Volume 6: Southwestern Ontario

A Study of the Optimization of the Blue Box Material Processing System in Ontario

Final Report

June 2012

Prepared for Waste Diversion Ontario by:

Resource Recycling Systems
Sustainable Systems for a Waste-Free Future

STEWARDEDGE

Volume 6: Southwestern Ontario

Table of Contents

List of Tables

List of Figures

Volume 6: Southwestern Ontario

1. Introduction

The purpose of this study is to provide Waste Diversion Ontario (WDO), including the Continuous Improvement Fund (CIF), individual municipal owners, the Association of Municipalities of Ontario (AMO) and Stewardship Ontario (SO) with comprehensive independent information on a theoretical optimized MRF and transfer facility network for the province of Ontario.

The Project Team has developed a geographic information system (GIS) model that will:

- Theoretically reflect a cost-effective, efficient and successful recovery system for packaging & printed paper in Ontario, and
- Inform decision-making toward an optimized provincial system for the transfer, hauling and sorting of Blue Box recyclables for market

Volumes 4 through 7 present a range of options for each of four regions of the Province that would represent optimized systems depending on the criteria used for decision-making.

Also presented is a high level transition planning process that can be used in each region, which addresses the situations for each of the facilities and each municipality with respect to its existing infrastructure and the proposed optimized system options. These provide guidance regarding the steps and decisions that must be made.

The combination of the key options for the entire province, i.e. all regions is summarized for after the options for the region.

2. Development of Options

2.1. General Assumptions

1. The Province has been divided into four regions:
    I. Eastern Ontario (Volume 4)
    II. Central Ontario & GTA (Volume 5)
    III. Southwest Ontario (Volume 6), and
    IV. Northern Ontario (Volume 7)

2. Modelling excludes collection

    - It is acknowledged that there are likely impacts on the haul times from the end-of-route or depot locations.
    - Since this project does not model collection systems, the impacts cannot be quantified.
    - However, we have assessed a relative measure of the change in direct haul time between the options and variations.

- It should be noted that assumed changes to the existing collection system could yield efficiencies, i.e. a move to automated, single-stream collection, but assessment of these is beyond the scope of this project and they have not been assessed.

3. Existing private sector facilities have been identified for possible inclusion in the optimized system, but since no cost and capacity data were available for private sector operations, a greenfield cost estimate has been used where necessary.
4. Similarly, some facilities outside Ontario have been identified and included in various options and a greenfield cost estimate has been used.

2.2. Steps to Develop Options

The following steps are taken to develop options for an optimized processing and transfer system. Options are developed for each region independently, although some options may involve material flowing across into different regions.

1. Establish a baseline based on the greenfield scenario in the year 2025 under natural growth recovery conditions with lowest number of MRFs.
2. Establish options:
   - Increase the number of MRFs
   - Define the cost implications for natural and high growth scenarios
   - Identify potential benefits, e.g.
     - redundancy - the feasibility to offer sufficient capacity for processing operations within this or neighbouring regions in the event of emergency that doesn't potentially exist at other facilities in this or neighbouring regions
   - If the benefits are not considered significant, do not proceed to next option
3. Assess variations on options:
   - Eliminate small aggregation points (e.g. < ~2,000 tonnes per annum) and where material currently is hauled further than to the nearest alternative
   - Consider using existing facilities:
     A. Utilize existing public facilities as transfer station or MRFs without increasing the number of aggregation points.
     B. Add all public facilities that can feasibly handle the tonnes directed to it (based on best available data).
     C. Utilize all existing public and private facilities to minimize any effect on the existing collection infrastructure.
   - Develop cost estimates to upgrade and use public facilities and use greenfield operating costs for all facilities
     A. Refer to Volume 3 for details of estimating conversion costs
   - Consider using existing MRFs to minimize impacts on haul distances and construction costs, if they can be upgraded
   - Consider transfer of material from large population centres across provincial and US-Canada border when the distance is small

2.3. Presenting Results

- No single system has been recommended for a given region since there were no discussions with municipal officials and to acknowledge the need to consider local factors and criteria and analyse collection impacts

The results for each region are presented with:

- Maps showing the Baseline Greenfield System and options showing:
  - Existing infrastructure, identifying the flow of material to aggregation points and transfer to MRFs
  - The quantity of material handled at each location
  - The total gross cost per tonne for transfer, hauling and processing at each aggregation point
- Tables summarizing:
  - The number of facilities
  - The number of conversions: MRFs to transfer stations and upgrades of MRFs and transfer stations
  - The total annual capital and operating cost of the option
  - The total investment required in new facilities and conversion
  - The implication on neighbouring regions – when material moved from one region to a different region than in the Baseline Greenfield option so that the cost was not counted twice in the province-wide summary
  - The change in direct haul time for each option compared to the Greenfield Baseline
- A commentary briefly describing the key elements of the option, i.e. the number and location of MRFs

2.3.1. General Map Description

Each map of the Baselines and Options shows key information to inform decisions and metrics spatially. Each map shows three main items:

- Current System:
  - Current Blue Box program boundaries are shown in grey.
  - Blue and green triangles, squares and circles represent existing transfer and processing facilities. Some current facilities are used in variations on the Baseline and Options showing impact of using these facilities in the future system.
  - Direct Haul Collection:
    - Each of the small points represents generation of Blue Box material based on population. (See Volume 2 for more detail).
    - Each of the dissemination area points is coloured based on the maximum end-of-route haul time assumed for the location given its demographic situation
    - Purple lines represent direct hauling from the end of collection routes.
- Greenfield System:
  - Proposed transfer station locations are shown with orange triangles
  - The thicker red lines, in turn, represent the Blue Box tonnes transferred from each transfer station to applicable MRF Locations

2.3.2. Description of Summary Tables

The summary tables for each region present the cost of the options, covering the annual capital and operating cost as well as an estimate of the cost of the capital in the system. They also provide an indication of the relative effect of the option on the collection system resulting from changes to the number and location of aggregation points.

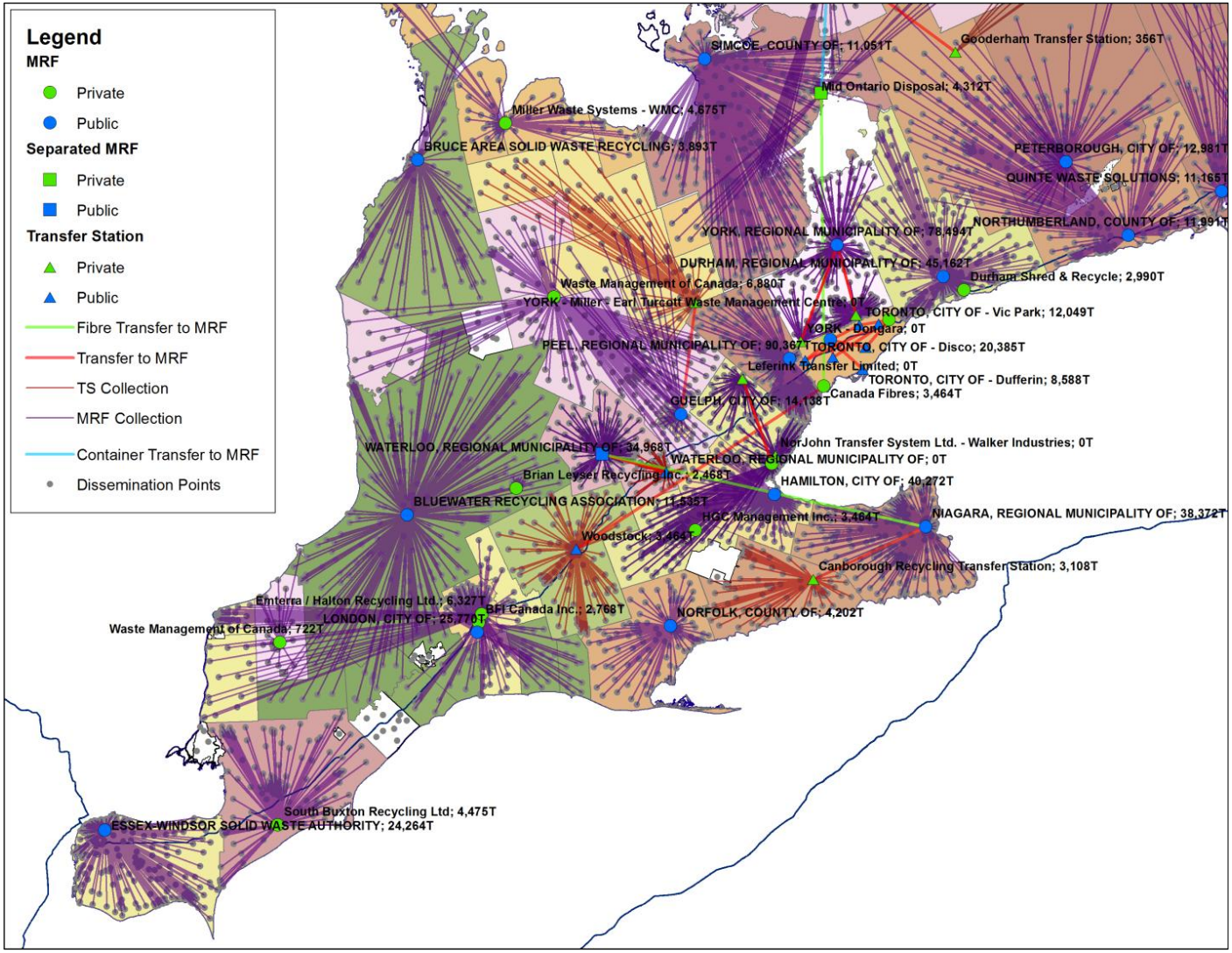
- Annual capital and operating cost:
  - All of the annual costs used are 'fully loaded' and include capital amortization, labour with benefits and operating costs. These fully-loaded operating costs are used even if an existing MRF or transfer station is used to ensure the cost reflects a sustainably financed system
  - These costs are totaled for each regional scenario and divided by the total tonnes handled to determine the regional average cost per tonne
- Capital costs are broken out as follows to provide information about the range of potential investment required, noting that new facilities could be financed through public funds or by the private sector:
  - Total capital in the system
  - Total capital for new MRFs and new transfer stations
  - Total capital for upgrades to existing MRFs, and
  - Total capital for conversions from existing MRFs to transfer stations and upgrades to existing transfer stations
  - No cost has been applied to assets that will be unused given that there likely could be residual value in the equipment and buildings could provide value through repurposing
- Effect on direct haul time
  - The effect of the different options on the collection system, which is beyond the scope of this analysis, would require a more detailed analysis of the collection operations in each locality because it would need to consider utilization rates of vehicles, numbers of routes, and the specific collection system
  - However, an indication of the relative effect of the option on the collection system resulting from changes to the number and location of aggregation points on the time required for direct haul from the end of collection routes or depot locations has been developed
  - These can be the basis for future analysis as part of more detailed transition planning
  - For each option the sum of the tonnes managed from each dissemination area multiplied by the corresponding time for direct haul between the location of the dissemination area (end of collection route or depot location) and aggregation points, (transfer station or MRF) is calculated
  - The figures (expressed as tonne-minutes) for each option are compared to those of the baseline and expressed as a percent difference

3. Southwestern Regional Options

The Southwestern region is characterized by several populated urban areas to the west of Toronto, including Burlington, Hamilton, Waterloo and London as well as less populated areas. The current system has 18 MRFs (9 public and 9 private). There are four transfer stations but most material is hauled directly to MRFs. Waterloo processes containers and transfers fibre to Niagara. Five of the MRFs have the capacity to process greater than 50,000 tonnes per year, 4 of which are publically-owned and noting

that Waste Management is building a new single-stream facility in Cambridge. With the exception of the Bluewater MRF and the Essex-Windsor MRF and Guelph, other MRFs generally process less than about 10,000 tpy of Blue Box material.

Figure 1: Existing System



3.1. Summary of Options

In the Southwestern region, the following options and variations were included in the analysis.

- Baseline: 1 MRF in Hamilton, and 1 in London (Natural Growth Recovery)
- Option 1: 1 MRF in Hamilton, 1 in London, and 1 in Windsor (Natural Growth Recovery)
- Option 1-So: 1 MRF in Hamilton, 1 in London and 1 in Southfield, MI (Natural Growth Recovery)
- Option 1-Wa: 1 MRF in Hamilton, 1 in Waterloo, and 1 in Windsor(Natural Growth Recovery)
- Option 2: 1 MRF in Hamilton, 1 in London, 1 in Waterloo, and 1 in Windsor (Natural Growth Recovery)
- Option 3: 1 MRF in Hamilton, 1 in London, 1 in Waterloo, 1 in Windsor, and 1 in Niagara Falls (Natural Growth Recovery)
- Variation A on the Baseline: Existing MRFs in Huron Park, Windsor, Norfolk, Niagara Falls, and Waterloo utilized as transfer stations. Existing MRFs in Hamilton and London (City MRF) utilized as a MRF.
- Variation B on the Baseline: Existing MRF in Guelph used as a transfer station and continued utilization of transfer stations in Cambridge (Waterloo) and Woodstock as transfer stations. These in addition to those used in Variation A.
- Variation C on the Baseline: All remaining MRFs and transfer stations (except BFI Canada & Emterra in London, Waste Management in Petrolia, and the Norjohn Transfer System Ltd in Burlington) are utilized as transfer stations (see Table 7 for full listing).
- High Recovery Baseline: Same as Baseline above but using the High Recovery tonnes
- High Recovery Option 1, 1-Wa, 2, 3: Same as Option 1, 1-Wa, 2, 3 above but using the High Recovery tonnes.
- Variation C on the High Recovery Option 1: Same as Variation C on the Baseline above but using the High Recovery tonnes

Table 1: Southwestern Region Summary

	Baseline	Option 1	Option 1-So	Option 1-Wa	Option 2	Option 3
Wasteshed Tonnes	298,000	298,000	298,000	307,100	307,100	307,100
# of TS	8	7	8	8	7	6
# of MRFs	2	3	3	3	4	5
# of Current MRFs-> TS	0	0	0	0	0	0
# of Current TS Upgrades	0	0	0	0	0	0
# of public MRFs shutdown or repurposed	8	8	8	9	9	9
# of public TS shutdown or repurposed	2	2	2	2	2	2
Total Capital Investment	$62,791,400	$65,954,000	$62,791,400	$89,297,000	$82,474,400	$75,651,800
Total Annual Operating Cost	$29,046,800	$29,759,000	$29,715,000	$31,270,500	$32,036,800	$33,212,600
Average Annual Operating/Tonnes	$97.46	$99.85	$99.70	$101.81	$104.31	$108.14
Relative Effect on Direct Haul % Diff. from Baseline	0.0%	0.0%	0.0%	15.8%	15.8%	15.8%

Table 2: Southwestern Region Variations

	Baseline A	Baseline B	Baseline C
Wasteshed Tonnes	298,000	298,000	298,000
# of TS	8	11	15
# of MRFs	2	2	2
# of Current MRFs-> TS	6	7	12
# of Current TS Upgrades	0	2	3
# of public MRFs shutdown or repurposed	1	0	0
# of public TS shutdown or repurposed	2	0	0
Total Capital Investment	$34,420,000	$36,090,000	$37,430,000
Total Annual Operating Cost	$29,078,700	$29,778,100	$31,103,200
Average Annual Operating/Tonnes	$97.57	$99.92	$104.36
Relative Effect on Direct Haul % Diff. from Baseline	21.2%	5.4%	-7.3%

3.1.1. Southwestern Region Capital Cost Summary

Table 3: Summary of Capital Cost on Options

Capital Summary	Baseline	Option 1	Option 1-So	Option 1-Wa	Option 2	Option 3
Total capital in system	$62,791,400	$65,954,000	$62,791,400	$89,297,000	$82,474,400	$75,651,800
Total capital for new MRFs	$49,341,400	$54,594,000	$49,341,400	$76,937,000	$72,204,400	$67,471,800
Total capital for new TS	$13,450,000	$11,360,000	$13,450,000	$12,360,000	$10,270,000	$8,180,000

- In the baseline, it is assumed that a new large MRF is built to handle the 197,047 tonnes of capacity needed at the Hamilton MRF, along with another large MRF in London to handle the 100,987 tonnes of capacity.
- In Option 1, it is assumed that a new large MRF is built to handle the 197,047 tonnes of capacity needed at the Hamilton MRF, along with a medium MRF in London to handle the 60,816 tonnes of capacity and a medium MRF in Windsor to handle 40,171 tonnes of capacity.
- In Option 1-So, it is assumed that a new large MRF is built to handle the 197,047 tonnes of capacity needed at the Hamilton MRF, along with a medium MRF in London to handle the 69,098 tonnes of capacity.
- In Option 1-Wa, it is assumed that a new large MRF is built to handle the 135,227 tonnes of capacity needed at the Hamilton MRF, along with a second large MRF in Waterloo to handle the 121,317 tonnes of capacity and a medium MRF in Windsor to handle the 50,674 tonnes of capacity.
- In Option 2, it is assumed that a new large MRF is built to handle the 135,227 tonnes of capacity needed at the Hamilton MRF, along with an intermediate MRF in London to handle the 52,321 tonnes of capacity, a medium MRF in Waterloo to handle the 79,420 tonnes of capacity and a medium MRF in Windsor to handle the 40,171 tonnes of capacity
- In Option 3, it is assumed that a new large MRF is built to handle the 101,800 tonnes of capacity needed at the Hamilton MRF, along with an intermediate MRF in London to handle the 52,321 tonnes of capacity, a medium MRF in Waterloo to handle the 79,420 tonnes of capacity, a small MRF in Windsor to handle the 40,171 tonnes of capacity, and a small MRF near Niagara Falls to handle the 33,427 tonnes of capacity

Table 4: Summary of Capital Cost on Variations for the Baseline

	Baseline A	Baseline B	Baseline C
Total capital for new MRFs			
Total capital for upgrades to Existing MRFs	$26,765,000	$26,765,000	$26,765,000
Total capital for new TS	$4,090,000	$4,090,000	$2,090,000
Total capital for conversions from MRF to TS & upgrades to existing TS	$3,565,000	$5,235,000	$8,575,000
Total	$34,420,000	$36,090,000	$37,430,000

- In all three variations on the baseline, a large MRF in Hamilton is assumed to be built on or near the site of the current MRF.

- In variation A on the baseline, MRFs in Huron Park, Windsor, Norfolk, Niagara Falls, and Waterloo are all converted to transfer stations. Two new medium transfer stations and one large transfer station are built as well.
- In variation B on the baseline, an additional MRF in Guelph is converted to a transfer station along with transfer stations in Cambridge (Waterloo) and Woodstock are continued as transfer stations. Two new medium transfer stations and one large transfer station are built as well.
- In variation C on the baseline, 15 total existing facilities are upgraded (7 medium and 8 large) with one new large transfer station still built in Sarnia.

Hamilton MRF Upgrade

This facility is located in a large, old building built in the 1950s. There is at least 14,000m^2 available, but it has columns in a 10m grid throughout the area. It is unclear, based on the data available what the ceiling height is. The AECOM report states that the ceiling peaks at just under 10m, but drawings of the container line shows a maximum height of 8m and much at less than 6m. Site photos suggest the lower height is likely correct. Less than 10m ceilings will severely limit the ability to install a high efficiency single stream system, especially running at 200,000+ Tpy. They will also limit the ability of compacting trucks to efficiently dump in the building. Finally the facility is only licensed to receive 78,000 Tpy. The CofA would need to be amended for this to be a Hub MRF.

The facility does have some usable equipment that could be integrated into an upgrade including an OCC screen, optical sorter, 3 bales and an ECS. However, most of this equipment will likely be undersized.

To be conservative, a full greenfield MRF capital cost is assumed for this facility. If the building is usable, that cost could be saved, as long it did not affect long-term operating cost. For the Baseline, where the facility is larger than our Large MRF, an equipment cost of 50% higher is used along with a $20 million building.

London MRF Upgrade

This facility was recently upgraded to be a regional MRF with a processing capacity of 75,000 Tpy. However, it is currently a dual stream system. No data was available from the AECOM report for an in depth review of upgrade cost. $5,000,000 was used assuming that the building is large enough and the majority of equipment could be reconfigured for optimal single stream processing and increased capacity.

3.2. Detailed description of each option

3.2.1. Baseline

The Baseline for the Southwestern Region (see Figure 2) contains 2 MRFs, 8 Transfer stations and handles 298,000 tonnes per year. The model indicates a total operating cost of $29,046,800 per year giving an average operating cost of $97.46 per tonne. All facilities are new resulting in a $62,791,400 total capital cost and shutdown of 8 Public MRFs and 2 Public transfer stations. Table 1 compares this scenario to others for the region.

The High Growth Baseline for the Southwestern Region (see Figure 3) contains 2 MRFs, 8 Transfer stations and handles 329,100 tonnes per year. The model indicates a total operating cost of $31,644,457 per year giving an average operating cost of $96.16 per tonne. All facilities are new resulting in a $78,376,065 total capital cost and shutdown of 8 Public MRFs and 2 Public transfer stations. Finally, the there is a 5.9% increase in the weighted time for direct haul from the end of collection routes or depot locations to aggregation points compared to the Baseline. Table 5 compares this scenario to others for the region.

Table 5: Baseline under High Growth

	High Baseline	High Option 1	High Option 1-So	High Option 1-Wa	High Option 2	High Option 3	High Baseline C
Watershed Tonnes	329,100	329,100	329,100	339,100	339,100	339,100	329,100
# of TS	8	7	8	8	7	6	16
# of MRFs	2	3	3	3	4	5	2
# of Current MRFs-> TS	0	0	0	0	0	0	12
# of Current TS Upgrades	0	0	0	0	0	0	3
# of public MRFs shutdown or repurposed	8	8	8	9	9	9	0
# of public TS shutdown or repurposed	2	2	2	2	2	2	0
Total Capital Investment	$78,376,100	$75,640,500	$64,255,417	$91,477,000	$92,876,800	$100,174,800	$74,907,000
Total Annual Operating Cost	$31,644,500	$32,420,700	$32,578,500	$33,652,500	$34,484,800	$35,686,400	$34,016,600
Average Annual Operating/Tonnes	$96.16	$98.52	$99.00	$99.23	$101.69	$105.23	$103.37
Relative Effect on Direct Haul % Diff. from Baseline	5.9%	5.9%	5.9%	31.0%	31.0%	31.0%	2.0%

3.2.2. Option 1

Option 1 for the Southwestern Region (see Figure 4) contains 3 MRFs, 7 Transfer stations and handles 298,000 tonnes per year. The model indicates a total operating cost of $29,759,000 per year giving an average operating cost of $99.85 per tonne. All facilities are new resulting in a $65,954,000 total capital cost and shutdown or repurposing of 8 Public MRFs and 2 Public transfer stations. Finally, the weighted time for direct haul from the end of collection routes or depot locations to aggregation points is the same as the Baseline. Table 1 compares this scenario to others for the region.

3.2.3. Option 1-So

Option 1 for the Southwestern Region (see Figure 5) contains 3 MRFs, 8 Transfer stations and handles 298,000 tonnes per year. The model indicates a total operating cost of $29,715,100 per year giving an average operating cost of $99.70 per tonne. All facilities are new resulting in a $62,791,400 total capital cost and shutdown or repurposing of 8 Public MRFs and 2 Public transfer stations. Finally, the weighted time for direct haul from the end of collection routes or depot locations to aggregation points is the same as the Baseline. Table 1 compares this scenario to others for the region.

3.2.4. Option 1-Wa

Option 1-Wa for the Southwestern Region (see Figure 6) contains 3 MRFs, 8 Transfer stations and handles 307,100 tonnes per year. This option handles more tonnes than the Baseline as material from the Bruce Peninsula, part of the Central Region Baseline is now closer to the MRF near Waterloo than the MRFs located in the Central Region. The model indicates a total operating cost of $31,270,500 per year giving an average operating cost of $101.81 per tonne. All facilities are new resulting in a $89,297,000 total capital cost and shutdown or repurposing of 9 Public MRFs and 2 Public transfer stations. Finally, there is a 15.8% increase in the weighted time for direct haul from the end of collection routes or depot locations to aggregation points due to the extra material from the Bruce Peninsula. Table 1 compares this scenario to others for the region.

3.2.5. Option 2

Option 2 for the Southwestern Region (see Figure 7) contains 4 MRFs, 7 Transfer stations and handles 307,100 tonnes per year. This option handles more tonnes than the Baseline as material from the Bruce Peninsula, part of the Central Region Baseline is now closer to the MRF near Waterloo than the MRFs located in the Central Region. The model indicates a total operating cost of $32,036,800 per year giving an average operating cost of $104.31 per tonne. All facilities are new resulting in a $82,474,400 total capital cost and shutdown or repurposing of 9 Public MRFs and 2 Public transfer stations. Finally, there is a 15.8% increase in the weighted time for direct haul from the end of collection routes or depot locations to aggregation points due to the extra material from the Bruce Peninsula. Table 1 compares this scenario to others for the region.

3.2.6. Option 3

Option 3 for the Southwestern Region (see Figure 8) contains 5 MRFs, 6 Transfer stations and handles 307,100 tonnes per year. This option handles more tonnes than the Baseline as material from the Bruce Peninsula, part of the Central Region is now closer to the MRF near Waterloo than the MRFs located in the Central Region. The model indicates a total operating cost of $33,212,600 per year giving an average

operating cost of $108.14 per tonne. All facilities are new resulting in a $75,651,800 total capital cost and shutdown or repurposing of 9 Public MRFs and 2 Public transfer stations. Finally, there is a 15.8% increase in the weighted time for direct haul from the end of collection routes or depot locations to aggregation points due to the extra material from the Bruce Peninsula. Table 1 compares this scenario to others for the region.

3.2.7. Southwestern Region Effects on the Central Region

Options that include a MRF in the Waterloo area (Option 1-Wa, Option 2, Option 3) attract material from near the Bruce Peninsula instead of sending it to the Central Region. This increases the Southwestern Region's tonnage from 298,000 to 307,100. The most direct comparison to understand this effect is to compare Option 1 and Option 1-Wa; the difference between these two options is the placement of a third MRF near either London or Waterloo. A facility near Waterloo would create two facilities that do not fully utilize both shifts in our Large Two-Shift MRF model. The facility near Waterloo would handle 121,300 tonnes at $81.41/tonne ($9,876,900/year) and the facility near Hamilton would process 135,150 tonnes at $78.64/tonne ($10,628,200/year) in Option 1-Wa. However, in Option 1 the facility near London would process 60,800 tonnes at $101.62/tonne ($6,180,000/year) and the facility near Hamilton would handle 197,000 tonnes at $71.45/tonne ($14,079,000/year). Therefore, with the third MRF in the Windsor, Option 1 overall runs at $99.85/tonne and Option 1-Wa at $101.81/tonne; a 1.9% difference.

In the Central Region, moving the material from the Bruce Peninsula to the Southwest lowers the overall operating cost per tonne from $96.13/tonne to $95.88/tonne; or a 0.3% difference due to the relative small tonnage compared to the total tonnage in the Central Region.

The net effect on the Central and Southwest regions is +0.33% and the province-wide system is +0.26%.

3.2.8. Baseline A

Baseline A for the Southwestern Region (see Figure 9) contains 2 MRFs, 8 Transfer stations and handles 298,000 tonnes per year. The model indicates a total operating cost of $29,078,700 per year giving an average operating cost of $97.57 per tonne. Due to the location of the existing facilities and assumptions about maximum direct haul time, many of the end-of-route haul locations are changed so that transfer distances overall increase, resulting in a higher operating cost. Since this scenario uses 6 existing facilities, a conversion investment replaces new build prices, therefore the model shows a $34,420,000 total capital cost and complete shutdown of only 1 Public MRFs and 2 Public transfer stations. Table 7 shows which current facilities would be utilized. Finally, there is a 21.2% increase in the weighted time for direct haul from the end of collection routes or depot locations to aggregation points since the Greenfield Aggregation Points are more evenly distributed between population centers than the current system public facilities. Table 2 compares this scenario to others for the region.

3.2.9. Baseline B

Baseline B for the Southwestern Region (see Figure 10) contains 2 MRFs, 11 Transfer stations and handles 298,000 tonnes per year. The model indicates a total operating cost of $29,778,100 per year giving an average operating cost of $99.92 per tonne. This scenario uses all public facilities; therefore, 3 more transfer stations are added to the operating budget. Since this scenario uses 9 existing facilities, a conversion investment replaces new build prices; therefore, the model shows a $36,090,000 total capital cost. Table 7 shows which current facilities would be utilized. Finally, there is a 5.4% increase in

the weighted time for direct haul from the end of collection routes or depot locations to aggregation points since the Greenfield Aggregation Points are more evenly distributed between population centers than the current system public facilities. Table 2 compares this scenario to others for the region.

3.2.10. Baseline C

Baseline C for the Southwestern Region (see Figure 11) contains 2 MRFs, 15 Transfer stations and handles 298,000 tonnes per year. The model indicates a total operating cost of $31,103,200 per year giving an average operating cost of $104.36 per tonne. This scenario uses all public and private facilities capable of handling the tonnages; therefore, 7 more transfer stations are added to the operating budget. Since this scenario uses 14 existing facilities, a conversion investment replaces new build prices; therefore the model shows a $37,430,000 total capital cost. Table 7 shows which current facilities would be utilized. Finally, there is a 7.3% decrease in the weighted time for direct haul from the end of collection routes or depot locations to aggregation points since the current facilities are closer to more of the population centers than the Greenfield Aggregation Points. Table 2 compares this scenario to others for the region.

Figure 2: Baseline for the Southwestern Region

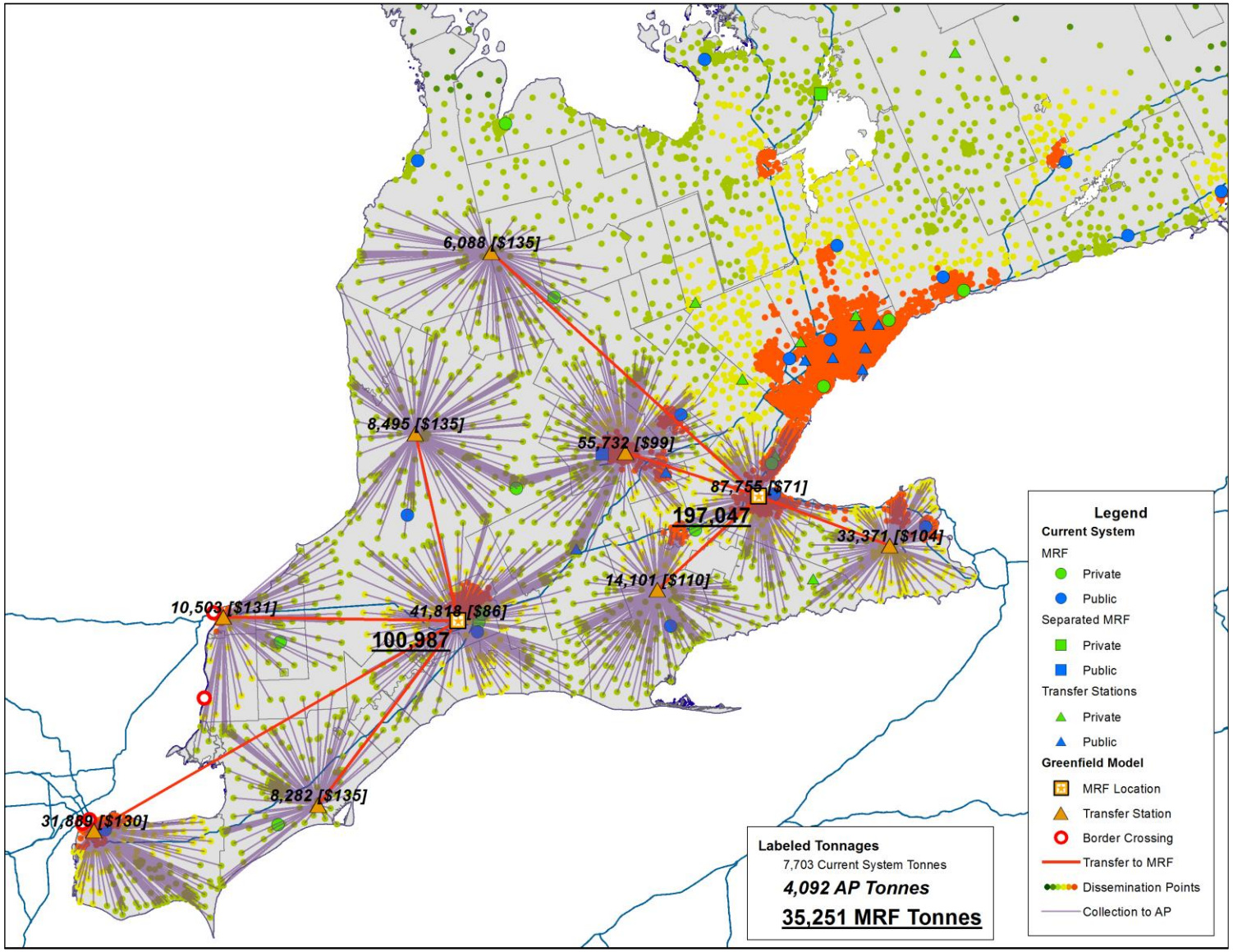


Figure 3: Baseline under the High Growth for the Southwestern Region

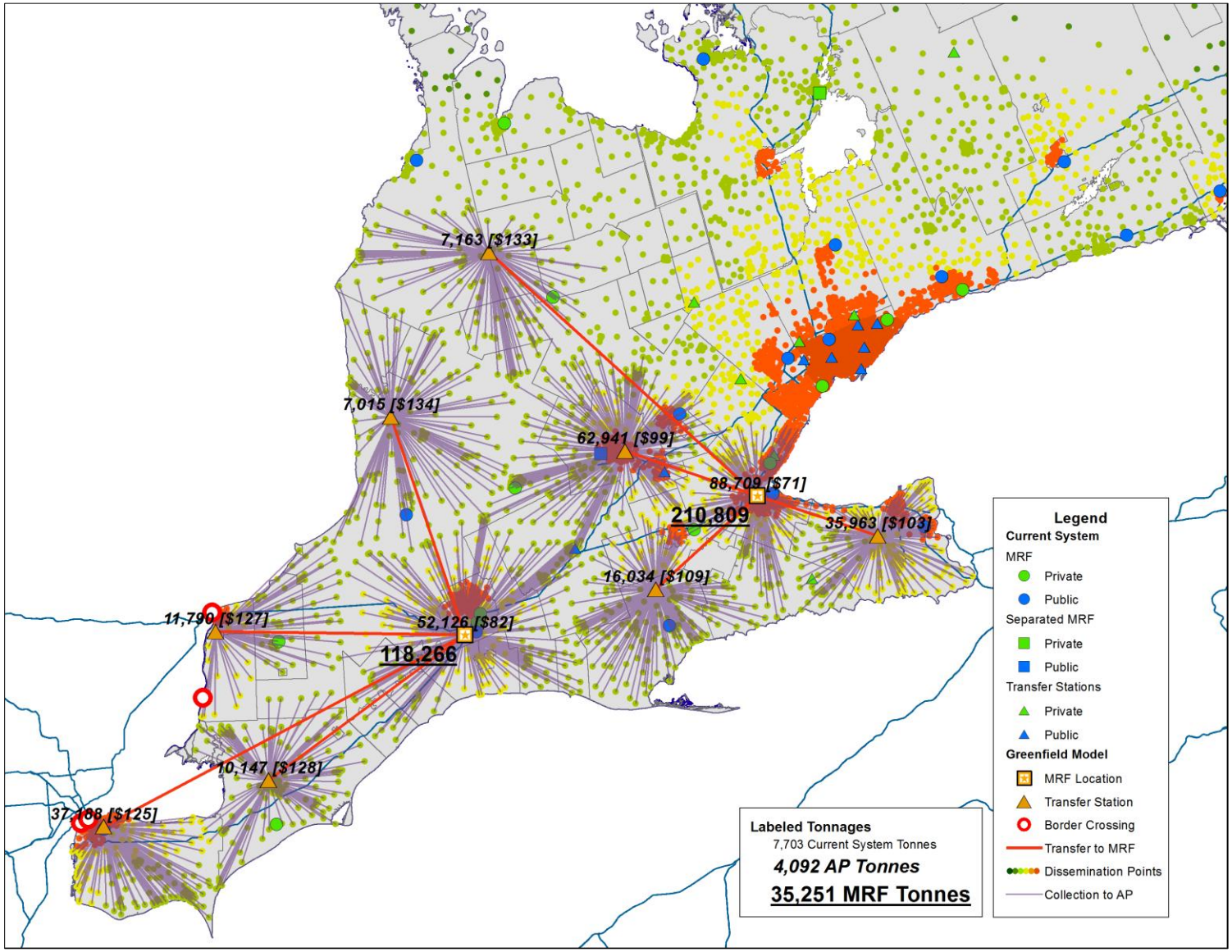


Figure 4: Option 1 for the Southwestern Region

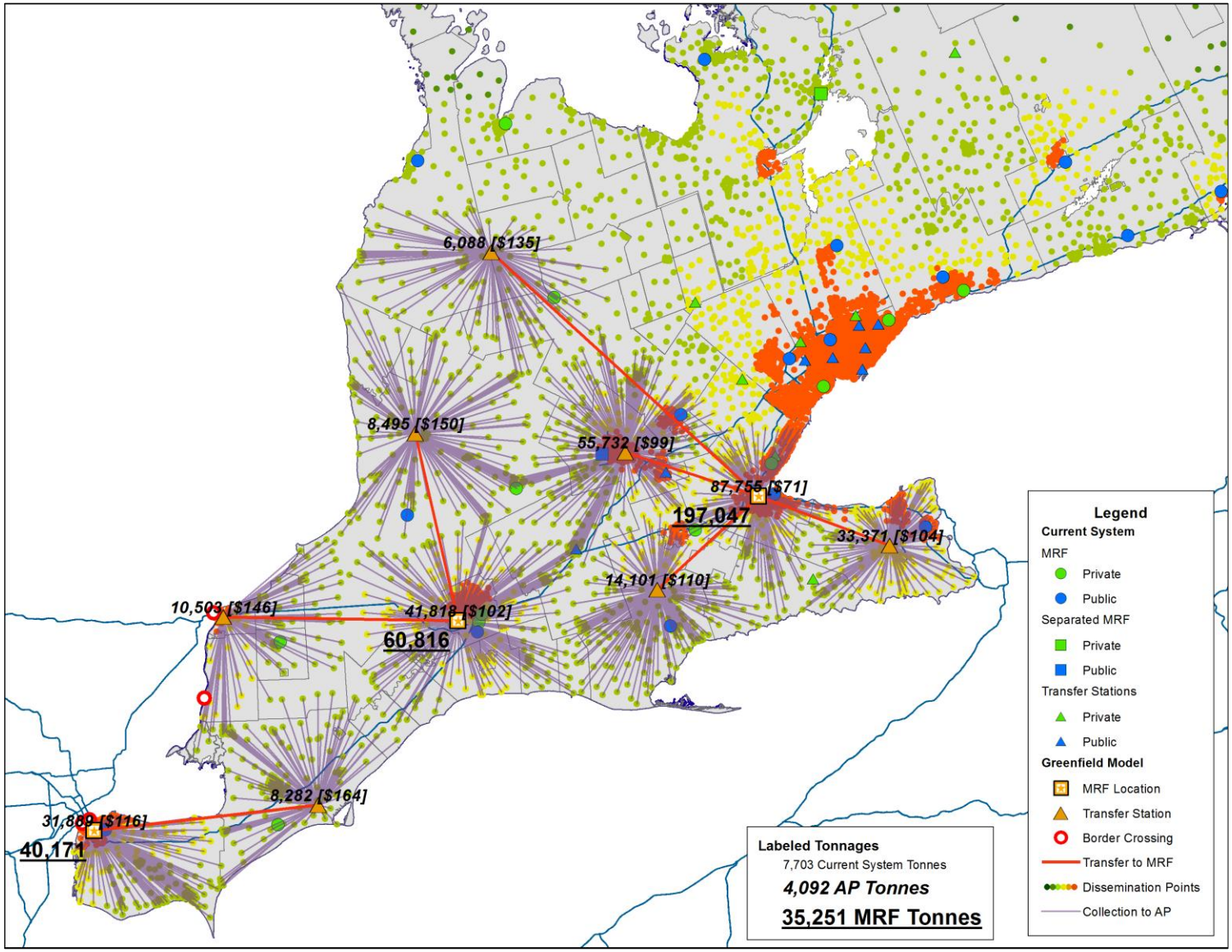


Figure 5: Option 1-So for the Southwestern Region

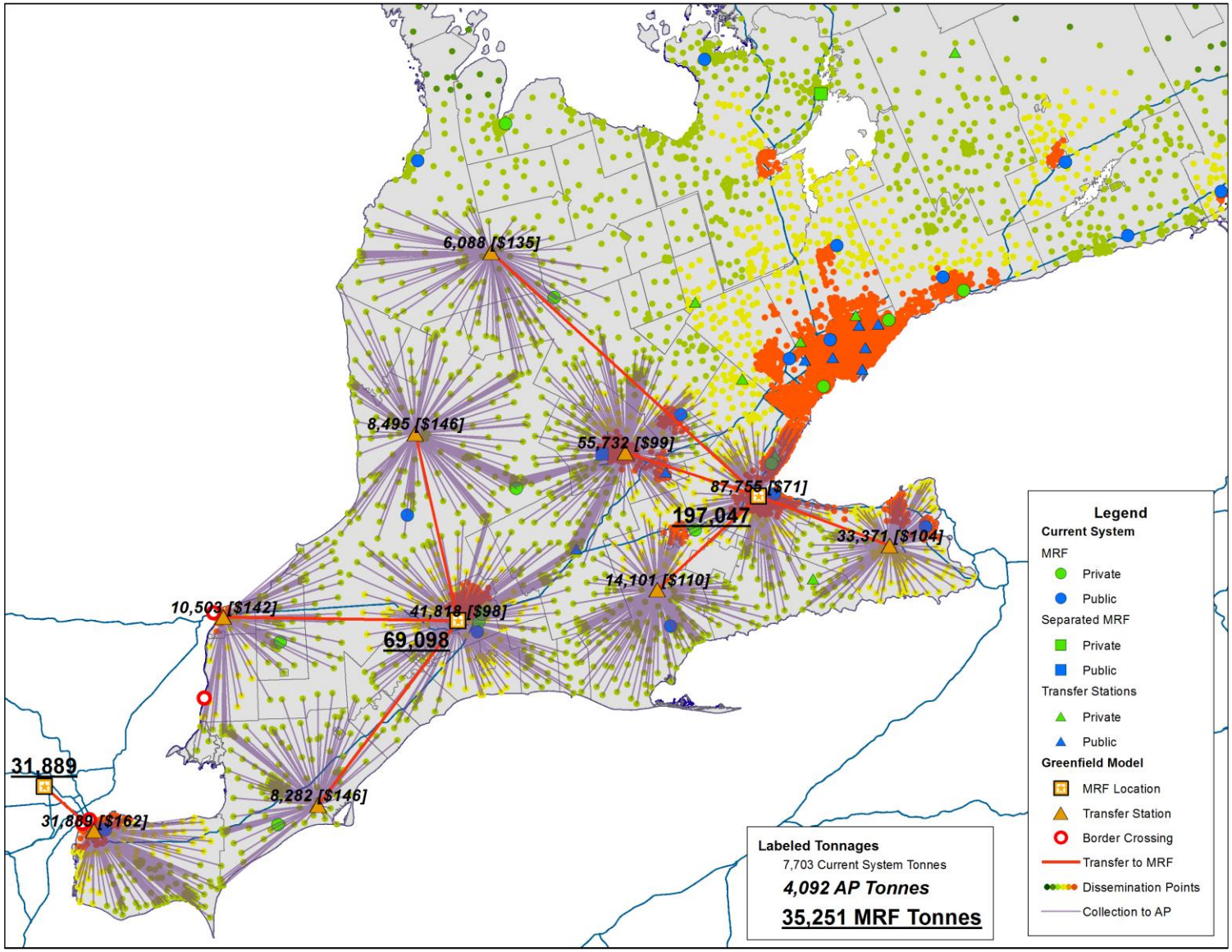


Figure 6: Option 1-Wa for the Southwestern Region

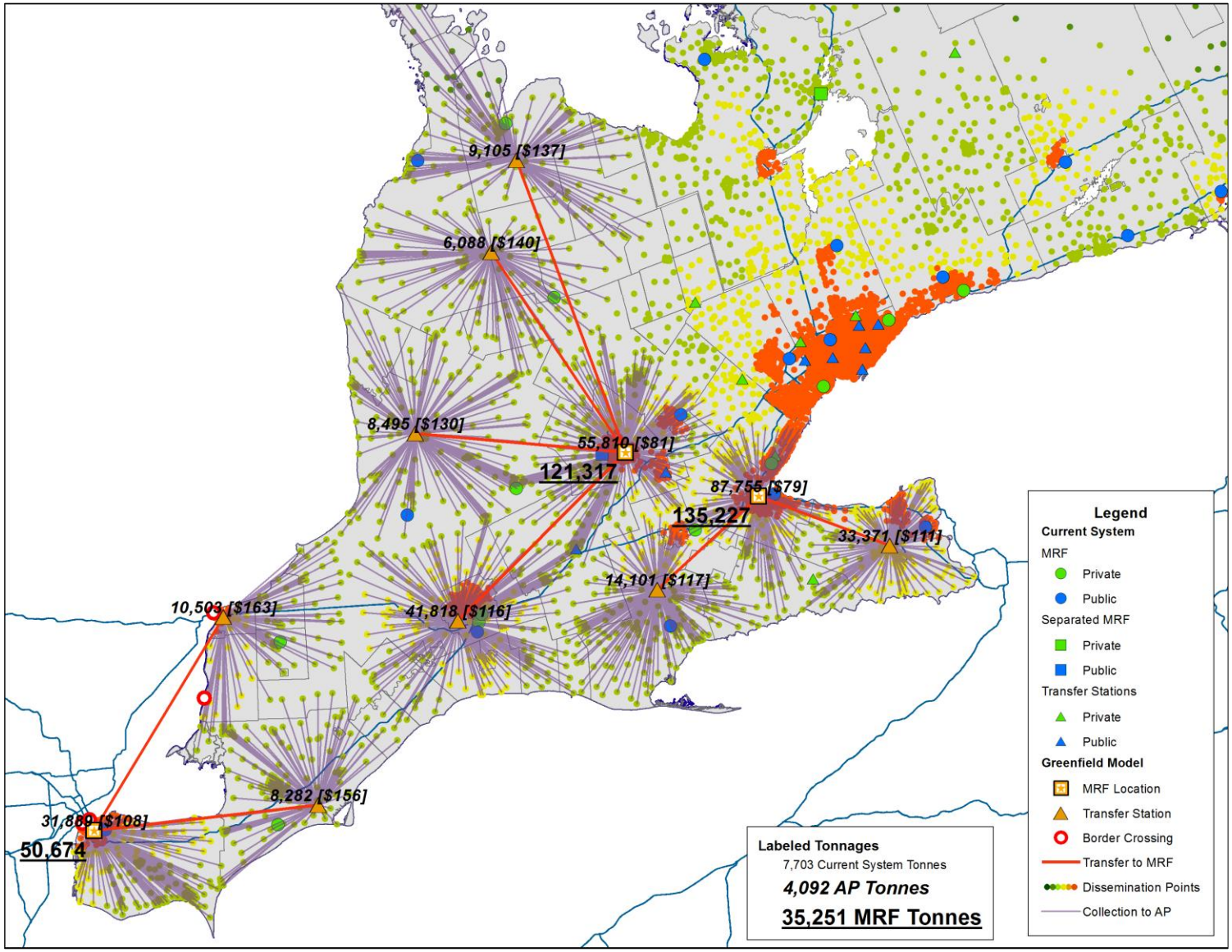


Figure 7: Option 2 for the Southwestern Region

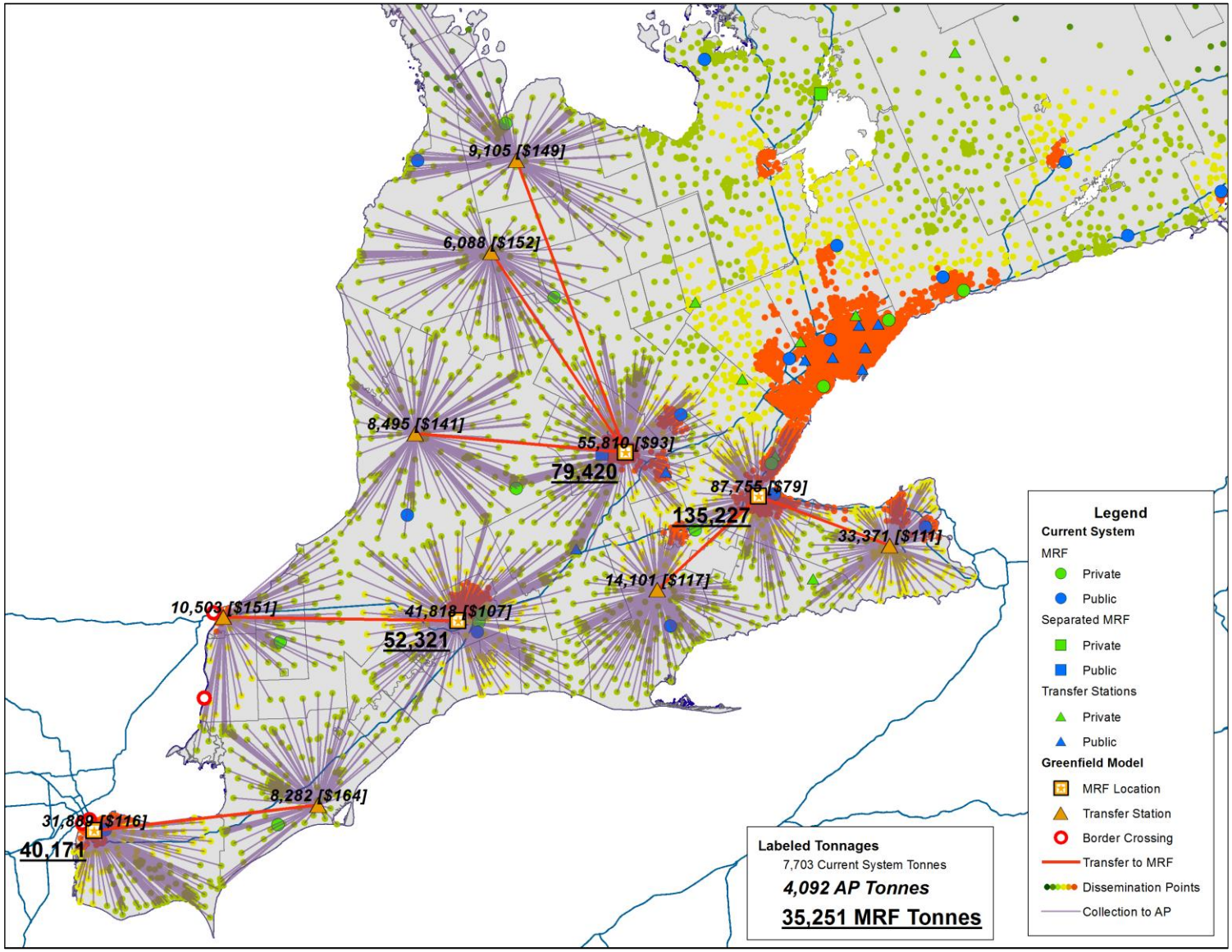


Figure 8: Option 3 for the Southwestern Region

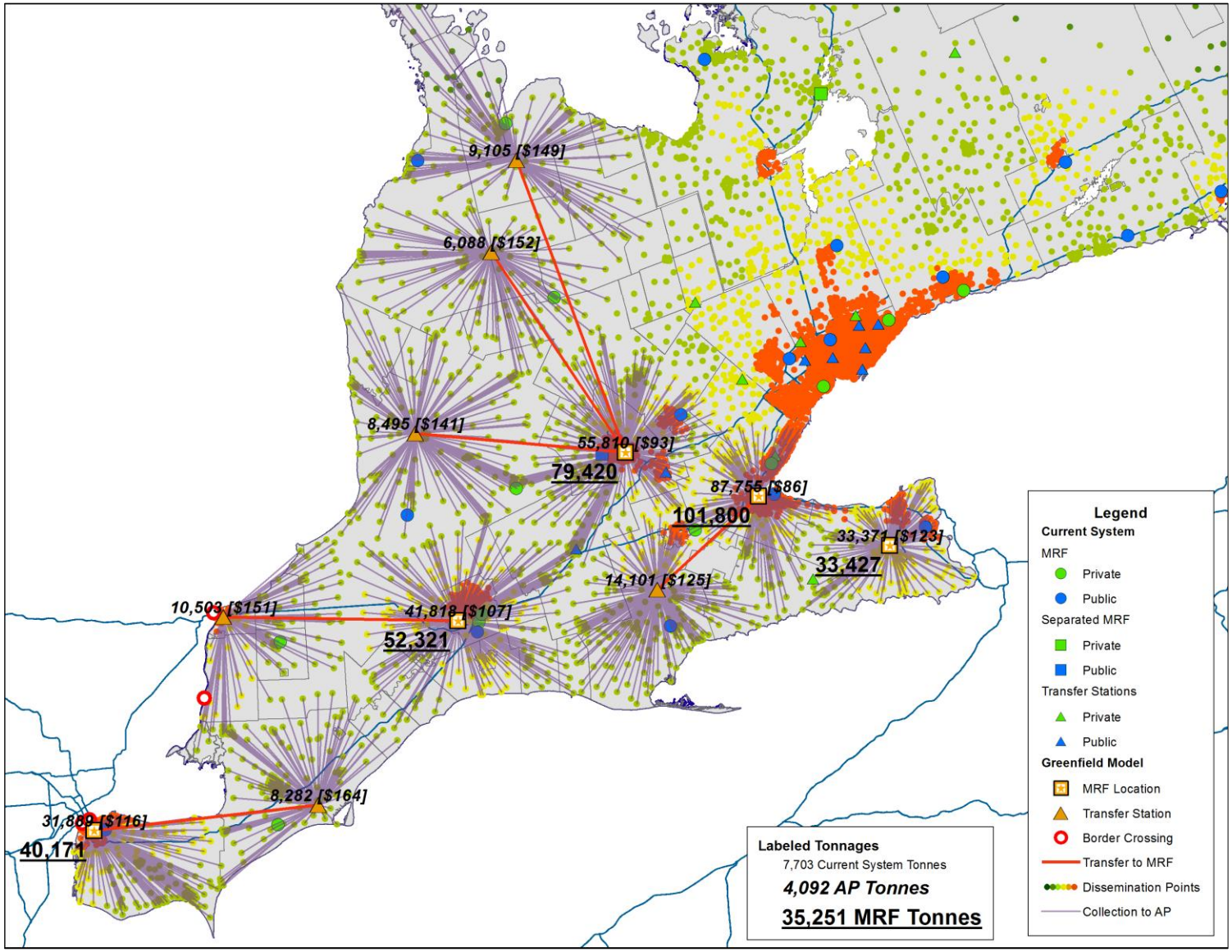


Figure 9: Baseline A for the Southwestern Region

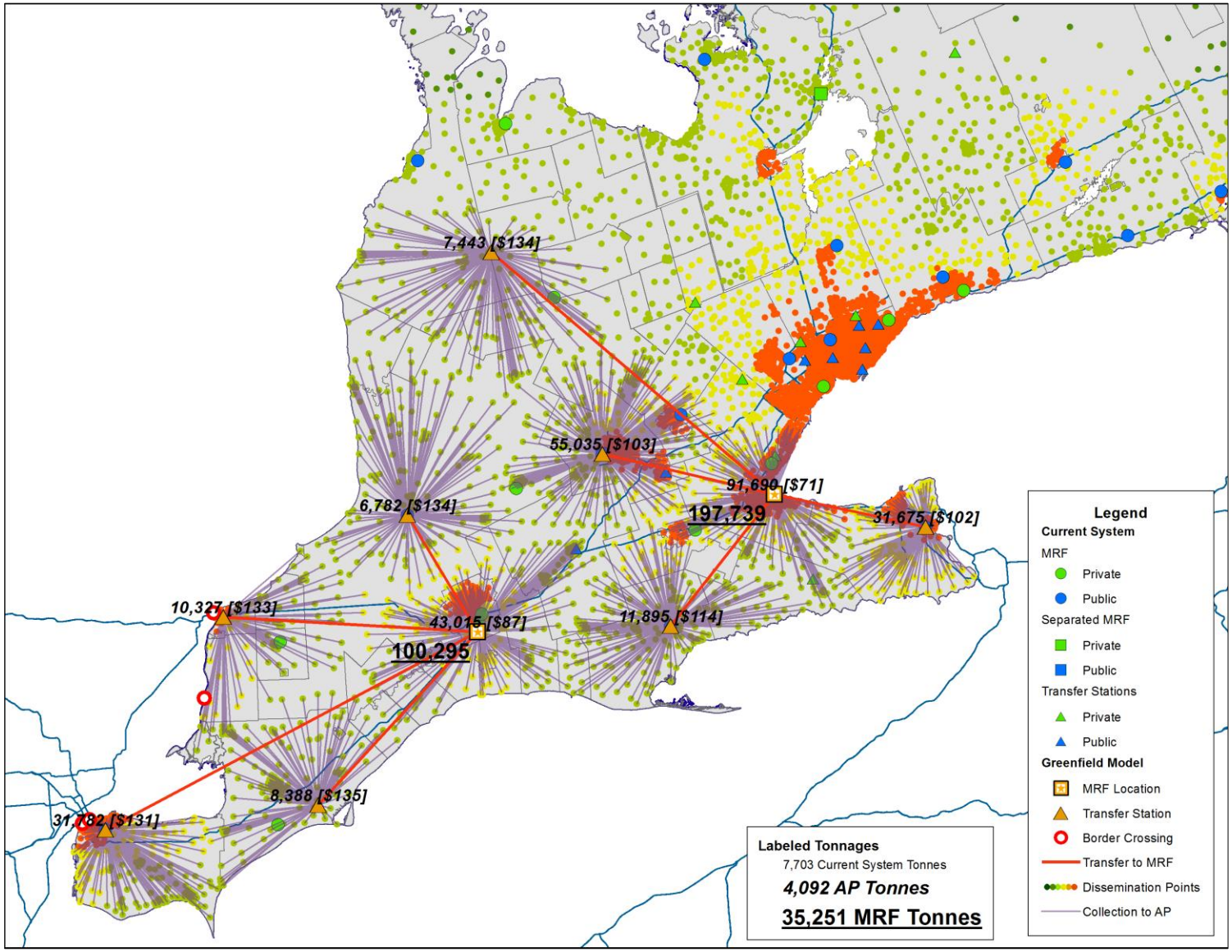


Figure 10: Baseline B for the Southwestern Region

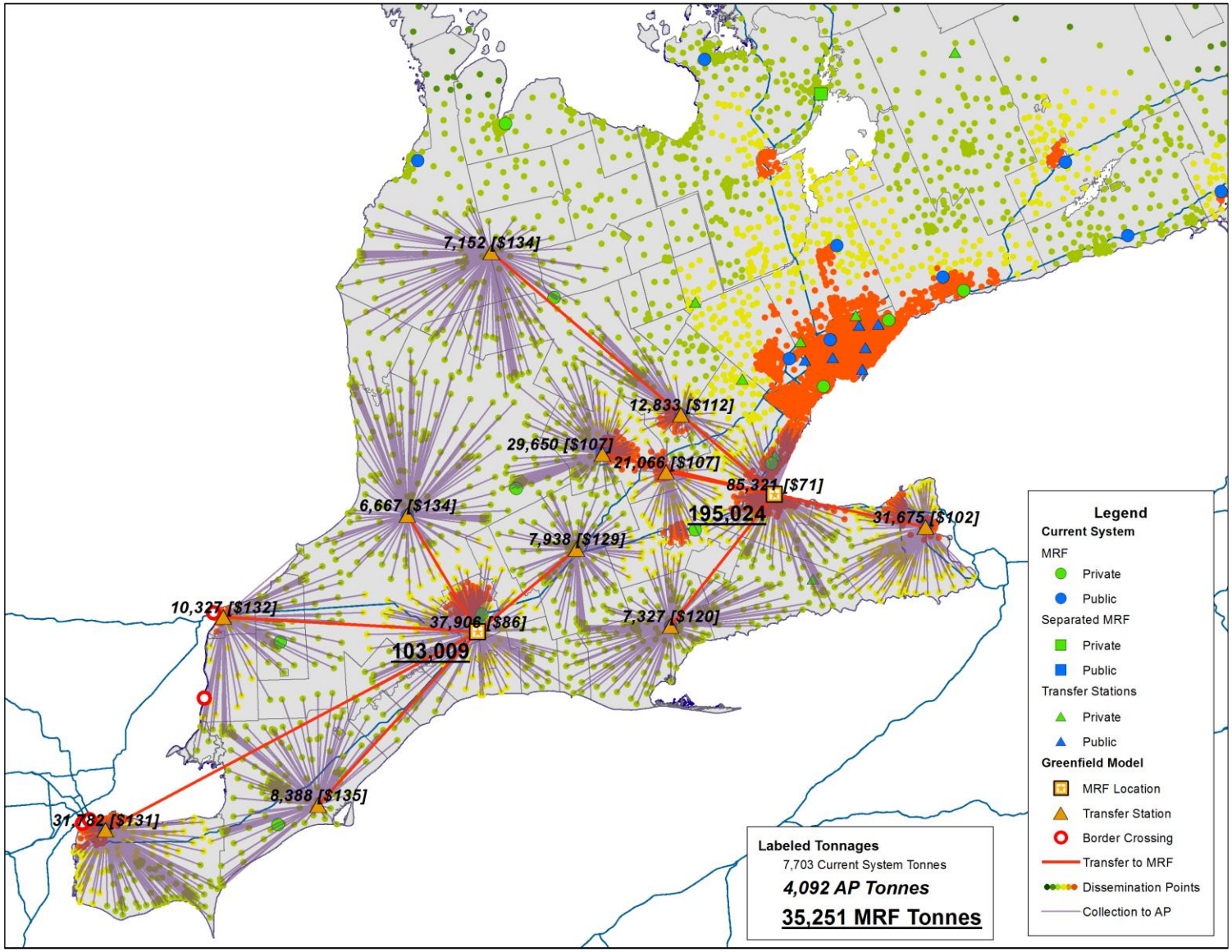
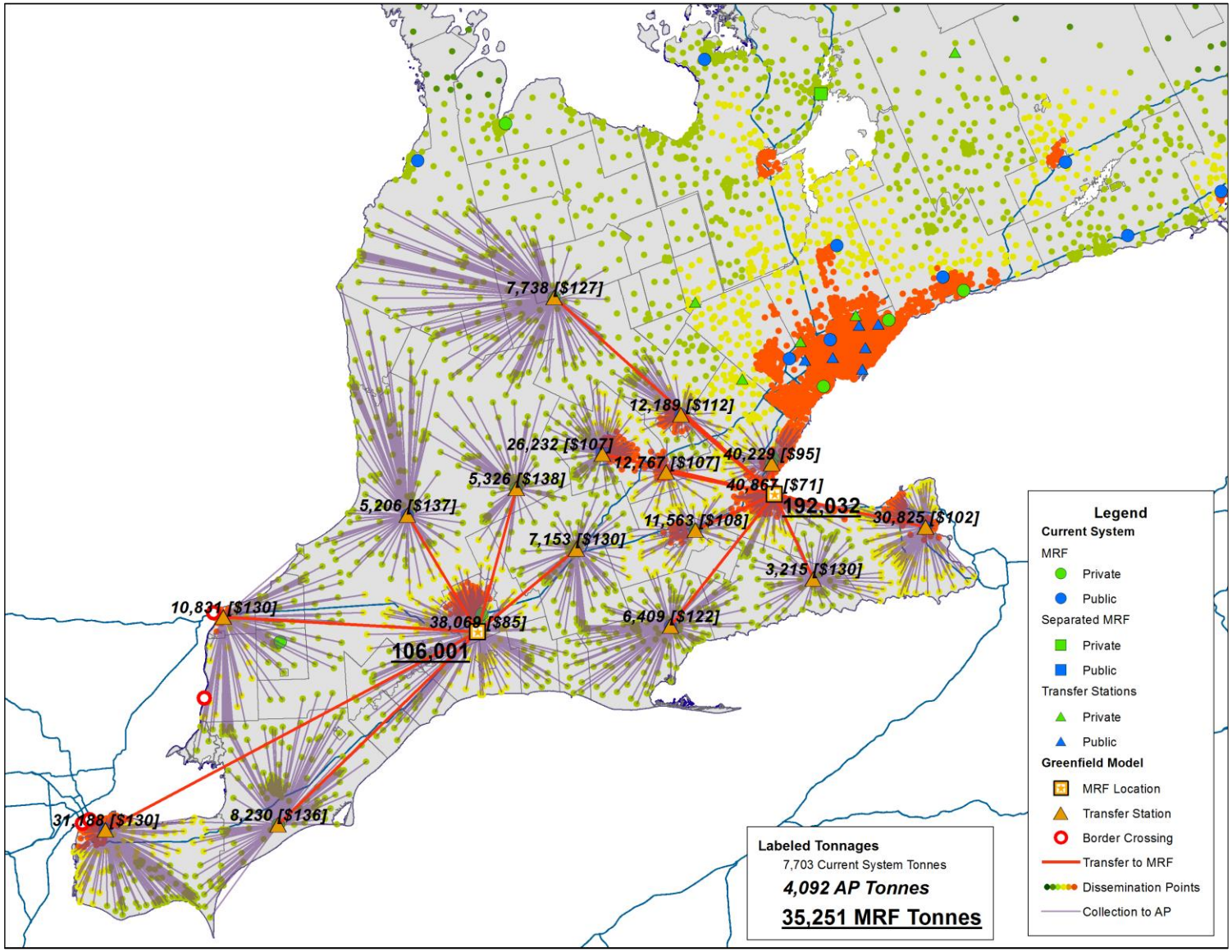


Figure 11: Baseline C for the Southwestern Region



3.2.11. Seasonal Tonnes

The effect of seasonal variation in the quantities of residential material recovered was based on seasonal households reported by municipalities and Stewardship Ontario data on seasonal per-household generation. Given these data and assumptions, the southwestern region does not have any aggregation points that will be significantly affected by those seasonal residential tonnage variations. However, further analysis of the local data will be required for actual design and sizing of all transfer facilities.

3.3. Southwestern Region Conclusions

Conclusions that can be drawn from the analysis for the Southwestern Region are:

- Savings can be achieved in this region by reducing the number of MRFs from 16 down to a minimum of 2 regional state-of-the-art MRFs that would anchor the processing and transfer system
- Developing a MRF in Waterloo instead of London increases the cost by 4% and replaces an existing asset with no obvious benefit
- Adding a Waterloo MRF in addition to London and Windsor increases costs by 7% but still achieves significant savings
- In the Southwestern Region, maximizing the use of existing facilities as transfer stations increases the costs by 7%, but could result in possible benefits from a lower effect on collection costs, especially given that long hauls already exist in the current system

The optimized Southwestern Region system could utilize more than the minimum number of MRFs:

- In the lowest cost option the transfer from Waterloo to Hamilton is at risk to escalating fuel costs
- Further using existing facilities in the Waterloo/Guelph areas as transfer stations lowers the impact on direct haul from collection routes
- This optimized strategy builds on the existing London MRF to anchor the processing and transfer system
- Given the large volume processed in this region, this approach provides greater redundancy with minor cost impacts, and also minimizes impact on direct haul (not quantified in this study), potentially offsetting the 7% increase in operating costs for using additional existing facilities

Developing additional supply into a London hub MRF together with a greenfield Hamilton hub MRF is likely a key part of moving towards an optimized system for the Southwestern Region.

4. Transition Plans

Optimization of the Blue Box recycling processing system for the Province of Ontario will take time, require the collaboration of a wide range of stakeholders and decision makers incorporating trade-offs during implementation and be a process of continuous improvement that always looks forward as the material stream changes and technology improves.

The transition path from current facilities, operational arrangements, responsibilities and funding, to more optimized Blue Box recyclables processing will vary for each current municipal MRF and/or transfer station location and for each community that delivers Blue Box material to that location.

Transition plans have been prepared as part of this study to outline the process that these municipal MRF and/or transfer station locations and affected communities may want to move through as options for optimization of the Blue Box recycling processing system are considered and then implemented. The

transition road maps are not intended for privately-owned MRFs or transfer stations. However, municipalities should consider contracting with private sector facilities where applicable.

Broadly speaking, the following types of transition plans have been developed, given the most common outcomes for each location:

- An existing municipal MRF will:
  - remain a MRF in current or upgraded form
  - convert to a transfer station
  - no longer have a role in the Blue Box system – to be repurposed or a stranded asset
- An existing municipal transfer station (TS) will:
  - remain a transfer station
  - no longer have a role in the Blue Box system – to be repurposed or a stranded asset
- A new greenfield MRF or TS in a new location may be required and some communities with no facilities or with facilities that will become stranded assets may need to sponsor development of or commit tonnage to that new greenfield MRF or TS

Communities that aren't directly sponsoring a MRF or TS in the new system (called in this report "direct haul communities") will need to choose the MRF or TS facilities to which they will deliver their Blue Box recyclables, i.e. existing municipal facilities, new greenfield facilities or existing private sector facilities Many factors will drive the process of actual transition for each current municipal MRF and/or transfer station location and its affected communities, some of which will be within the control of the stakeholders and decision makers involved in the process and some of which will not be.

Consider the following factors that will not be able to be controlled:

- Overall structure of the Blue Box system as determined by provincial law
- System funding structure - partial producer responsibility with reimbursement or shift to 100% producer responsibility with greater control
- Status of the location's CofA – does it allow change to take on a new role
- Private MRFs, existing or new, that may offer viable alternatives
- Timing of decision-making in transition plans for other municipal facilities that may affect your facility and community and your transition process
- Availability of funding from CIF or equivalent future program
- Realities of underlying costs that affect optimization and have been taken into account in this study (fuel costs, direct haul times, transfer costs and distances, MRF operating costs, economies of scale, available technology, etc.)

The best transition process will take into account these realities while integrating the many factors that are in the control of stakeholders and decision makers, including:

- Timing – how soon will the community begin the transition planning process for their facility
- Speed – how quickly will the community move through the transition planning process
- Supply – currently the communities that supply the facility choose where to take their material and are responsible for all arrangements for that delivery
- Cost Share – currently the facility's costs are partially covered by municipal partners
- Vision and Goals – the facility and affected communities must develop their own vision and goals for optimizing their Blue Box system, given the realities presented above, and make choices that best represent their interests and the larger mission.

The transition plans presented in this section for the Southwestern Region are designed to build in consideration of these factors. A variety of decision support tools are suggested in order to facilitate the process of both developing and implementing transition plans towards a more optimized Blue Box system for your region.

Some of these tools have already been provided as part of this body of work, including:

- The Blue Box processing optimization model: This CIF-funded study has resulted in the development of a GIS (Geographical Information System) decision support tool. The tool incorporates and analyzes data on the physical realities of your facility and affected communities (location of the households in each community, direct haul times from those locations, transportation routes and time/cost to transport, operating costs for transfer and processing, etc.). This tool is available to support your transition planning process as final solutions for optimization are being considered.
- The preliminary cost assumptions developed with the model: The CIF funded the development of cost data for transfer of recyclables across the province and for processing of recyclables into market ready commodities – cost information that can inform decision making as you move forward in your transition planning process.
- The preliminary options developed with the model: The CIF funded the use of the model to evaluate and present the most promising optimized solutions for each region, each municipal facility and each community – using the best information available to the study team at that time.

This section and Volume 8 include the following additional decision support tools:

- Decision Tree for Each Municipal Facility and Greenfield Location: Decision trees have been prepared for the situation of each location and its affected communities that describe a process for sifting through the preliminary options developed with the model and presented in this study. These decision trees identify "go/no-go" decision points at key stages in the process, given the specific options available to that location in an optimized system.
- "Go/No-Go" Decision Support Tools: At each of these "go/no-go" decision points the transition plans identify decision support tools and processes that can be used to move through that decision point.

4.1. Transition Plan Summary - Decision Trees and Lookup Tables

Each regional transition plan summary has a set of "lookup tables" that allow each municipal and greenfield facility and affected communities to determine how they fit into the baseline scenario or the options that vary from baseline for that particular region.

These lookup tables help guide each municipal facility or community as it undertakes the process of moving through a series of the "decision trees" that have "go/no-go" decision points for determining the most favourable outcome for their role in an optimized Blue Box recycling processing system.

The lookup tables help the municipal facility or community identify:

- What role it might play in a regional hub and spoke system – as a "hub" MRF, a "spoke" transfer station, or a feeder "direct haul" supply of Blue Box recyclables.
- How these roles might vary under the different options that are under consideration in a region.
- What key drivers will push the decision-making timeline in the hub and spoke system that they may be part of – contract expiration dates for existing MRF arrangements as an example.

- How greenfield MRF or TS development or private merchant capacity might be a factor in the hub and spoke systems they are potentially involved in.

The lookup tables then link with specific decision trees that are matched to that facility or communities' unique circumstances. These decision trees link, guiding the process in the right direction based on the "go/no-go" decisions that are made by the affected parties.

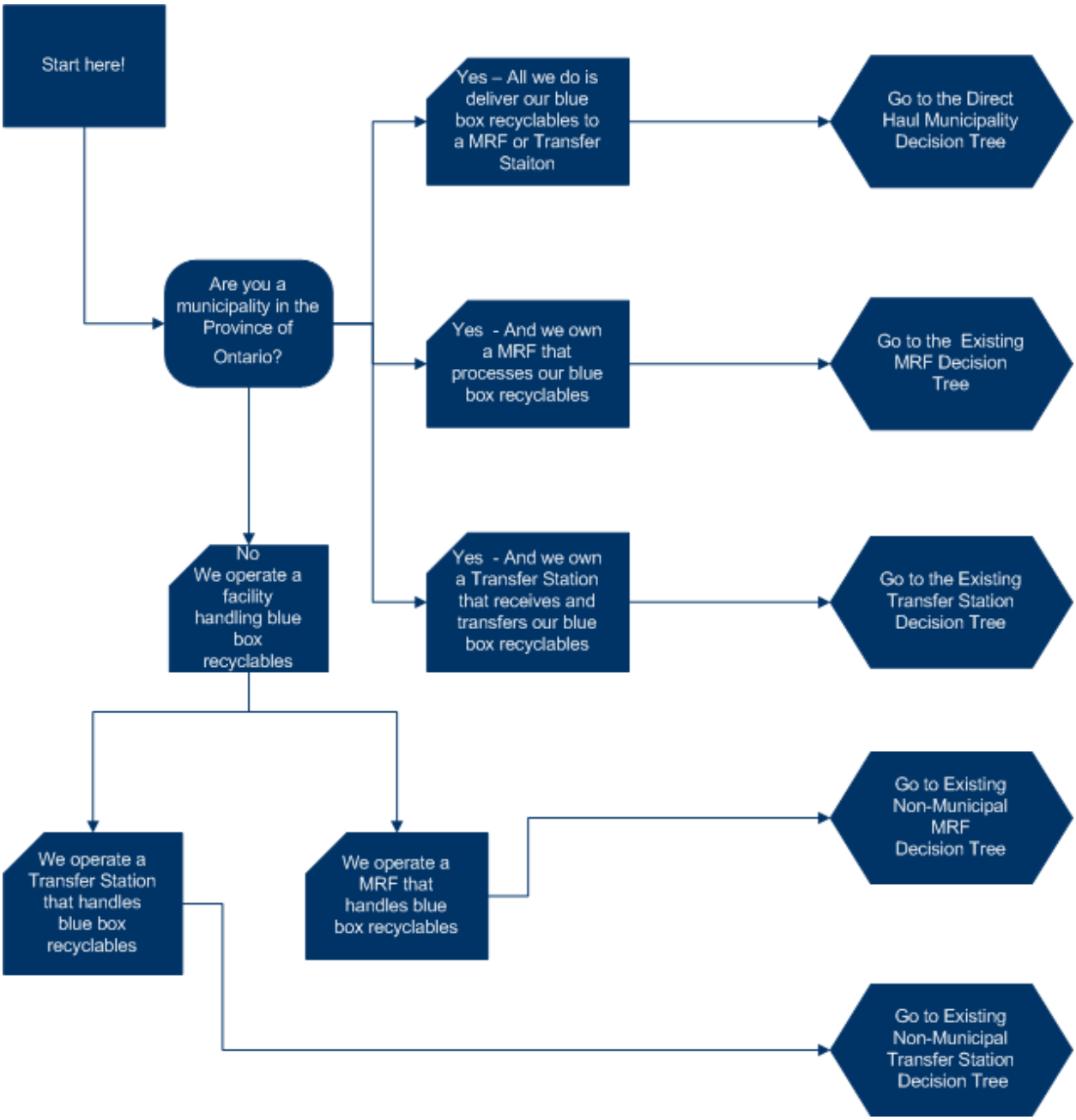
This series of decision trees move the user through key questions. Are they direct haul only? Do they operate a MRF? Do they operate a transfer station?

The decision tree then directs the user to the next sequential decision tree. For example:

- A direct haul only community would move to the "Direct Haul Municipality" decision tree that would then provide a road map for the steps and go/no-go decisions applicable to that situation.
- A municipality that operates a MRF would move to the "Existing MRF" decision tree with steps to evaluate its role as either an upgraded MRF, a complete rebuild MRF, a transfer station conversion or no role, i.e. a stranded asset.

These decision trees guide the transition plan for each facility and community and they are iterative. For example, a community with a MRF that will become a stranded asset then becomes a "Direct Haul Municipality" and then moves through that decision tree process.

Figure 12: Moving Through Your Transition Plan for an Optimized Blue Box Processing System



There are decision trees for every type of situation and outcome anticipated by the Blue Box processing optimization model.

- Direct Haul Municipality decision trees anticipate their delivery to either an existing or proposed MRF or transfer station, the potential to host a new greenfield MRF or transfer station and the possibility that private merchant capacity or a solid waste authority's capacity may be utilized.

- Existing MRF decision trees anticipate outcomes that include marketing of excess capacity, a major MRF upgrade, a complete MRF rebuild, conversion to a transfer station or the outcome of no role – repurpose or a stranded asset.
- Existing TS decision trees similarly anticipate marketing of excess capacity, a major upgrade, a complete rebuild, or the outcome of no role, i.e. repurpose or a stranded asset.
- New greenfield MRFs or Transfer Stations are accommodated.
- The potential interest of private merchant or other non-municipal (e.g. solid waste authority) capacity is anticipated in the process as well.

The Blue Box processing optimization model informs the transition planning process, as shown in each decision tree. The study results or new runs of the model identify roles and evaluates new variations as they surface. For example:

- Evaluation of an existing site location takes into account site constraints that could include CofA compliance questions, possibility of a successful CofA amendment, or the potential for an alternative site if CofA or other site issues cannot be resolved.
- A technical plan for the proposed project (upgrade, conversion to TS, etc.) is developed and the underlying business case justification is formulated – essentially that next level of technical and cost analysis needed to move forward.
- Negotiations with users, the municipalities whose recyclables (direct haul or transfer) will provide the necessary baseload of materials to allow the project to be financed and thus developed.
- The final stages of go/no-go decision-making as the project is coming together, all supply sources commit, the CofA is amended if required and financing, design, build and operation is authorized.
- Private merchant capacity options are considered.

Details on each type of decision tree, including the different components described above are provided in Volume 8.

4.2. Optimized Processing in the Southwestern Region

Moving to a more optimized Blue Box processing system in the Southwestern Region will require focused effort by the following stakeholders over a long period of time:

- The CIF, or similar champion, will need to provide leadership, direction and resources in the optimization process.
- The Hub MRF(s) and its host communities or sponsoring agencies will need to take responsibility for development of this key component of the optimized hub and spoke system.
- The Spoke Transfer Stations and their host communities or sponsoring agencies will need to take responsibility for development of these key aggregation points in the optimized hub and spoke system.
- The Direct Haul communities will need to take responsibility for any changes in their delivery locations for their Blue Box recyclables in the optimized hub and spoke system.
- All existing locations servicing the current Blue Box processing system will need to transition their facilities to new functions under the optimized hub and spoke system.

The length of time for the transition period to be completed cannot be predicted with any certainty. It could move quicker than anticipated with good coordination, appropriate resources, strong commitment on the part of all stakeholders and perseverance to surmount the many obstacles that will

arise. It also could take much longer than needed if good coordination is not provided, if the resources are not available, and if obstacles and other conflicting demands for attention of key stakeholders distract from the goal of moving toward an optimized Blue Box processing system.

4.2.1. Southwestern Region Lookup Tables

The results of the optimization model for the Southwestern Region presented in this volume provide a robust set of opportunities to achieve optimization. Table 6 identifies the Hub MRFs, development of which will be central to the success of an optimized Blue Box processing system for the region. The Baseline and all 3 Options include the Hamilton and London Hub MRFs. The Windsor Hub MRF is part of all 3 Options, but not Baseline. The Waterloo Hub MRF is part of Options 2 and 3 only, and the Niagara Hub MRF is part of Option 3 only.

Table 6: Hub MRFs

Hub MRF	Baseline	Option 1	Option 2	Option 3
Hamilton	YES	YES	YES	YES
London	YES	YES	YES	YES
Windsor		YES	YES	YES
Waterloo			YES	YES
Niagara				YES

Table 7 shows the transition of existing locations to their new potential functions in the Baseline A, B and C scenarios. Some of these existing locations have potential for Hub MRFs roles – specifically Hamilton and London in all options. Some locations have expected roles as transfer station roles in the baseline (e.g. Bluewater, Essex/Windsor, Norfolk, Niagara Falls and Waterloo) unless they are designated as potential Hub MRFs. Most locations have potential under at least one scenario for a transfer station role in the optimized system.

Table 7: Role in Optimized Processing System for Current System Locations

Facility Owner	City	Province	Current Tonnes	Baseline A	Baseline B	Baseline C
Bluewater Recycling Association	Huron Park	ON	11,534.5	TS	TS	TS
BFI Canada Inc.	London	ON	2,768.2			
Bruce Area Solid Waste Recycling	Southampton	ON	3,892.9			
Brian Leyser Recycling Inc.	Stratford	ON	2,467.5			TS
Emterra Recycling Ltd.	Burlington	ON	50,005.7			TS
Emterra Recycling Ltd.	London	ON	6,326.6			
Essex-Windsor Solid Waste Authority	Windsor	ON	24,263.8	TS	TS	TS
Guelph, City of	Guelph	ON	14,137.9		TS	TS
Hamilton, City of	Hamilton	ON	40,272.2	MRF	MRF	MRF
HGC Management Inc.	Brantford	ON	3,463.6			TS
London, City of	London	ON	25,770.0	MRF	MRF	MRF
Miller Waste Systems	Owen Sound	ON	4,674.9			
Norfolk, County of	Norfolk	ON	4,201.6	TS	TS	TS
Niagara, Regional Municipality of	Niagara Falls	ON	73,340.7	TS	TS	TS
South Buxton Recycling Ltd	Merlin	ON	4,475.0			TS
Waterloo, Regional Municipality of	Waterloo	ON	34,968.4	TS	TS	TS
Waste Management of Canada	Mount Forest	ON	6,880.1			TS
Waste Management of Canada	Petrolia	ON	722.1			

Facility Owner	City	Province	Current Tonnes	Baseline A	Baseline B	Baseline C
TS - Canborough Recycling Transfer Station	Dunnville	ON	3,107.8			TS
TS - Norjohn Transfer System Ltd. - Walker Industries	Burlington	ON	20,867.9			
TS - Waterloo, Regional Municipality of	Cambridge	ON	UNKNOWN		TS	TS
TS - Woodstock	Woodstock	ON	3,463.6		TS	TS

Direct haul communities that do not have existing facilities can use Table 8 to determine which transfer stations and or hub MRFs are potential delivery points for their Blue Box recyclables under the various options.

4.2.2. Transition Plan Considerations

As these locations and municipalities move through the transition process of evaluating the future of their facility or the destination for their material in the optimized system they will need guidance in two forms:

- Leadership and Direction: We recommend that influential players such as WDO, AMO and Stewardship Ontario work with the government and other stakeholder forums such as the Regional Public Works Commissioners of Ontario (RPWCO) to support and mandate the CIF, or similar champion to take steps to promote and guide the transition process in the Southwestern Region. These steps are outlined below.
- Work Plan: The sequence of steps in the specific transition plans for each of the above locations and municipalities is rooted in the Decision Tree based transition planning process overview provided in section 4 above – further outlined for each key stakeholder group below.

Leadership

In order to achieve progress toward an optimized hub and spoke system in the current regulatory context, it is essential that the CIF, or similar champion, be supported and mandated to continue to press forward with region-wide review, discussion and tweaking of the initial results of the optimization model for the Southwestern Region. This would require resources and could be accomplished using the CIF staff with technical support to implement decision tree processes and actively use the dynamic GIS hub and spoke model. There are a number of key process outcomes that these leadership activities should include:

- Individual consultation: Providing one-on-one review of location specific recommendations
- Dialogue opportunities: Most easily achieved by hosting regional optimization summits
- Updated modelling: Putting additional analysis together to address remaining issues
- Transition plan technical and process support: Helping locations through their transition plans
- Seed capital resources: Funding a portion of key investments to seed system development

In the Southwestern Region, it is clear that the Hamilton Hub MRF and London Hub MRF are key to progress in moving towards an optimized hub and spoke Blue Box processing system. Depending on the outcome of the CIF or other leadership activities, one or more of the remaining potential Hub MRFs could also be critical to progress (Windsor, Waterloo and Niagara).

Hub MRF Development

Towards that end, the Existing MRF Decision Tree is the starting point for identifying the Hub MRF development track for the Hamilton, London, Waterloo, Windsor and Niagara locations.

Private Merchant MRF Processing Capacity

The impact of potential private merchant MRF processing capacity on the Hub MRF development process in the Southwestern Region will be a significant factor in the transition to an optimized hub and spoke Blue Box recyclables processing system would play in the system, including the planned Waste Management Inc. MRF near Cambridge. The Transition Plan Decision Trees provide a mechanism for consideration of the value proposition that these private service providers could offer in determining whether they are a viable alternative approach to development of the Hub MRFs described in the options.

Spoke Transfer Station Development

The Spoke Transfer Stations for the Southwestern Region under each option are driven by existing locations that need to move through transition plans guided by the Transfer Station Conversion for Existing MRF Decision Trees. Use of the Existing MRF Decision Tree, informed by the results of the optimization model presented in this section, and the CIF or other leadership efforts, will allow these locations to navigate through their unique transition planning process – ending up either as Hub MRF, transfer station conversion or stranded asset outcomes.

As shown in the detailed steps included in these Decision Trees, the timing of each of these individual transition planning processes will need to be coordinated with key stages in the Hub MRF development process such that commitments of tonnage can be made by way of letters of intent from transfer stations followed by long term intergovernmental agreements – all typically necessary for a "go" decision on the transition of the Hub MRF location into its potential new role in the optimized hub and spoke system. The tipping fee price points shown in the optimization model results for the Southwestern Region are key decision factors that will strongly influence both Hub MRF and Transfer Station development and their potential to find a win/win agreement needed for supporting the Hub MRF or MRFs in their new role.

Direct Haul Supply Development

The Direct Haul communities are a key for each transfer station and its development path, and thus the development path for each potential Hub MRF. Their supply commitment will be critical to this sequence of facility development. Again, coordination of these process steps with reference to Table 8 is key to the success of this process.

4.2.3. Key Drivers, Timing and Phasing

The WDO has compiled data on contract start and end dates and currently is verifying the data reported by the municipalities. This will be an important tool for the planning and phasing of the transition.

According to information available to the Project team, contracts come due for 5 municipalities in the southwestern region in 2013 and another 6 come due in 2014, mainly collection/depot and transfer contracts, but includes the processing operating contracts for Hamilton and Halton. The new Waste Management Inc. single-stream facility near Cambridge also likely will influence the flow of material from the southwestern region.

Table 8: Direct Haul Lookup Table

Program	Direct Haul Facility Type	Region	Hub MRF	Multiple Regions	Baseline	Option 1	Option 1-So	Option 1-WA	Option 2	Option 3
Halton	TS/MRF	SW	Hamilton	C/SW	X	X		X		
	TS/MRF	SW	Waterloo	C/SW				X		
Stratford	TS	SW	Hamilton	No	X	X				
	TS	SW	London	No		X				
	TS	SW	Waterloo	No				X	X	X
Essex-Windsor Solid Waste Authority	TS	SW	Southfield, MI	No			X			
	TS	SW	London	No	X					
	TS	SW	Waterloo	No				X		
	MRF	SW	Windsor	No		X			X	X
Wellington	TS	SW	Hamilton	C/SW	X	X				
	MRF	SW	Waterloo	C/SW				X	X	X
Norfolk County	TS	SW	Hamilton	No	X	X		X	X	X
Guelph	TS	SW	Hamilton	No	X	X				
	MRF	SW	Waterloo	No				X	X	X
North Huron	TS	SW	Hamilton	No	X					
	MRF	SW	Waterloo	No				X	X	X
	MRF	SW	London	No		X				
Owen Sound	TS	SW	Waterloo	C/SW				X	X	X
London	MRF	SW	London	No	X	X			X	X
	MRF	SW	Waterloo	No				X		
Waterloo	MRF	SW	Waterloo	No				X	X	X
	TS	SW	Hamilton	No	X	X				
Ashfield-Colborne-	TS	SW	Hamilton	No	X					

Program	Direct Haul Facility Type	Region	Hub MRF	Multiple Regions	Baseline	Option 1	Option 1-So	Option 1-WA	Option 2	Option 3
Wawanosh	TS	SW	London	No		X				
	TS	SW	Waterloo	No				X	X	X
Sarnia	TS	SW	Windsor	No				X		
	TS	SW	Waterloo	No						
	TS	SW	London	No	X	X	X		X	X
Howick	TS	SW	Hamilton	No	X					
	MRF	SW	Waterloo	No				X	X	X
	MRF	SW	Hamilton/London	No		X				
Chatsworth	TS	SW	Waterloo	C/SW				X	X	X
Hanover	TS	SW	Hamilton	No	X	X				
	TS	SW	Waterloo	No				X	X	X
Thames Centre	TS	SW	Hamilton	No	X					
	TS	SW	Waterloo	No		X				
	MRF	SW	London	No				X	X	X
Hamilton	MRF/TS	SW	Hamilton	No	X	X		X	X	X
Brantford	MRF/TS	SW	Hamilton	No	X	X		X	X	X
	MRF	SW	Waterloo	No				X	X	X
Bluewater Recycling Association	TS	SW	Hamilton	No	X					
	MRF	SW	Waterloo	No				X	X	X
	MRF/TS	SW	Windsor	No		X				
	MRF/TS	SW	London	No	X				X	X
Bruce Area Solid Waste Recycling	TS	SW	Hamilton	C/SW	X	X				
	TS	SW	Waterloo	C/SW				X	X	X
West Elgin	TS	SW	Windsor	No		X		X	X	X

Program	Direct Haul Facility Type	Region	Hub MRF	Multiple Regions	Baseline	Option 1	Option 1-So	Option 1-WA	Option 2	Option 3
	MRF/TS	SW	London	No	X	X	X		X	X
	MRF/TS	SW	Waterloo	No				X		
Melancthon	TS	SW	Waterloo	C/SW				X	X	X
Georgian Bluffs	TS	SW	Waterloo	C/SW				X	X	X
Meaford	TS	SW	Waterloo	C/SW				X	X	X
Central Elgin	TS	SW	Waterloo	No				X		
	TS	SW	Hamilton	No	X					
	MRF	SW	London	No		X			X	X
St. Thomas	TS	SW	Hamilton	No	X					
	TS	SW	London	No		X		X	X	X
St. Clair	TS	SW	Windsor	No				X		
	TS	SW	Waterloo	No						
	TS	SW	London	No	X	X	X		X	X
Southwold	TS	SW	Waterloo	No				X		
	MRF	SW	London	No		X			X	X
Niagara	TS	SW	Hamilton	No	X	X		X	X	
	MRF	SW	Niagara	No						X
Bayham	TS	SW	Hamilton	No	X	X		X	X	X
	TS	SW	Waterloo	No				X		
	MRF	SW	Hamilton	No	X	X			X	X
Dutton/Dunwich	TS	SW	Hamilton	No	X					
	TS	SW	Waterloo	No				X		
	TS	SW	London	No		X			X	X
Northern Bruce	TS	SW	Waterloo	C/SW				X	X	X
Aylmer	TS	SW	Hamilton	No	X					

Program	Direct Haul Facility Type	Region	Hub MRF	Multiple Regions	Baseline	Option 1	Option 1-So	Option 1-WA	Option 2	Option 3
	TS	SW	Waterloo	No				X		
	MRF	SW	London	No		X			X	X
Chatham-Kent	TS	SW	Windsor	No		X		X	X	X
	TS	SW	London	No	X	X	X		X	X
Plympton-Wyoming	TS	SW	Windsor	No				X		
	TS	SW	Waterloo	No						
	TS	SW	London	No	X	X	X		X	X
Malahide	TS	SW	Hamilton	No	X					
	TS	SW	Waterloo	No				X		
	MRF	SW	London	No		X			X	X
Brant	TS	SW	Hamilton	No	X	X		X	X	X
Enniskillen	TS	SW	Windsor	No				X		
	TS	SW	Waterloo	No						
	TS	SW	London	No	X	X	X		X	X
Grey Highlands	TS	SW	Waterloo	C/SW				X	X	X
Southwest Middlesex, Municipality of	MRF/TS	SW	Windsor	No		X		X	X	X
	TS	SW	Waterloo	No				X		
	TS	SW	London	No	X	X	X		X	X
West Grey	TS	SW	Hamilton	No	X	X				
	TS	SW	Waterloo	No				X	X	X
Southgate	TS	SW	Waterloo	C/SW				X	X	X
	TS	SW	London	C/SW		X				
Chippewas of Kettle and Stony Point	TS	SW	Windsor	No				X		
	TS	SW	Waterloo	No						
	TS	SW	London	No	X	X	X		X	X

Program	Direct Haul Facility Type	Region	Hub MRF	Multiple Regions	Baseline	Option 1	Option 1-So	Option 1-WA	Option 2	Option 3
Petrolia	TS	SW	Windsor	No				X		
	TS	SW	Waterloo	No						
	TS	SW	London	No	X	X	X		X	X
Mississaugas of the New Credit First Nation	TS	SW	Hamilton	No	X	X		X	X	X
Haldimand County	MRF/TS	SW	Hamilton	No	X	X		X	X	X
	MRF	SW	Niagara	No				X		X
Oxford, County of	TS	SW	Hamilton	No	X	X		X	X	X
	MRF	SW	London	No		X			X	X
	TS	SW	Waterloo	No				X		
	MRF	SW	Waterloo	No				X	X	X
Chippewas of Nawash First Nation	TS	SW	Waterloo	C/SW				X	X	X
Walpole Island First Nation	TS	SW	Windsor	No				X		
	TS	SW	Waterloo	No						
	TS	SW	London	No	X	X	X		X	X