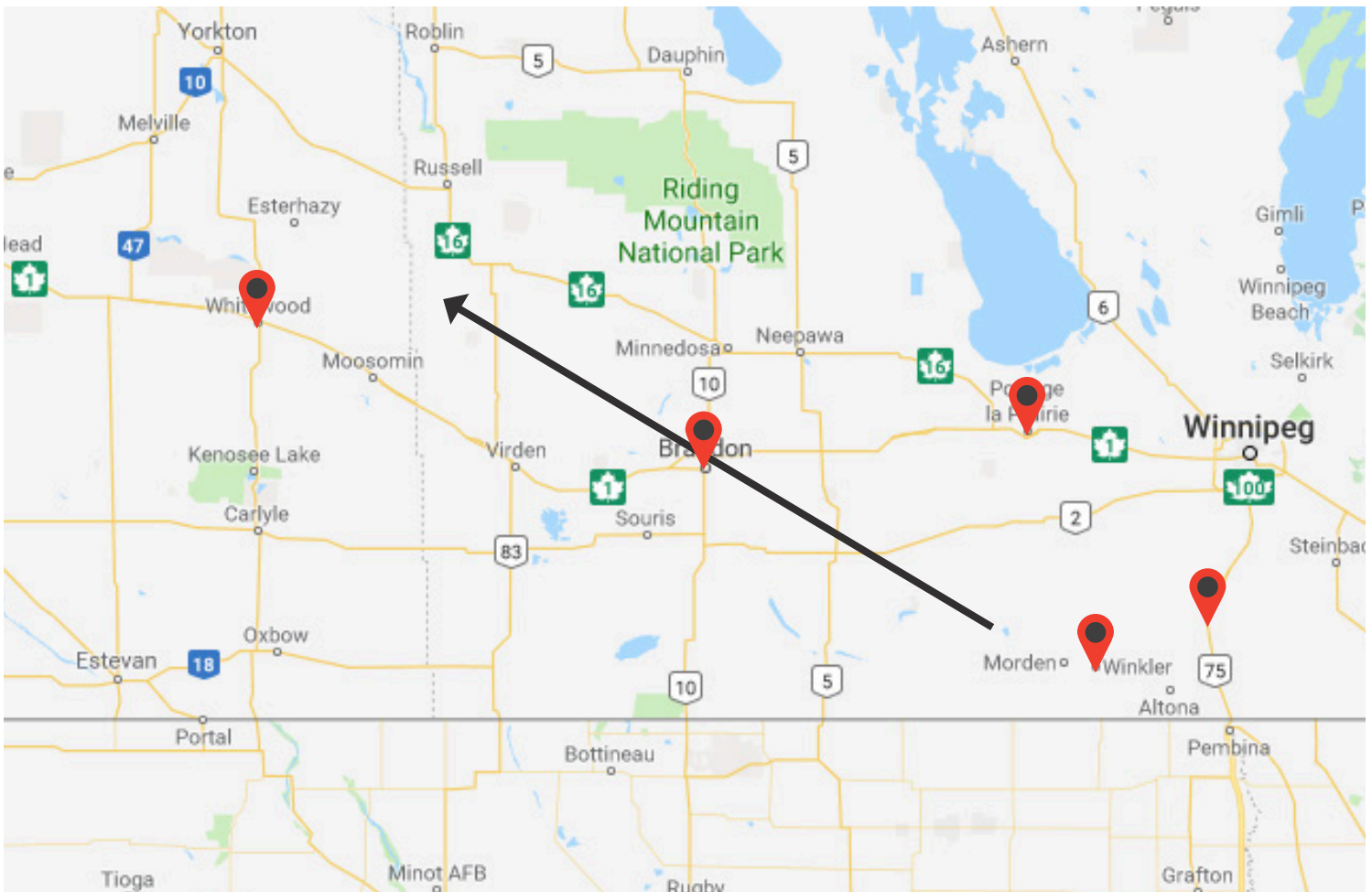
Increase competitiveness, exports and processing of commodity soybeans

	2016	2027
Protein Content Dry matter back (13% moisture)		
– Eastern Canada	40.6 (35.3)	41.1 (36)
– Western Canada	38.7 (33.7)	40.2 (35)
Whole Soybean Exports (tonnes)	4,500,000	10,500,000
Processing Capacity (tonnes)	1,878,000	2,500,000

07 THE CENTRE OF SOYBEAN PRODUCTION IS MOVING NW

The midpoint of soybean production is migrating north and west. The migration is positioning communities in western Manitoba very well for future investment.

Mid-point Soy 2020 Production Manitoba & Saskatchewan



08 LIVESTOCK SECTOR IMPACT

The hog industry in Manitoba is logically a major consumer of locally produced soybean meal. Soymeal has the highest protein content and digestibility amongst all plant based protein sources, and delivers an optimal mix of amino acids. When combined with other locally produced feed grains it provides most of the essential nutrients that hogs require.

Recent work by Mercantile Consulting Ventures Inc. confirmed that a Manitoba-based soybean processing facility would have a total cost advantage of \$47.58/tonne over American competition⁵, a portion of which would be transferred through the supply chain to the hog sector. Discussions with Manitoba Pork confirmed that a reduction in input costs of 7%-9% would double the profit margin on a per hog basis. (The June 2017 price for soymeal is \$440/tonne CDN).

Manitoba has western Canada's highest concentration of hogs. Further growth is anticipated. A combination of existing barns needing re-development and expanded production points to further growth. In October 2016 HyLife Foods announced a \$125M expansion for their Neepawa processing complex to better compete into the Asian (Japanese) market. This will deliver two-shift processing capacity for 1.9 million hogs per year, new hog barns and a feed mill. Barns are expected to be located in SW Manitoba given the construction moratorium in SE Manitoba, and in Saskatchewan. (In November 2016 SaskPork set a growth target of 100,000 more finishing spaces, which equates to an additional 250,000-300,000 hogs/year production increase, largely in eastern Saskatchewan.)

Maple Leaf Foods, the Province's largest hog processor, is located in Brandon. In 2015 the Company confirmed that a significant number of new barns are needed to operate at full capacity. The Brandon facility can process up to 90,000 hogs/week, but is operating at about 70,000/week.

Preliminary estimates are that the combined impact of reaching production capacity at the Maple Leaf plant and the Hylife expansion could require upwards of 1.5M additional hogs/year. Applying an average barn size of 4,000 head, this would prompt additional investment in approximately 125 barns. At an

average cost of ~\$2M this would generate industry investment of approximately \$250M, and produce approximately 420 Full Time Equivalent (FTEs) positions. Local nutrient production also would increase, with an estimated 6,500 and 3,000 tonnes of Nitrogen and Phosphorous produced, respectively.

Moreover, it is expected that an improved sector outlook would prompt re-investment in existing barns and ancillary production infrastructure. There is approximately \$2B invested into existing hog barn infrastructure in Manitoba. Barn life is estimated at approximately 20 years, with many facilities now reaching the end of their economic life. A rebuild is necessary to modernize and to support future growth. An estimate of investment for the next 3 years, along with addressing pent up lack of investment, would require upwards of \$600M for the period.

In total, growing confidence in the hog sector, arising from a number of sources including increased profitability linked to local soymeal production, could generate investment of upwards of \$850M over 3 years and result in approximately 420 FTEs created specific to the hog sector and additive to benefits tied to the soybean facility.

Other Animal Feed Opportunities

In addition to hogs, the livestock complex in Western Canada could benefit from a local supply of soybean meal. Soybean meal is equally popular in poultry production as hog production. It provides similar dietary advantages and provides most of the essential nutrients with only minimal addition of supplements.

⁵ Mercantile Consulting Venture (2015) Manitoba Crush Feasibility Study, conducted for Soy20/20, Guelph Ontario, by Mercantile Consulting Ventures Inc., Winnipeg, March 2015, p. 4.

09 SOYBEAN PROCESSING PLANT—ECONOMIC IMPACT

SJ Research Services Inc. was contracted to perform a detailed input-output analysis of the economic impacts of a new soybean processing plant in Manitoba. The expansion of soybean production acres in Central Manitoba, Western Manitoba and SE Saskatchewan, combined with a hypothetical expansion of hog production in the Central and Westman regions, positions Manitoba as an advantageous location for a soybean processing plant.

An economic model was developed to estimate economic impacts to the province of Manitoba, Brandon and region, and the rest of the province of Manitoba. Results below are the sum of annual direct, indirect, and induced impacts. Direct impact is the total initial expenditure, usually construction or operating outlays. Indirect impact is the secondary impact that includes inter-industry transactions; purchases of inputs from supporting industries. Induced impact is the additional impact from changes in household spending as industries modify labour input requirements in response to altered levels of demand for output.

Gross Output measures total economic activity in the production of new goods and services in an accounting period and includes total expenditures on local goods and services as well as payments to labour and business profits. Gross

output includes double counting because it includes the value of inputs used in production rather than net value added alone.

Gross Domestic Product (GDP) measures net economic activity within a prescribed geographic area. It represents the payments made to final factors of production: labour,

unincorporated business profits, and other operating surplus (corporate profits, interest income, inventory valuation adjustments, and capital consumption allowances). Gross domestic product excludes the value of intermediate goods and services used in production. Labour income includes wages, salaries, and employer contributions to pensions and benefit packages.

Construction Impacts

Construction Impacts are cumulative over the course of the construction phase. Operations impacts are for a single year of production.

Summary of Impacts—Soybean Project in Manitoba

Provincial Impacts— Soybean Project	Gross Output (\$M)	Gross Domestic Product (\$M)	Employment (Positions)	Labour Income (\$M)
Plant Construction ONE TIME	542.7	259.4	2934.6	143.0
Plant Operations PER YEAR	564	71	834	37
Expanded Hog Production PER YEAR	277.7	113.9	850	26.3

Summary of Impacts—Soybean Project in Southwest Manitoba

Regional Impacts— Soybean Project	Gross Output (\$M)	Gross Domestic Product (\$M)	Employment (Positions)	Labour Income (\$M)
Plant Construction ONE TIME	265.3	112.6	1249.4	69.8
Plant Operations PER YEAR	475	17	195	10
Expanded Hog Production PER YEAR	217.3	79.3	482.7	10.7



09 SOYBEAN PROCESSING PLANT—ECONOMIC IMPACT

Operation Impacts

Plant output was estimated at \$455M per annum based on 1964 tonnes per day of meal at the current spot price, 500 tonnes per day of soy oil also at the current spot price. Bean inputs were estimated at 2500 tonnes per day at the current spot price. Utility purchases consists of natural gas, electricity and water at estimated volume and current prices. Direct employment is estimated at 80 positions based on a similarly sized plant in Quebec. Labour income was estimated at positions times the average provincial manufacturing industry annual earnings.

The remainder of inputs were estimated using the input structure from the detailed Manitoba input output tables for the industry “Animal food manufacturing”. Meal that is not used as hog feed is assumed to be exported along with soy oil. Because soybean inputs are a redirection of existing exports, no additional agricultural output is assumed. Finally, inputs were adjusted for import leakages using the default model local supply ratios.

Significant economic impacts of operating a large-scale soybean processing plant were calculated by the model, including impacts on the Brandon area itself as well as on the province of Manitoba.

The annual provincial impacts of operating a soybean processing plant are detailed in the accompanying chart:

Plant Operations Impact—Province

Gross Output (\$M)	
Direct	455.0
Indirect	77.6
Induced	31.3
Total Gross Output (\$M)	564.0
Gross Domestic Product (\$M)	
Direct	6.1
Indirect	45.5
Induced	19.3
Total Gross Domestic Product	70.9
Employment (Positions)	
Direct	80
Indirect	529
Induced	225
Total Employment	834
Labour Income (\$M)	
Direct	4.6
Indirect	24
Induced	8.3
Total Labour Income	36.8

09 SOYBEAN PROCESSING PLANT—ECONOMIC IMPACT

Operation Impacts

The Brandon and region annual impacts of operating a soybean processing plant are detailed in the accompanying chart:

Plant Operations Impact—Region

Gross Output (\$M)	
Direct	455.0
Indirect	18.7
Induced	0.8
Total Gross Output (\$M)	474.6
Gross Domestic Product (\$M)	
Direct	6.1
Indirect	10.3
Induced	0.5
Total Gross Domestic Product	16.9
Employment (Positions)	
Direct	80
Indirect	110
Induced	5
Total Employment	195
Labour Income (\$M)	
Direct	4.6
Indirect	6
Induced	0.3
Total Labour Income	10.4

10 APPENDIX—REFERENCES & ACKNOWLEDGEMENTS

1

Depending on the plant, soybean hulls (basically fibre) may be sold as a distinct product or they may be mixed back into the soybean meal. Soybean meal typically is specified as 48% protein (no hulls) or 44% protein (with hulls).

2

https://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwiilu-nzMDTAhVG0YMKHRD6BJ0QFggiMAA&url=http%3A%2F%2Fwww.nescaum.org%2Fdocuments%2Fstakeholder-comments-on-the-low-carbon-fuels-standard%2Fcomments-from-national-biodiesel-board%2Fsoybean-processing-documentation1-26-09-nopa-board-revision-030409.pdf%2F&usg=AFQjCNFFQZeDvPpBDmX2MZ1rUm__t-l7-w

3

Data sources for infrastructure give highly variable metrics; a range is provided. NOPA data sources generally report higher demand than EU sources, perhaps due to more stringent environmental standards in the EU. These discrepancies confirm the need for development of a “Manitoba-specific” model facility—this is identified in the WOLG work plan as a key action. These preliminary specifications do not attempt to define peak load requirements.

4

<http://www.producer.com/2017/04/canola-soybean-acres-surge-in-statscan-seeding-estimate/>

5

Mercantile Consulting Venture (2015) Manitoba Crush Feasibility Study, conducted for Soy20/20, Guelph Ontario, by Mercantile Consulting Ventures Inc., Winnipeg, March 2015, p. 4.

Funding for the soybean investment attraction initiative has been provided through community and sector groups interested in seeing a facility establish in Manitoba. In addition, Manitoba Municipal Relations provided significant funding to develop the strategy roadmap, which is centred in this document.

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