



## Volume 5: Central Ontario & GTA

# A Study of the Optimization of the Blue Box Material Processing System in Ontario *Final Report*

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Prepared for Waste Diversion Ontario by:



**Resource Recycling Systems**  
*Sustainable Systems for a Waste-Free Future*

**STEWARDEDGE**

# Volume 5: Central Ontario & GTA

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# Volume 5: Central Ontario & GTA

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## 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 shown with:

- Maps showing the Baseline Greenfield System and options showing:
  - The 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 regional 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. Central Region Options

The Central region includes the City of Toronto, Peel, York and Durham Regions and reaches Simcoe, the less populated areas to the east of Quinte and the Kawarthas and north to the Muskokas, Parry Sound and Bruce Area. The current system has 17 MRFs (11 public and 6 private). A large percentage of the material is transferred in the Central region, mainly due to the transfer operations in Toronto and York Region. There are also several privately operated transfer operations outside of the GTA. There are 14 public and private transfer stations of which 8 are public (6 in Toronto) and 6 are private. Six of the MRFs have the capacity to process greater than 50,000 tonnes per year, four of which are publically

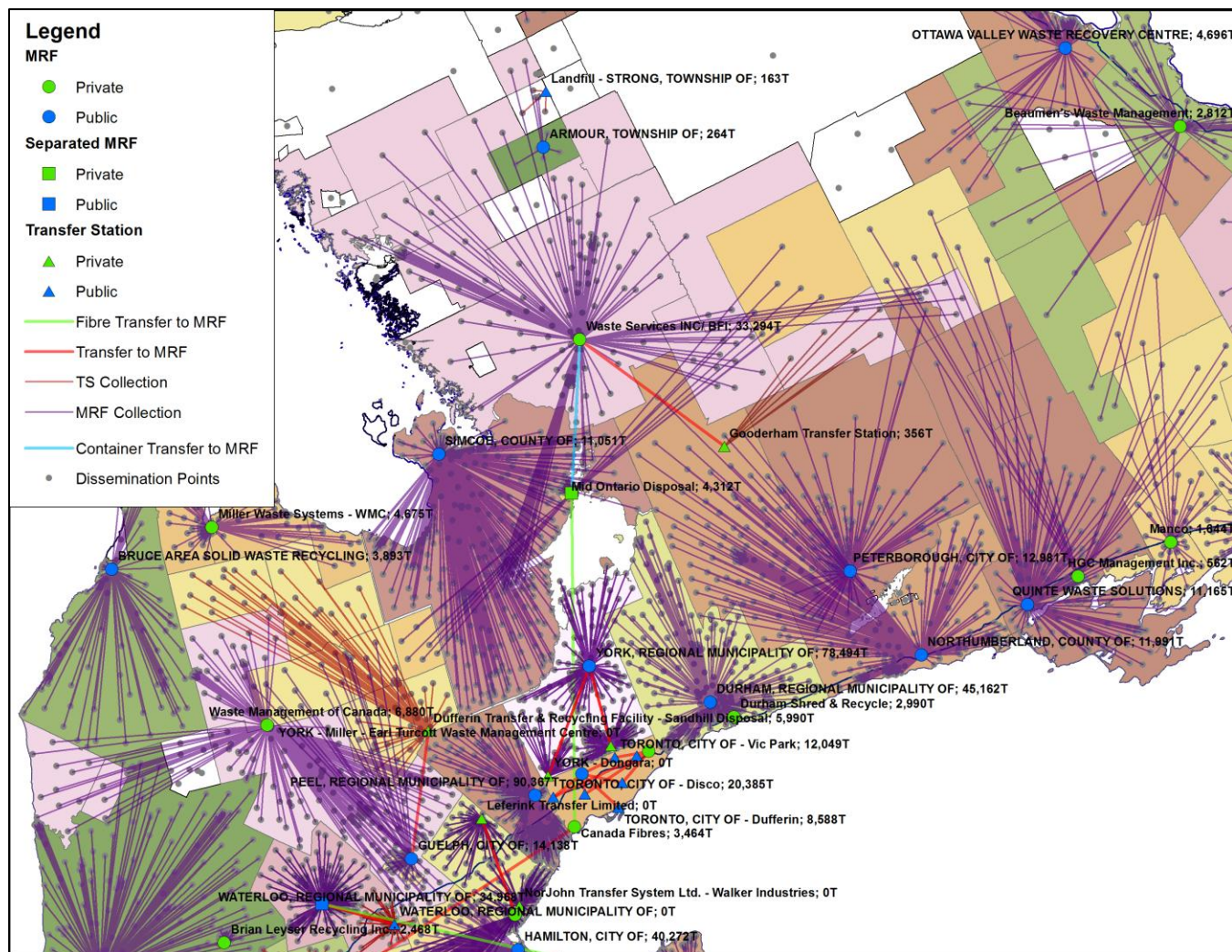
owned. With the exception of the Waste Services MRF in Bracebridge, all of the other MRFs process less than about 15,000 tpy with 5 processing less than 5,000 tpy of Blue Box material.

### 3.1. Summary of Options

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

- Baseline: 3 MRFs; 1 near Peel, 1 in Toronto East, and 1 in Toronto West; All City of Toronto Transfer Stations are utilized. (Natural Growth Recovery)
- Option 1: 4 MRFs; 1 near Durham, 1 near Peel and 2 in Toronto (1 in the West and 1 in the East); All City of Toronto Transfer Stations are utilized. (Natural Growth Recovery)
- Option 1-Ba: 4 MRFs; 1 in Barrie, 1 near Peel and 2 in Toronto (1 in the West and 1 in the East), i.e. Option 1 using a MRF in Barrie instead of Durham; All City of Toronto Transfer Stations are utilized. (Natural Growth Recovery)
- Option 2: 5 MRFs; 1 near Durham, 1 near Barrie, 1 near Peel and 2 in Toronto (1 in the West and 1 in the East); All City of Toronto Transfer Stations are utilized. (Natural Growth Recovery)
- Variation A on the Baseline: Existing MRFs in Southampton, Durham, Peterborough, Trenton, and East Gwillimbury are utilized as transfer stations; All City of Toronto Transfer Stations are utilized; Existing MRF in Peel utilized as a MRF.
- Variation B on the Baseline: Existing MRFs in Counties of Northumberland Simcoe are used as transfer stations and all City of Toronto Transfer Stations are utilized; These in addition to those used in Variation A on the Baseline.
- Variation C on the Baseline: All remaining MRFs and transfer stations (except those determined to not fit our criteria) are utilized as transfer stations (see Table 8 for full listing).
- Variation A on the Option 1: Existing MRFs in Kingston, Southampton, Durham, Peterborough, Trenton, and East Gwillimbury are utilized as transfer stations; All City of Toronto Transfer Stations are utilized; Existing MRFs in Peel and Durham are utilized as a MRFs.
- Variation B on the Option 1: Existing MRFs in Counties of Northumberland and Simcoe used as transfer stations and all City of Toronto Transfer Stations are utilized. These in addition to those used in Variation A on the Baseline.
- Variation C on the Option 1: All remaining MRFs and transfer stations (except those determined to not fit our criteria) are utilized as transfer stations (see Table 8 for full listing).
- High Recovery Baseline: Same as Baseline above but using the High Recovery tonnes
- High Recovery Option 1, 1-Ba, 2: Same as Options 1, 1-Ba, 2 above but using the High Recovery tonnes.
- Variation C on the High Recovery Baseline: Same as Variation C on the Baseline above but using the High Recovery tonnes.

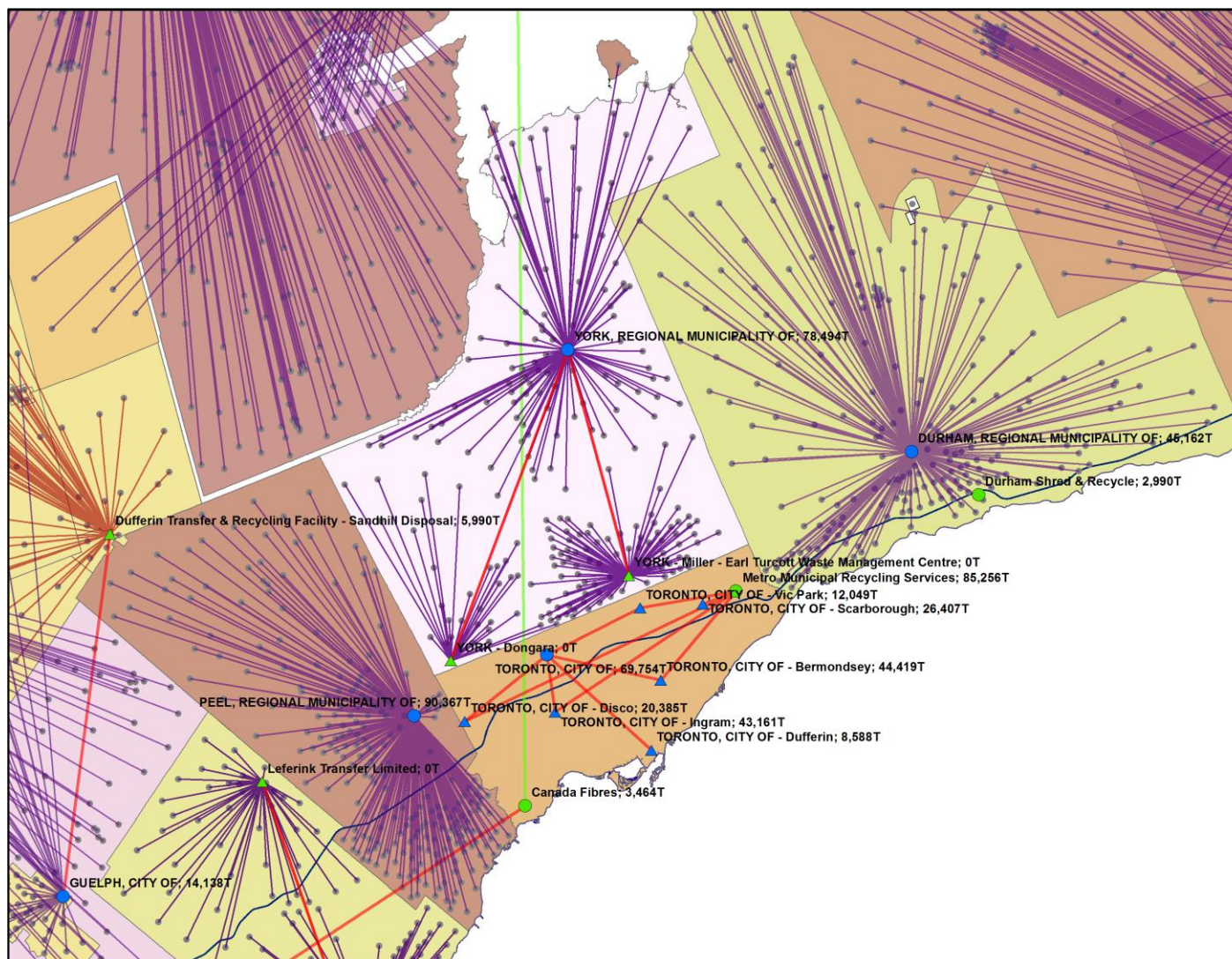
**Figure 1: Existing System**



*Note: Not all labels shown in the GTA area; please see the following GTA map for full details.*



**Figure 2: Existing System for the GTA**



**Table 1: Central Region Summary**

	Baseline	Option 1: 4 MRFs	Option 1-Ba: 4 MRFs	Option 2: 5 MRFs
<b>Wasteshed Tonnes</b>	574,300	588,600	574,300	588,600
<b># of TS</b>	15	15	14	14
<b># of MRFs</b>	3	4	4	5
<b># of Current MRFs-&gt; TS</b>	0	0	0	0
<b># of Current TS Upgrades</b>	0	0	0	0
<b># of public MRFs shutdown or repurposed</b>	10	11	10	11
<b># of public TS shutdown or repurposed</b>	2	2	2	2
<b>Total Capital Investment</b>	\$117,907,200	\$135,517,500	\$115,171,600	\$132,781,900
<b>Total Annual Operating Cost</b>	\$55,205,000	\$58,740,900	\$ 56,511,300	\$60,047,200
<b>Average Annual Operating/Tonnes</b>	\$96.13	\$99.79	\$98.41	\$102.01
<b>Relative Effect on Direct Haul % Diff. from Baseline</b>	-	2.9%	0.0%	2.9%

Note:

- 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.

**Table 2: Central Region Summary of Variations**

	Baseline A	Baseline B	Baseline C	Option 1A	Option 1B	Option 1C
<b>Wasteshed Tonnes</b>	574,300	574,300	574,300	588,600	588,600	588,600
<b># of TS</b>	16	18	24	16	18	23
<b># of MRFs</b>	3	3	3	4	4	4
<b># of Current MRFs-&gt; TS</b>	5	7	9	5	7	10
<b># of Current TS Upgrades</b>	0	0	6	0	0	6
<b># of public MRFs shutdown or repurposed</b>	4	3	2	5	4	2
<b># of public TS shutdown or repurposed</b>	2	2	1	2	2	1
<b>Total Capital Investment</b>	\$89,348,800	\$90,238,800	\$91,976,800	\$90,390,000	\$91,288,700	\$92,479,900
<b>Total Annual Operating Cost</b>	\$56,464,800	\$56,750,400	\$58,084,900	\$59,025,900	\$59,319,500	\$60,665,800
<b>Average Annual Operating/Tonnes</b>	\$98.33	\$98.82	\$ 101.15	\$ 100.28	\$ 100.78	\$ 103.06
<b>Relative Effect on Direct Haul % Diff. from Baseline</b>	-6.2%	-8.9%	-18.5%	-3.7%	-6.4%	-16.6%

### 3.1.1. Central Region Capital Cost Summary

**Table 3: Capital Cost Summary**

Capital Summary	Baseline	Option 1	Option 1-Ba	Option 2
<b>Total capital in system</b>	\$117,907,200	\$135,517,500	\$115,171,600	\$132,781,900
<b>Total capital for new MRFs</b>	\$102,092,200	\$119,702,500	\$101,446,600	\$119,056,900
<b>Total capital for new TS</b>	\$15,815,000	\$15,815,000	\$13,725,000	\$13,725,000

- In the baseline, it is assumed that a new large+ MRF is built to handle the 253,655 tonnes of capacity needed at Peel, along with a new large MRF to handle 183,845 tonnes of capacity needed at the other Toronto MRF, and a new large MRF to handle 136,763 tonnes of capacity near Peel.

- In Option 1, it is assumed that a new large+ MRF is built to handle the 253,655 tonnes of capacity needed at one Toronto MRF, along with a new large MRF to handle 110,909 tonnes of capacity needed at the other Toronto MRF, a new large MRF to handle 136,763 tonnes of capacity near Peel, and a new medium MRF to handle 87,293 tonnes of capacity in Durham.
- In Option 1-Ba, it is assumed that a new large+ MRF is built to handle the 253,655 tonnes of capacity needed at one Toronto MRF, along with a new large MRF to handle 183,845 tonnes of capacity needed at the other Toronto MRF, a new medium MRF to handle 81,957 tonnes of capacity near Peel, and a new intermediate MRF to handle 54,806 tonnes of capacity in Barrie.
- In Option 2, it is assumed that a new large+ MRF is built to handle the 253,655 tonnes of capacity needed at one Toronto MRF, along with a new large MRF to handle 110,909 tonnes of capacity needed at the other Toronto MRF, a new medium MRF to handle 81,957 tonnes of capacity near Peel, a new medium MRF to handle 87,293 tonnes of capacity in Durham and a new intermediate MRF to handle 54,806 tonnes of capacity in Barrie.

**Table 4: Summary of Capital Costs on Variations for the Baseline**

	Baseline A	Baseline B	Baseline C
<b>Total capital for new MRFs</b>	\$79,328,800	\$79,328,800	\$79,576,800
<b>Total capital for upgrades to Existing MRFs</b>	\$7,300,000	\$7,300,000	\$7,300,000
<b>Total capital for new TS</b>	\$6,455,000	\$6,455,000	\$3,365,000
<b>Total capital for conversions from MRF to TS &amp; upgrades to existing TS</b>	\$ 3,565,000	\$4,455,000	\$9,035,000
<b>Total Capital</b>	\$89,348,800	\$90,238,800	\$91,976,800

- In all three variations on the baseline, a large+ MRF in Toronto along with a large MRF in Toronto are assumed to be built. The Peel MRF would be upgraded to our Medium MRF equipment setup. All City of Toronto Transfer Stations are utilized.
- In variation A on the baseline, MRFs in Southampton, Durham, Peterborough, Trenton, and East Gwillimbury are utilized as transfer stations. One new small transfer station, two new medium transfer stations and two large transfer stations are built as well.
- In variation B on the baseline, additional MRFs in the Counties of Northumberland and Simcoe are converted to transfer stations. Five new large transfer stations are built as well.
- In variation C on the baseline, 13 total existing facilities are upgraded (4 medium and 9 large) with three new transfer stations built (one small, one medium and one large).

**Table 5: Summary of Capital Costs on Variations for the Options**

	Option 1 A	Option 1 B	Option 1 C
<b>Total capital for new MRFs</b>	\$65,270,000	\$65,278,700	\$64,534,900
<b>Total capital for upgrades to Existing MRFs</b>	\$15,100,000	\$15,100,000	\$15,100,000
<b>Total capital for new TS</b>	\$6,455,000	\$6,455,000	\$3,365,000
<b>Total capital for conversions from MRF to TS &amp; upgrades to existing TS</b>	\$3,565,000	\$4,455,000	\$9,480,000



<b>Total Capital</b>	\$90,390,000	\$91,288,700	\$92,479,900
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- In all three variations on Option 1, two large MRFs in Toronto are assumed to be built. The Peel MRF and Durham MRF would both be upgraded to our Medium MRF equipment setup. All City of Toronto Transfer Stations are utilized.
- In variation A on Option 1, existing MRFs in Kingston, Southampton, Durham, Peterborough, Trenton, and East Gwillimbury are utilized as transfer stations. One new small transfer station, one new medium transfer station and three large transfer stations are built as well.
- In variation B on Option 1, additional MRFs in the Counties of Northumberland and Simcoe are converted to transfer stations. One new small transfer station, one new medium transfer station and three large transfer stations are built as well.
- In variation C on Option 1, 13 total existing facilities are upgraded (1 small, 6 medium and 6 large) with five new large transfer stations built.

### **Peel MRF Upgrade**

The Peel MRF is currently a single stream facility with the capacity to handle up to 130,000 Tpy. The building is sufficient for our Medium MRF. However, in order to reduce the labour used in the process, an almost full new set of equipment will need to be installed. We estimate that most bunkers and bins, along with the balers could be repurposed in the upgraded facility. Space would need to be made for the additional screens and optical sorters. This could potentially be accomplished by removing the glass bunkers and glass sort line. We estimate that new equipment, installed, would be about \$2 million less than our medium MRF for a total upgrade cost of \$7.3 million.

### **Durham MRF Upgrade**

The Durham MRF is currently a dual stream facility that is mostly manual sort. The building is sufficient for our large MRF. Similar to Peel, a nearly full set of new equipment would need to be installed to obtain the efficiencies of our Medium MRF. Likely, the bins and bunkers can be reused, but it is unclear if the baler is suitable for reuse. We estimate the conversion cost at \$1.5 million less than our Medium MRF equipment cost for a total upgrade cost of \$7.8 million.

## **3.2. Detailed Description of Each Option**

### **3.2.1. Baseline**

The Baseline for the Central Region (see Figure 3 and Figure 4) contains 3 MRFs (one in Peel and two in Toronto on the West and East sides), 15 Transfer stations (All City of Toronto Transfer Stations are utilized) and handles 574,300 tonnes per year. The model indicates a total operating cost of \$55,205,000 per year giving an average operating cost of \$96.13 per tonne. All facilities are new resulting in a \$89,348,800 total capital cost and shutdown or repurposing of 10 Public MRFs and 2 Public transfer stations. Table 1 compares this scenario to others for the region.

In comparison, the Baseline under the High Growth for the Central Region (see Figure 5 and Figure 6) contains 3 MRF, 15 transfer stations and handles 610,888 tonnes per year at a total gross operating cost of \$58,598,400 per year and an average operating cost of \$95.92 per tonne. Similar to the Natural

Growth Scenario, all facilities are new resulting in a \$125,585,800 total capital cost and shutdown or repurposing of 10 Public MRFs and 2 Public TSs. Table 6 compares this scenario to others for the region.



**Table 6: Baseline under High Growth**

	High Baseline	High Option 1	High Option 1-Ba	High Option 2	High Baseline C
<b>Wasteshed Tonnes</b>	610,900	627,200	610,900	627,200	610,900
<b># of TS</b>	15	15	14	14	24
<b># of MRFs</b>	3	4	4	5	3
<b># of Current MRFs-&gt; TS</b>	0	0	0	0	9
<b># of Current TS Upgrades</b>	0	0	0	0	6
<b># of public MRFs shutdown or repurposed</b>	10	11	10	11	2
<b># of public TS shutdown or repurposed</b>	2	2	2	2	1
<b>Total Capital Investment</b>	\$125,585,800	\$143,196,207	\$122,850,200	\$140,460,600	\$97,355,500
<b>Total Annual Operating Cost</b>	\$58,598,400	\$62,212,300	\$59,768,500	\$63,382,400	\$61,557,000
<b>Average Annual Operating/Tonnes</b>	\$95.92	\$99.18	\$97.84	\$101.05	\$100.77
<b>Relative Effect on Direct Haul % Diff. from Baseline</b>	5.7%	8.4%	5.7%	8.4%	-14.3%

### 3.2.2. Option 1

Option 1 for the Central Region (see Figure 7 and Figure 8) contains 4 MRFs (one near Durham, one in Peel and two in Toronto), 15 Transfer stations (All City of Toronto Transfer Stations are utilized) and handles 588,600 tonnes per year due to picking up the Kingston-area sub-region since a MRF in the Durham area sits closer. The model indicates a total operating cost of \$58,740,000 per year giving an average operating cost of \$99.79 per tonne. All facilities are new resulting in a \$135,517,500 total capital cost and shutdown or repurposing of 11 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 2.9% higher than the Baseline due to the Kingston-area addition. Table 1 compares this scenario to others for the region.

### 3.2.3. Option 1-Ba

Option 1-Ba for the Central Region (see Figure 9 and Figure 10) contains 4 MRFs (one near Barrie, one in Peel and two in Toronto), 14 Transfer stations (All City of Toronto Transfer Stations are utilized) and handles 574,300 tonnes per year. The model indicates a total operating cost of \$56,511,300 per year giving an average operating cost of \$98.41 per tonne. All facilities are new resulting in a \$115,171,600 total capital cost and shutdown or repurposing of 10 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 2

Option 2 for the Central Region (see Figure 11 and Figure 12) contains 5 MRFs (one near Durham, one in Barrie, one in Peel and 2 in Toronto), 14 Transfer stations (All City of Toronto Transfer Stations are utilized) and handles 588,600 tonnes per year. There are more tonnes handled than in the Baseline because Option 2 attracts material from the Kingston area in the Eastern Region since a MRF near Durham is closer than Barrie and Ottawa. The model indicates a total operating cost of \$60,047,200 per year giving an average operating cost of \$102.01 per tonne. All facilities are new resulting in a \$132,781,900 total capital cost and shutdown or repurposing of 11 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 2.9% higher due to the additional material in the Kingston area. Table 1 compares this scenario to others for the region.

### 3.2.5. Central Region Effects on the Eastern Region

Options that include a MRF in the Durham area (Option 1, Option 2, Option 1A, Option 1B, Option 1C) attract material from the Kingston area and away from the Eastern Region. This increases the Central Region's tonnage from 574,300 to 588,600. The most direct comparison to understand the effect is between Option 1 and Option 1-Ba, since the difference between these is placement of a third MRF around either Durham or Barrie, respectively. Due to the more central location in the Central region, a facility near Barrie allows transfer distances to remain smaller. The facility near Barrie would handle 54,800 tonnes at \$105.07/tonne (\$5,758,400/year) and the facility near Durham would process 87,300 tonnes at \$90.49/tonne (\$7,898,900/year) in Option 1-Ba; or a 13.9% difference. Option 1 overall runs at \$99.79/tonne and Option 1-Ba at \$98.41/tonne; or a 1.4% difference due to the relatively small total tonnages handled by either Barrie or Durham.

In the Eastern Region, moving the material near Kingston to the Central Region lowers the overall operating cost per tonne from \$100.32/tonne to \$98.95/tonne; or a 1.36% difference.

The net effect on the Central and Eastern regions is +0.92% and the province-wide system is +0.58%.

### 3.2.6. Baseline A

Baseline A for the Central Region (see Figure 13 and Figure 14) contains 3 MRFs (utilizing the existing Peel MRF and two new in Toronto), 16 Transfer stations (MRFs in Southampton, Durham, Peterborough, Trenton, and East Gwillimbury are converted, plus all City of Toronto Transfer Stations are utilized) and handles 574,300 tonnes per year. The model indicates a total operating cost of \$56,464,800 per year giving an average operating cost of \$98.33 per tonne. Due to the placement of the existing facilities 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 5 existing facilities, a conversion investment replaces new build prices, therefore the model shows a \$89,348,800 total capital cost and shutdown or repurposing of only 4 Public MRFs and 2 Public transfer stations. Table 8 shows which current facilities would be utilized. Finally, there is a 6.2% decrease in the weighted time for direct haul from the end of collection routes or depot locations to aggregation points since the current system public facilities are more evenly distributed between population centers than the Greenfield Aggregation Points. Table 2 compares this scenario to others for the region.

### 3.2.7. Baseline B

Baseline B for the Central Region (see Figure 15 and Figure 16) contains 3 MRFs (utilizing the existing Peel MRF and two new in Toronto), 18 Transfer stations (MRFs in Counties of Northumberland and Simcoe as well as those in Baseline A are converted, plus all City of Toronto Transfer Stations are utilized) and handles 574,300 tonnes per year. The model indicates a total operating cost of \$56,750,400 per year giving an average operating cost of \$98.82 per tonne. This scenario uses all public facilities meeting minimum criteria; therefore, 2 more transfer stations are added to the operating budget. Since this scenario uses 7 existing facilities, a conversion investment replaces new build prices; therefore the model shows a \$90,238,825 total capital cost, higher than in Variation A because of a larger number of facilities. Table 8 shows which current facilities would be utilized. Finally, there is an 8.9% decrease in the weighted time for direct haul from the end of collection routes or depot locations to aggregation points since the current system public facilities are more evenly distributed between population centers than the Greenfield Aggregation Points. Table 2 compares this scenario to others for the region.

### 3.2.8. Baseline C

Baseline C for the Central Region (see Figure 17 and Figure 18) contains 3 MRFs (utilizing the existing Peel MRF and two new in Toronto), 24 Transfer stations (see Table 8), and handles 574,300 tonnes per year. The model indicates a total operating cost of \$58,084,900 per year giving an average operating cost of \$101.15 per tonne. This scenario uses all public and private facilities capable of handling the tonnages; therefore, 9 more transfer stations are added to the operating budget. Since this scenario uses 9 existing MRFs and 6 existing transfer stations, a conversion investment replaces new build prices, therefore the model shows a \$91,976,800 total capital cost. Table 8 shows which current facilities would be utilized. Finally, there is an 18.5% 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.

### 3.2.9. Option 1A

Option 1A for the Central Region (see Figure 19 and Figure 20) contains 4 MRFs (utilizing the existing Peel and Durham MRFs and two new in Toronto), 16 Transfer stations (MRFs in Southampton, Durham, Peterborough, Trenton, and East Gwillimbury are converted, plus all City of Toronto Transfer Stations are utilized), and handles 588,600 tonnes per year. The model indicates a total operating cost of \$59,025,900 per year giving an average operating cost of \$100.28 per tonne. Since this scenario uses 7 existing facilities, a conversion investment replaces new build prices but the number of MRFs increased, therefore the model shows a \$90,390,000 total capital cost and shutdown or repurposing of 5 Public MRFs and 2 Public transfer stations. Table 8 shows which current facilities would be utilized. Finally, there is a 3.7% decrease in the weighted time for direct haul from the end of collection routes or depot locations to aggregation points since the current system public facilities are more evenly distributed between population centers than the Greenfield Aggregation Points. Table 2 compares this scenario to others for the region.

### 3.2.10. Option 1B

Option 1B for the Central Region (see Figure 21 and Figure 22) contains 4 MRFs (utilizing the existing Peel and Durham MRFs and two new in Toronto), 18 Transfer stations (MRFs in Counties of

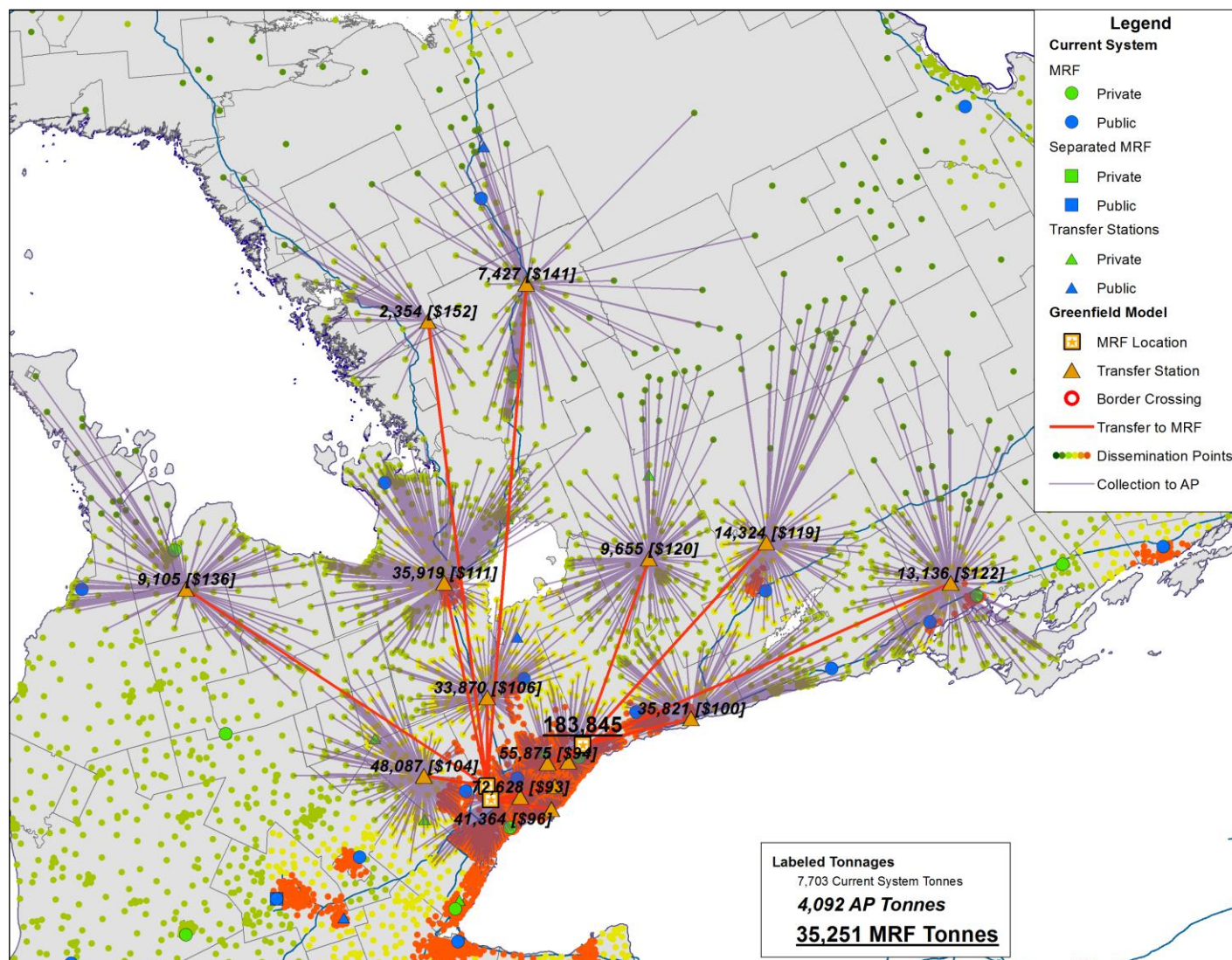
Northumberland and Simcoe as well as those in Baseline A are converted, plus all City of Toronto Transfer Stations are utilized), and handles 588,600 tonnes per year. The model indicates a total operating cost of \$59,319,500 per year giving an average operating cost of \$100.78 per tonne. This scenario uses public facilities that fit requirements for conversion; therefore, 2 more transfer stations are added to the operating budget. Since this scenario uses existing facilities, a conversion investment replaces new build prices, therefore the model shows a \$91,288,700 total capital cost, higher than Variation A because of the higher number of facilities. Table 8 shows which current facilities would be utilized. Finally, there is a 6.4% increase in the weighted time for direct haul from the end of collection routes or depot locations to aggregation points since the current system public facilities are more evenly between population centers than the Greenfield Aggregation Points. Table 2 compares this scenario to others for the region.

### **3.2.11. Option 1C**

Option 1C for the Central Region (see Figure 23 and Figure 24) contains 4 MRFs (utilizing the existing Peel and Durham MRFs and two new in Toronto), 23 Transfer stations (see Table 8) and handles 588,600 tonnes per year. The model indicates a total operating cost of \$60,665,800 per year giving an average operating cost of \$103.06 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 10 existing MRFs and 6 existing transfer stations, a conversion investment replaces new build prices; therefore the model shows a \$92,479,900 total capital cost. Table 8 shows which current facilities would be utilized. Finally, there is a 16.6% decrease in the weighted time for direct haul from the end of collection routes or depot locations to aggregation points since 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.



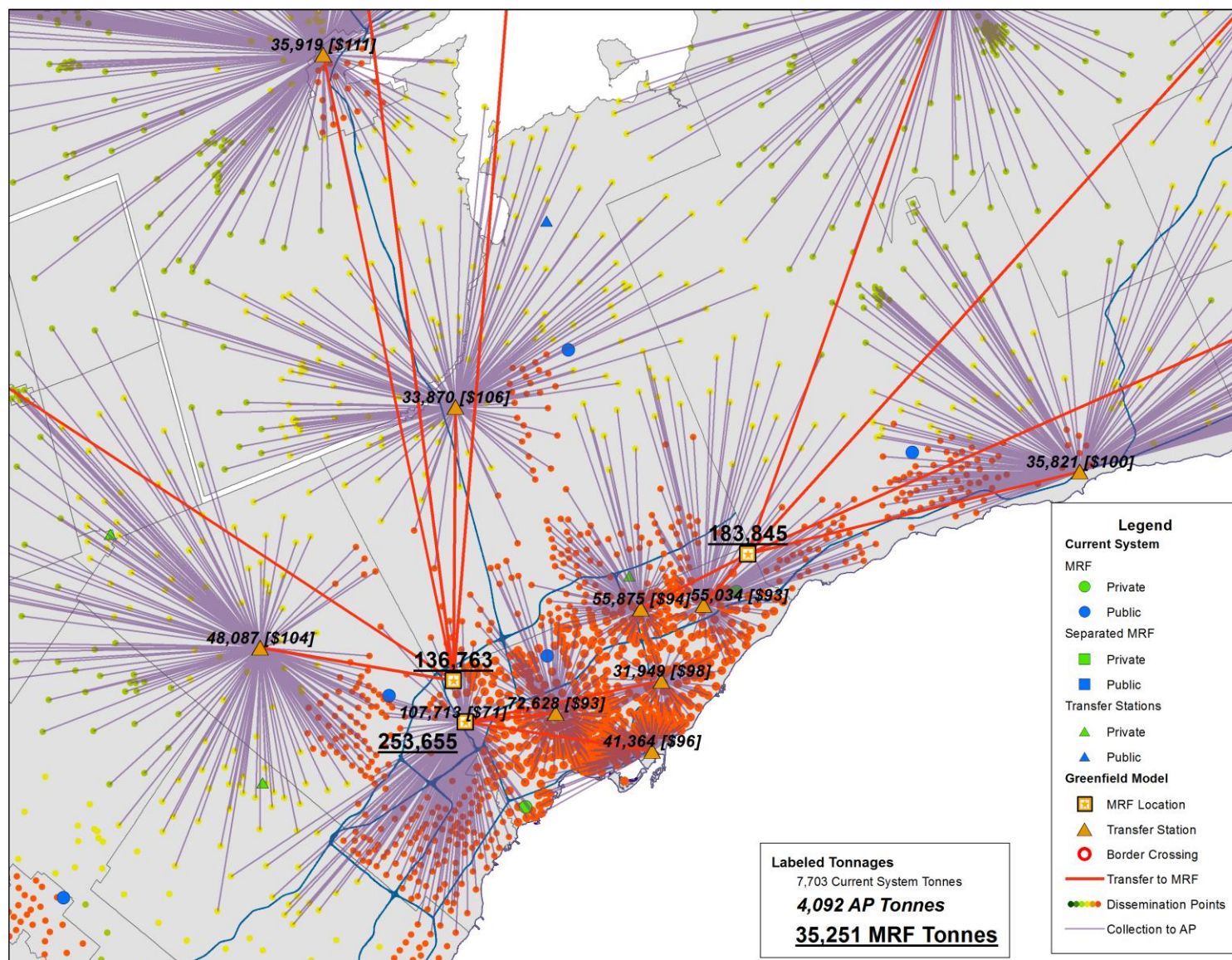
**Figure 3: Baseline for the Central Region**



*Note: Not all labels shown in the GTA area; please see the following GTA map for full details.*

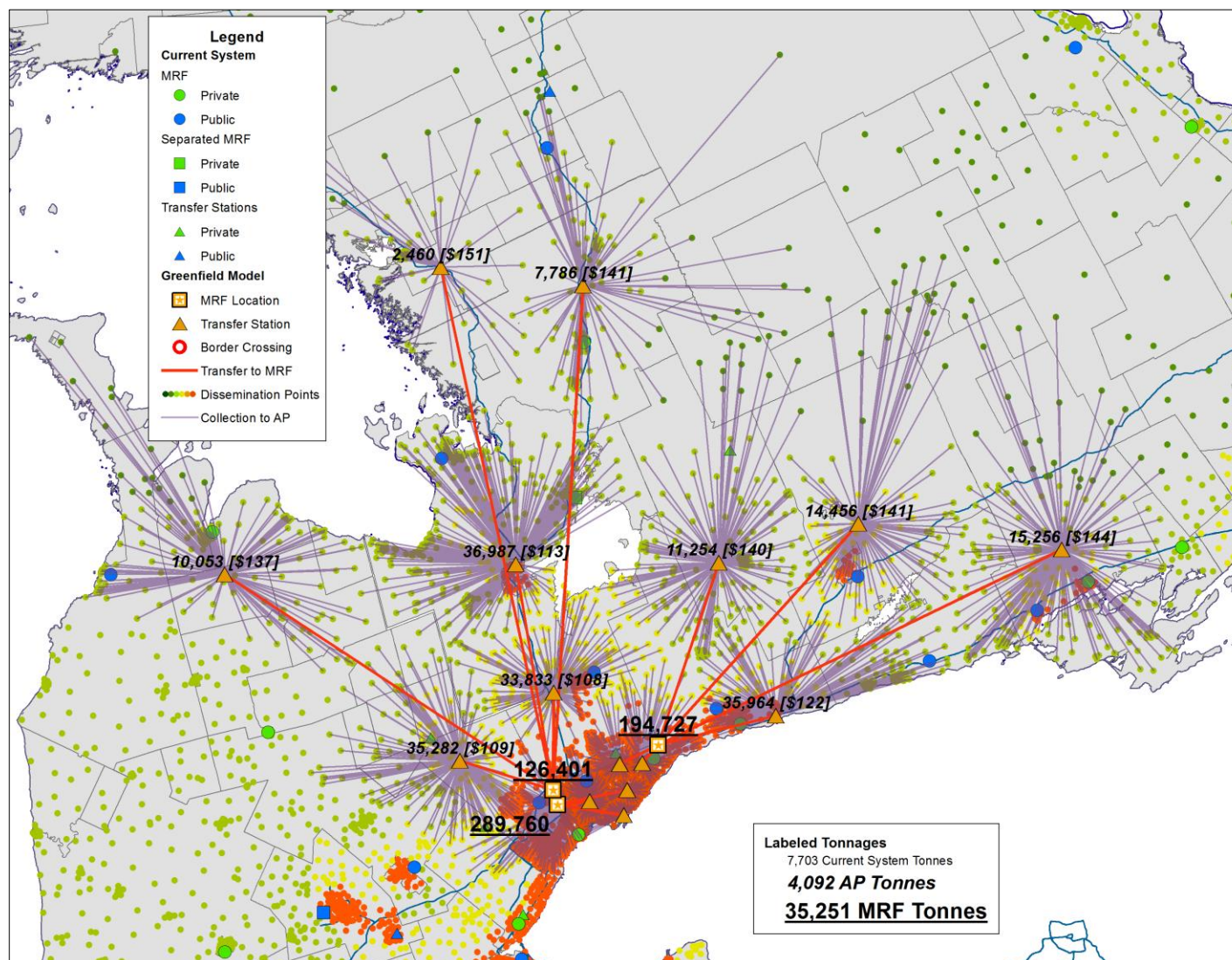


**Figure 4: Baseline of the GTA**





**Figure 5: Baseline under the High Recovery for the Central Region**



*Note: Not all labels shown in the GTA area; please see the following GTA map for full details.*



**Figure 6: Baseline under the High Recovery for the GTA**

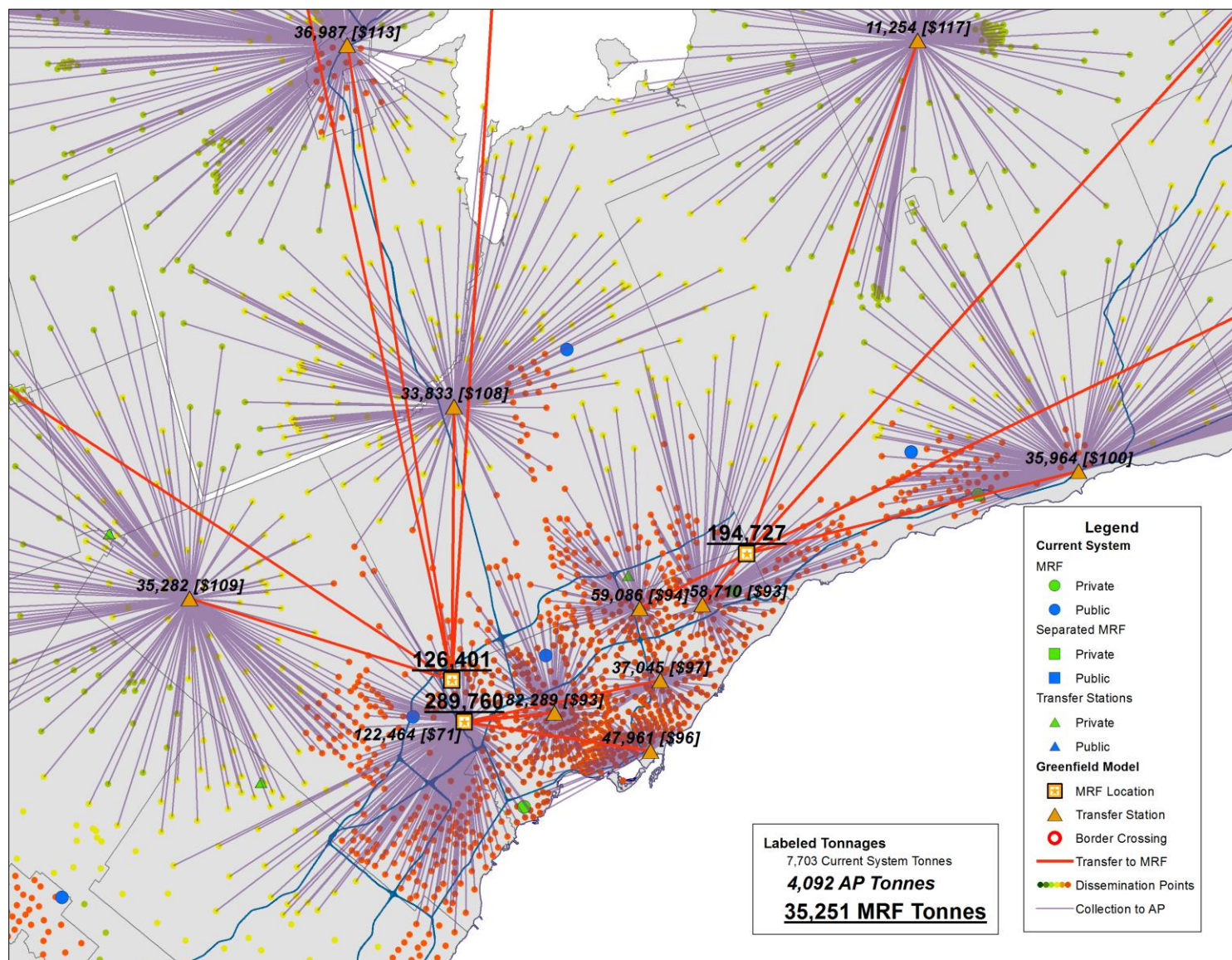
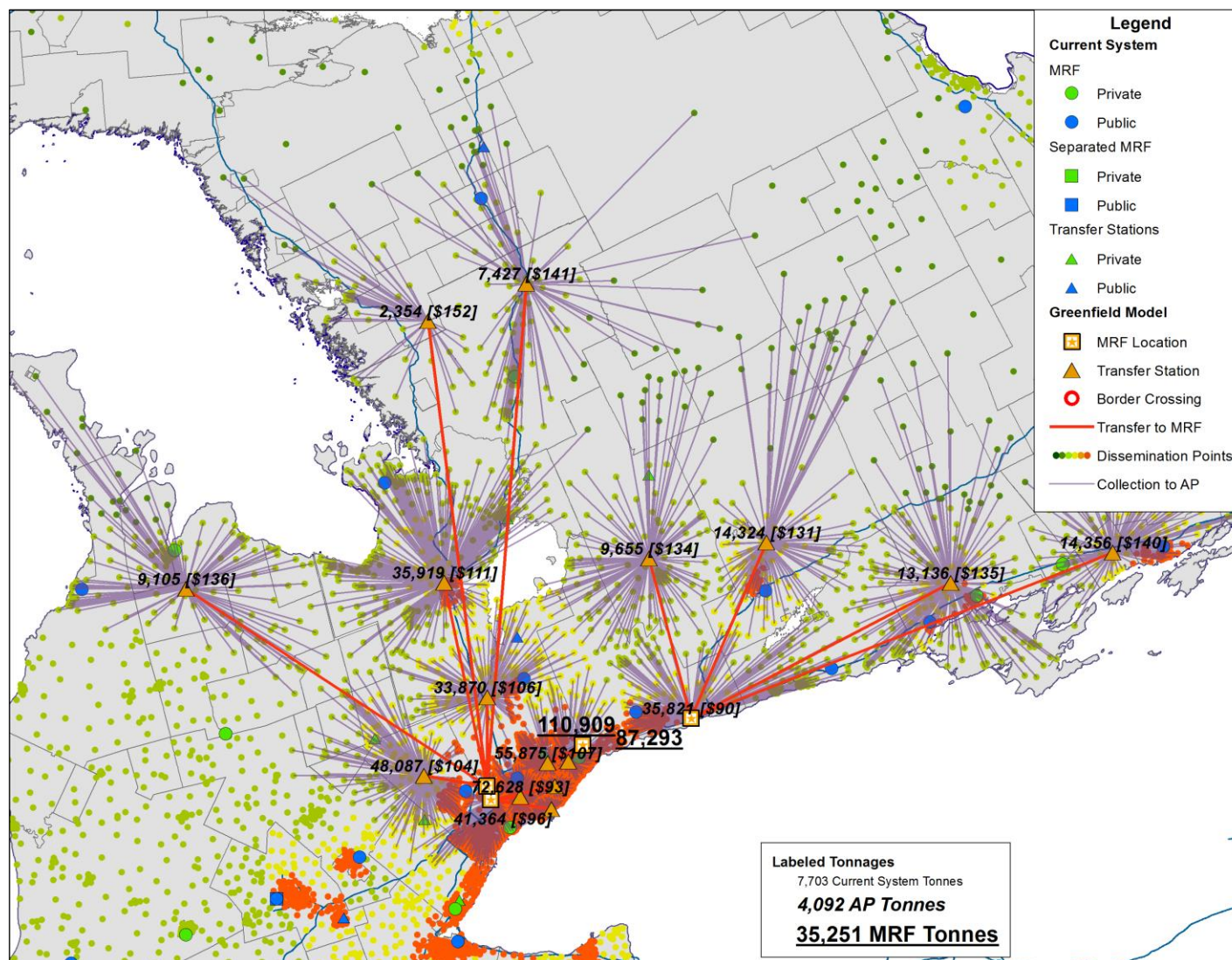




Figure 7: Option 1 for the Central Region



Note: Not all labels shown in the GTA area; please see the following GTA map for full details.



**Figure 8: Option 1 for the GTA**

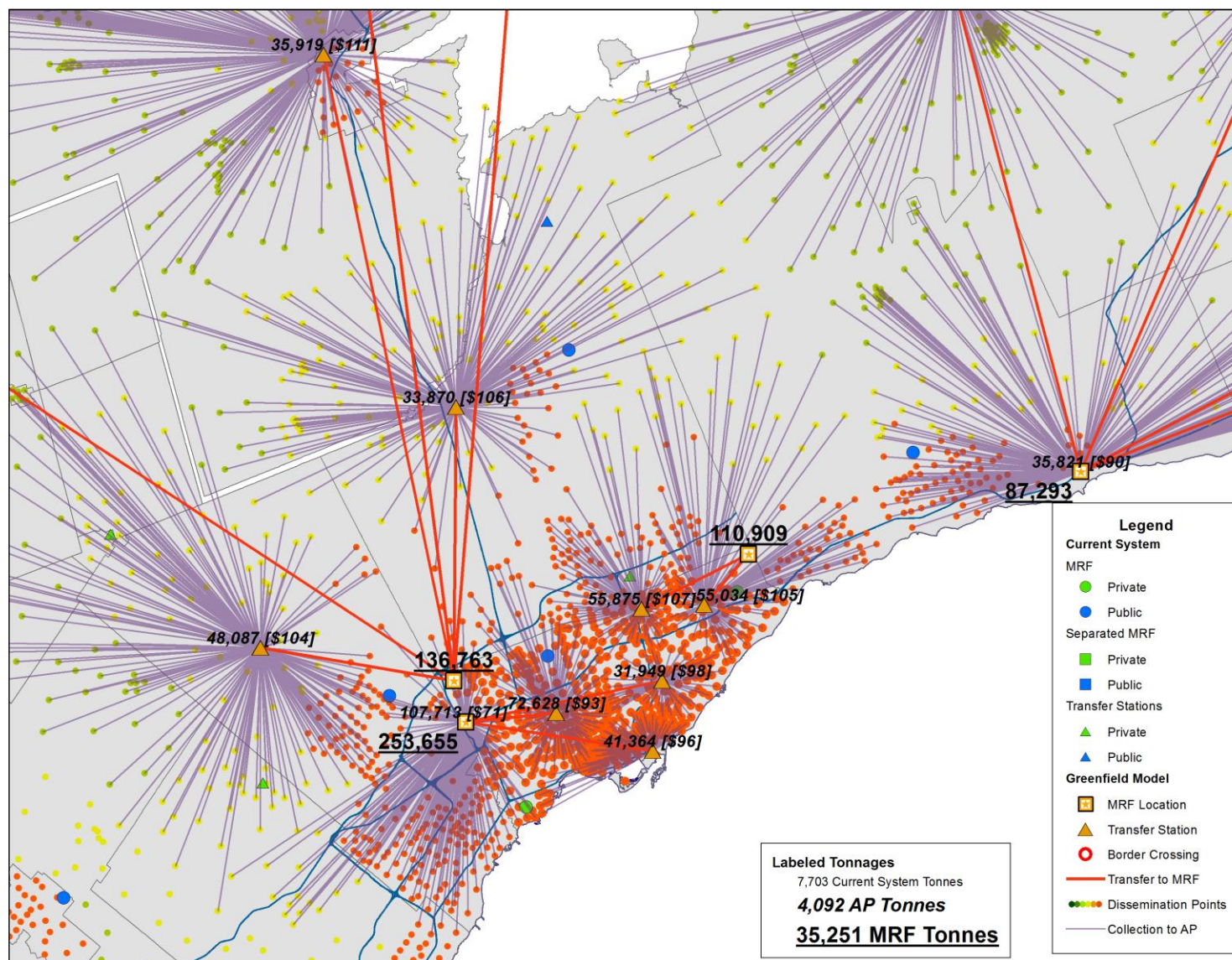
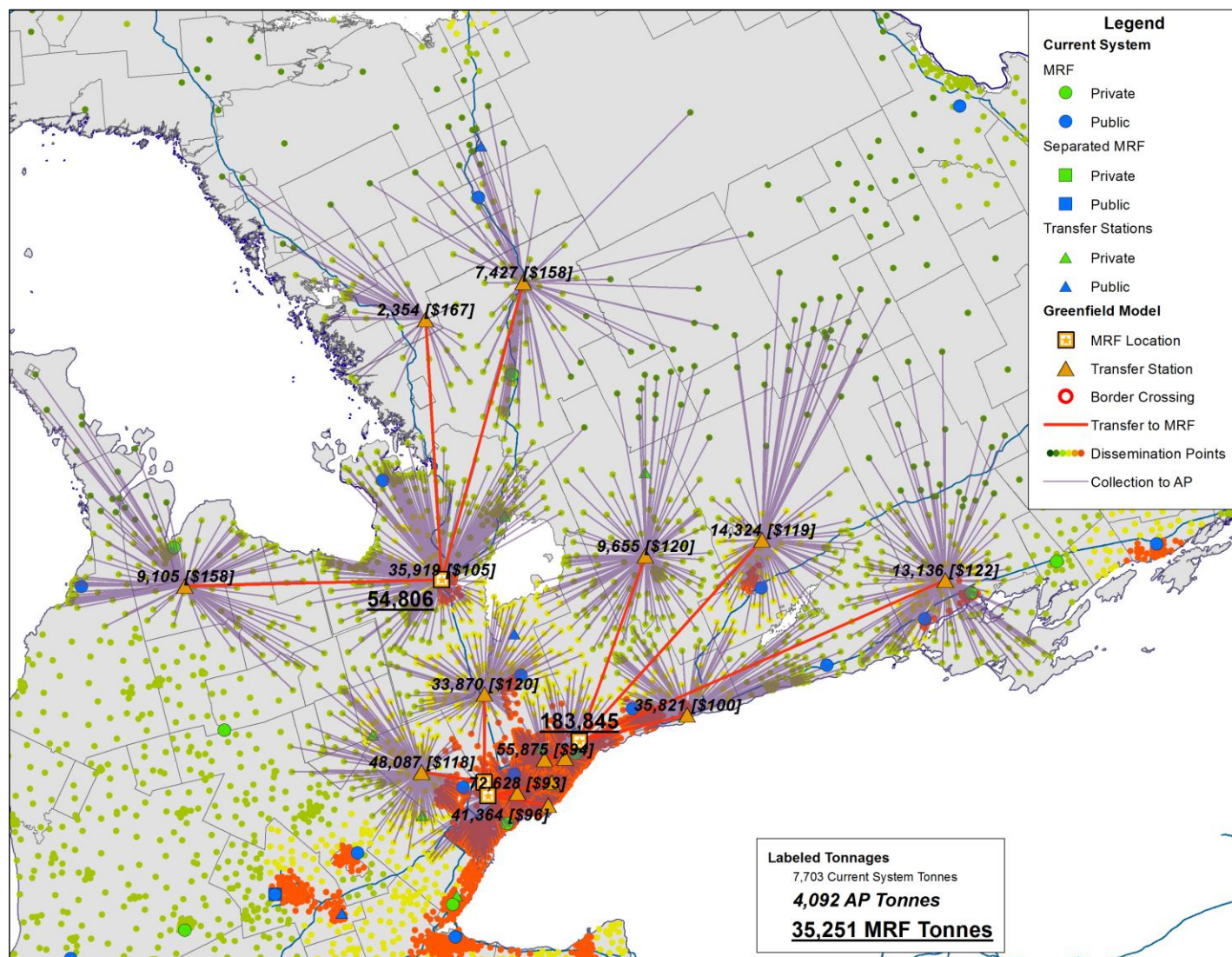




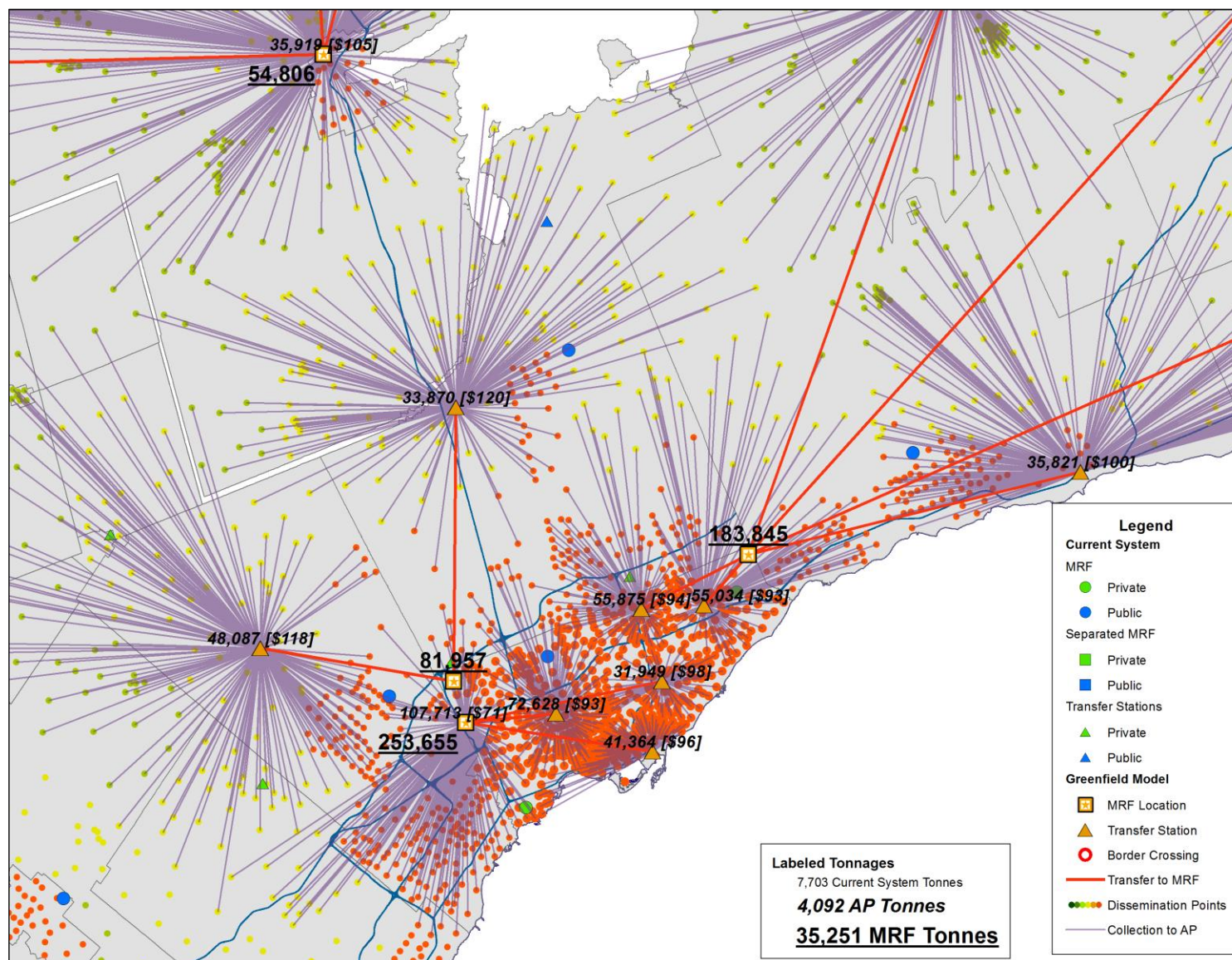
Figure 9: Option 1-Ba for the Central Region



Note: Not all labels shown in the GTA area; please see the following GTA map for full details.

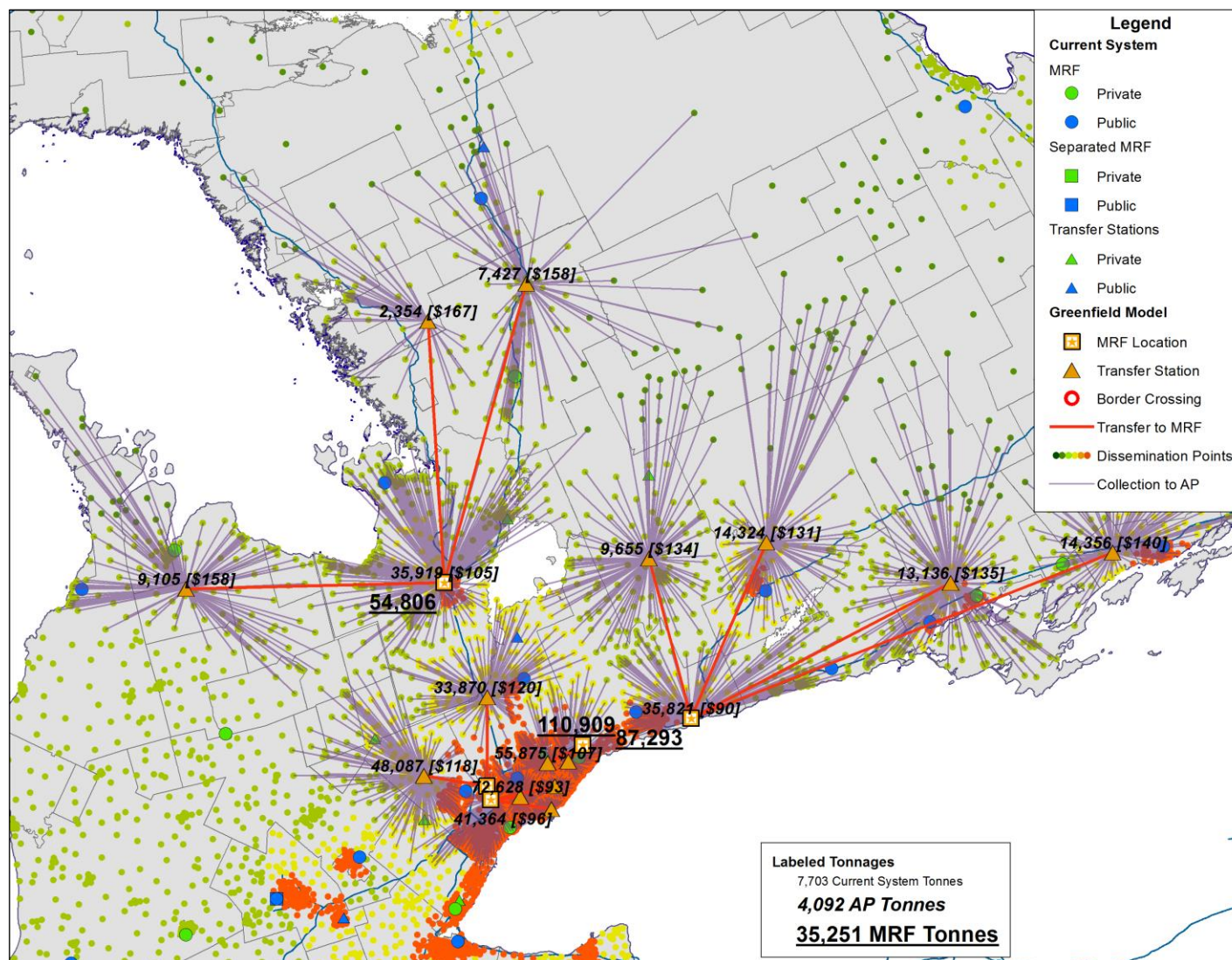


Figure 10: Option 1-Ba for the GTA





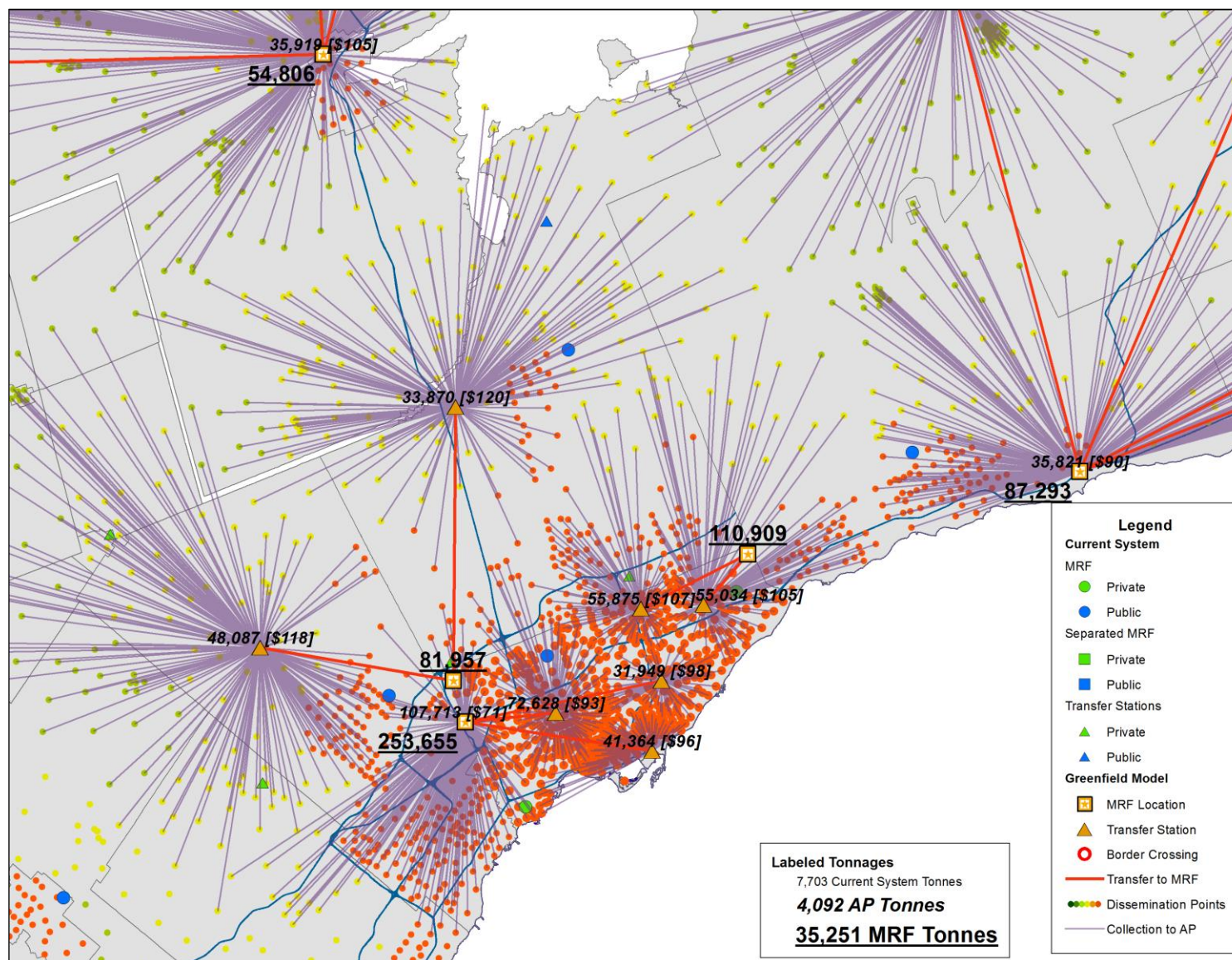
**Figure 11: Option 2 for the Central Region**



Note: Not all labels shown in the GTA area; please see the following GTA map for full details.

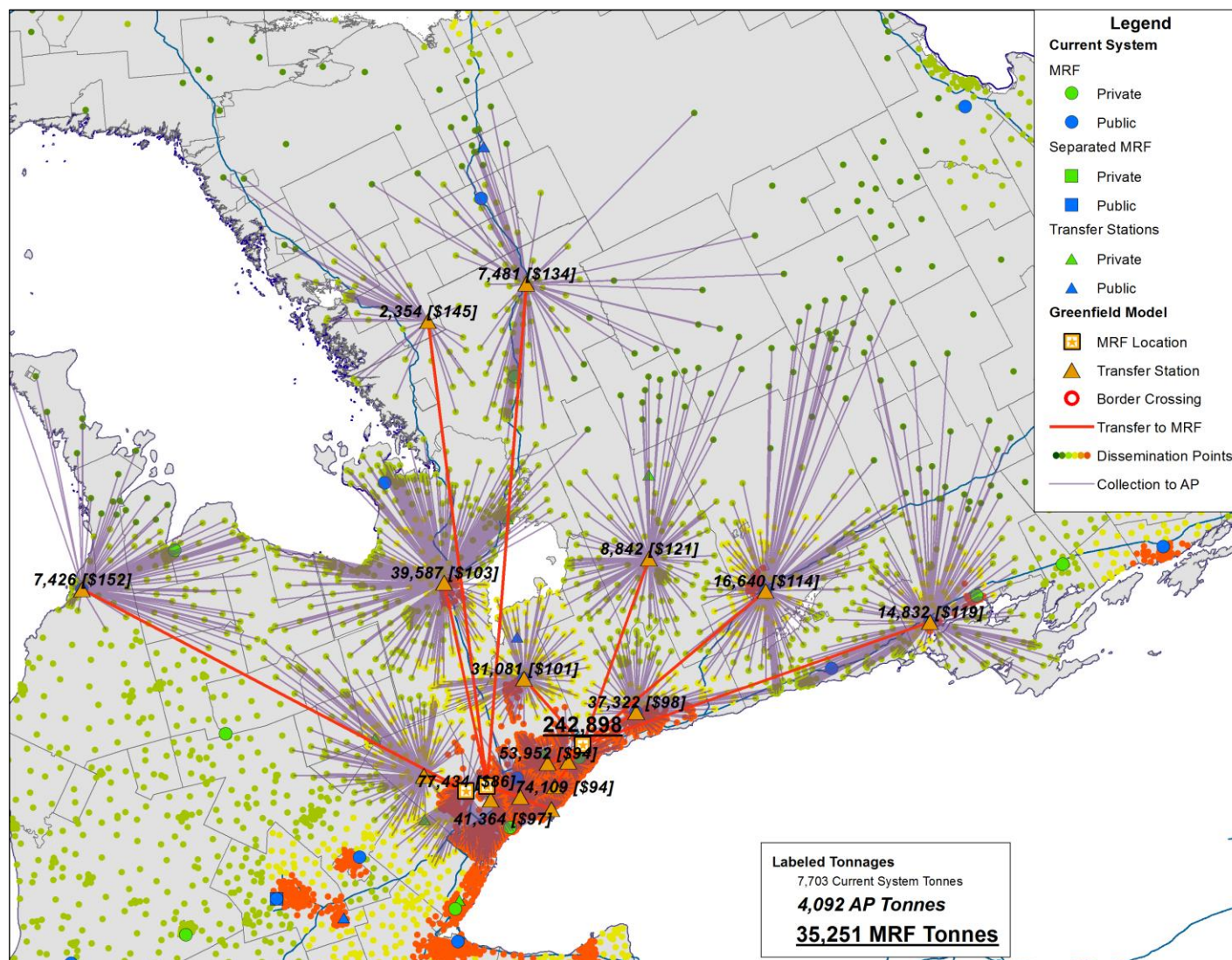


**Figure 12: Option 2 for the GTA**





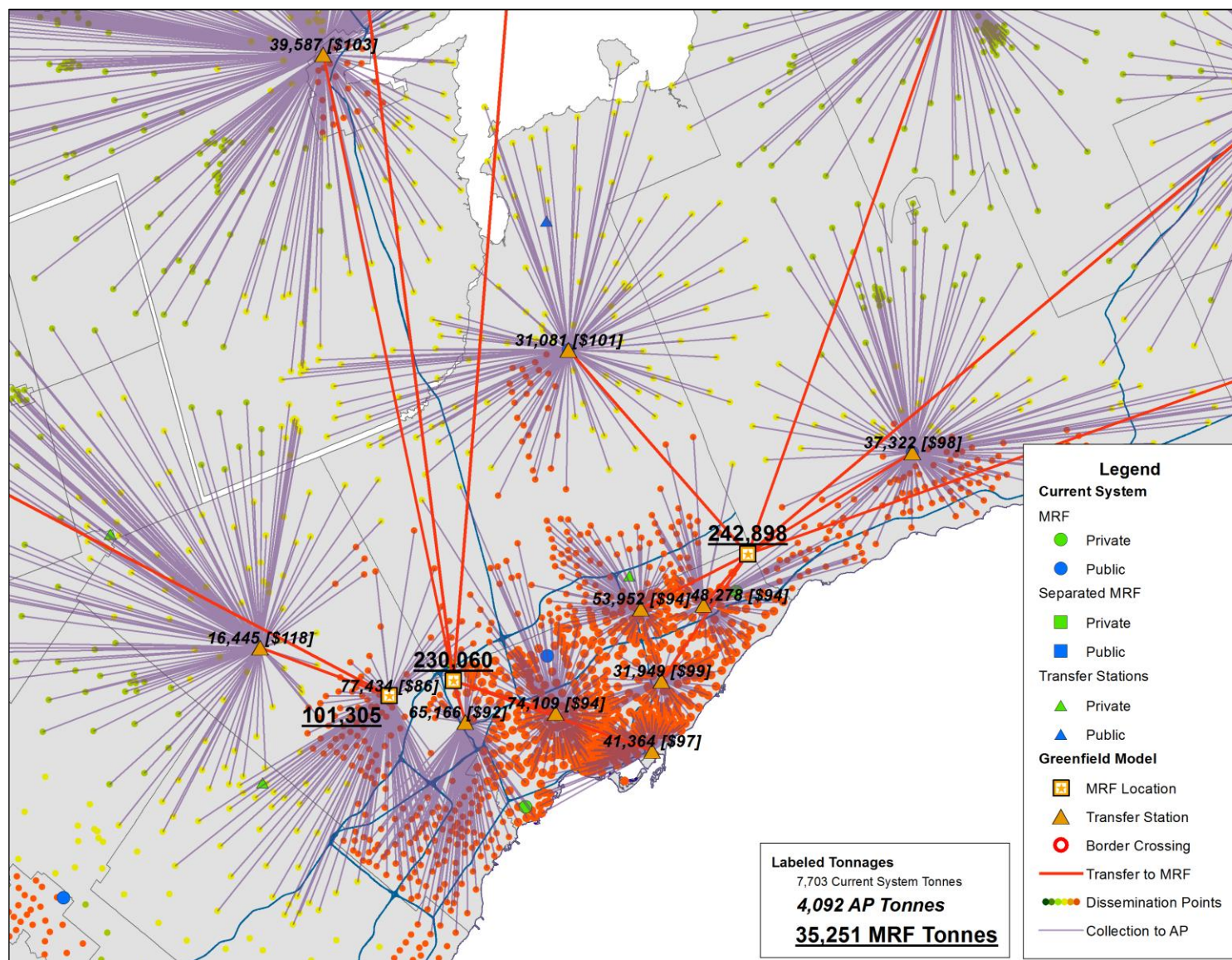
**Figure 13: Baseline A for the Central Region**



Note: Not all labels shown in the GTA area; please see the following GTA map for full details.

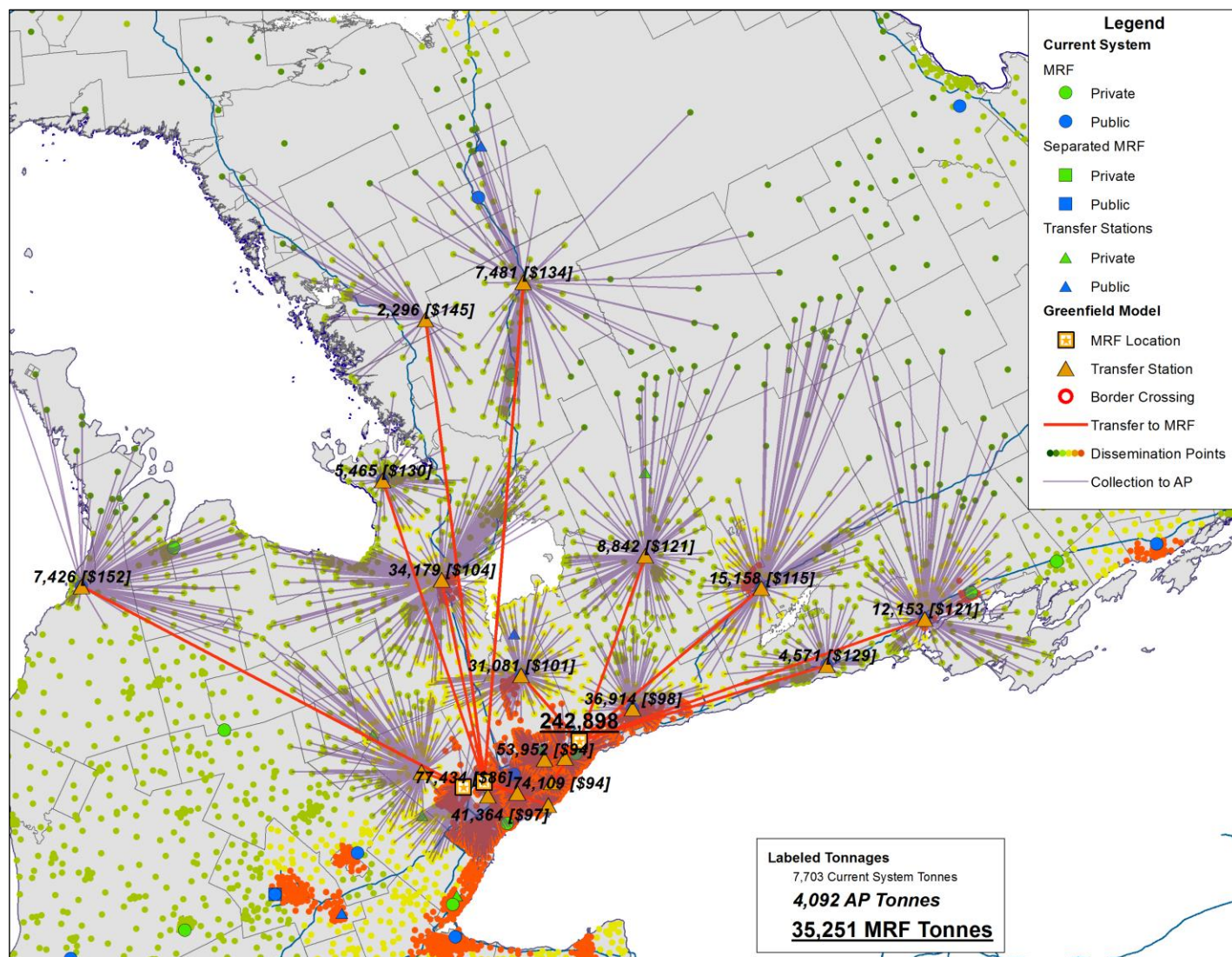


Figure 14: Baseline A for the GTA





**Figure 15: Baseline B for the Central Region**



*Note: Not all labels shown in the GTA area; please see the following GTA map for full details.*



Figure 16: Baseline B for the GTA

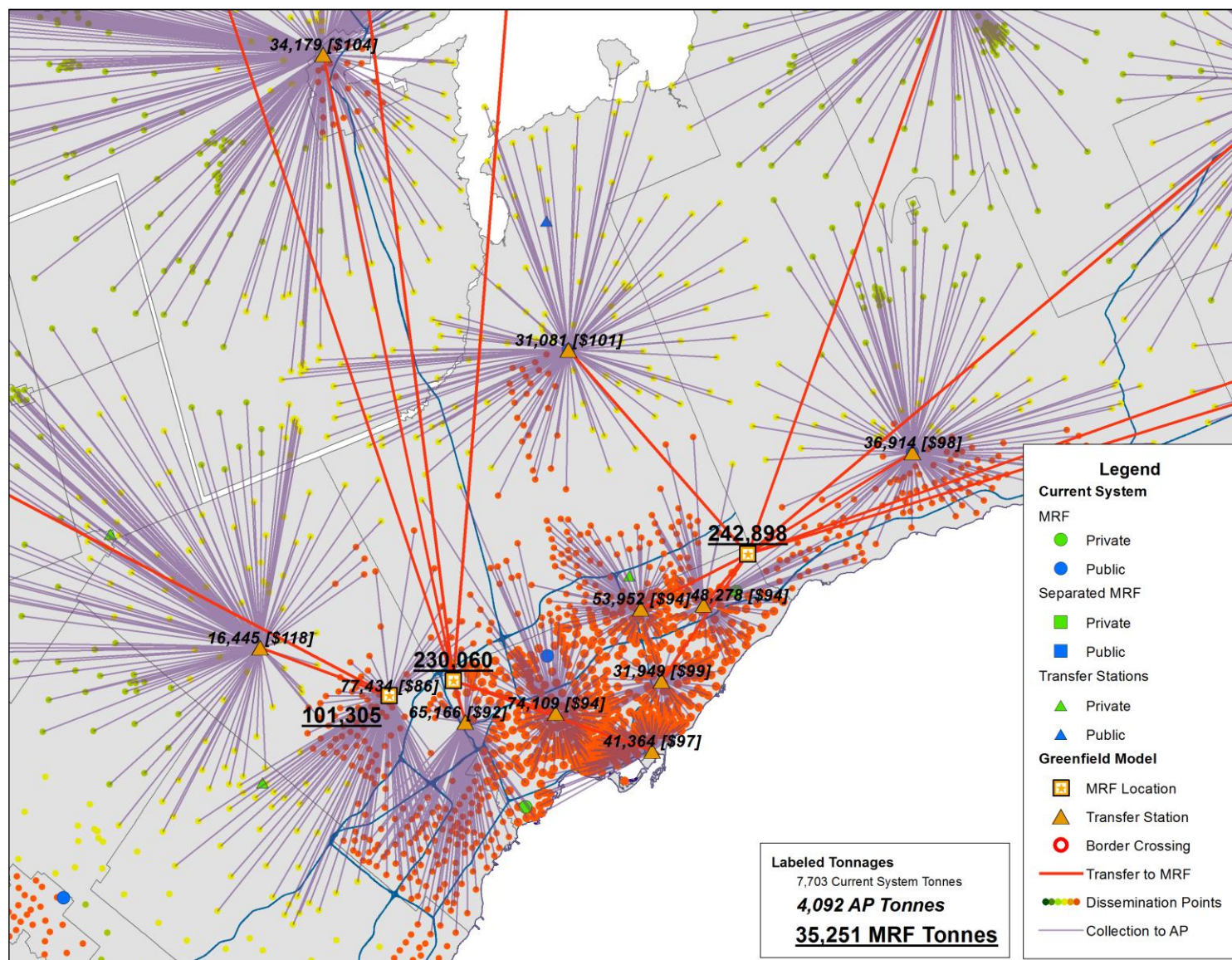
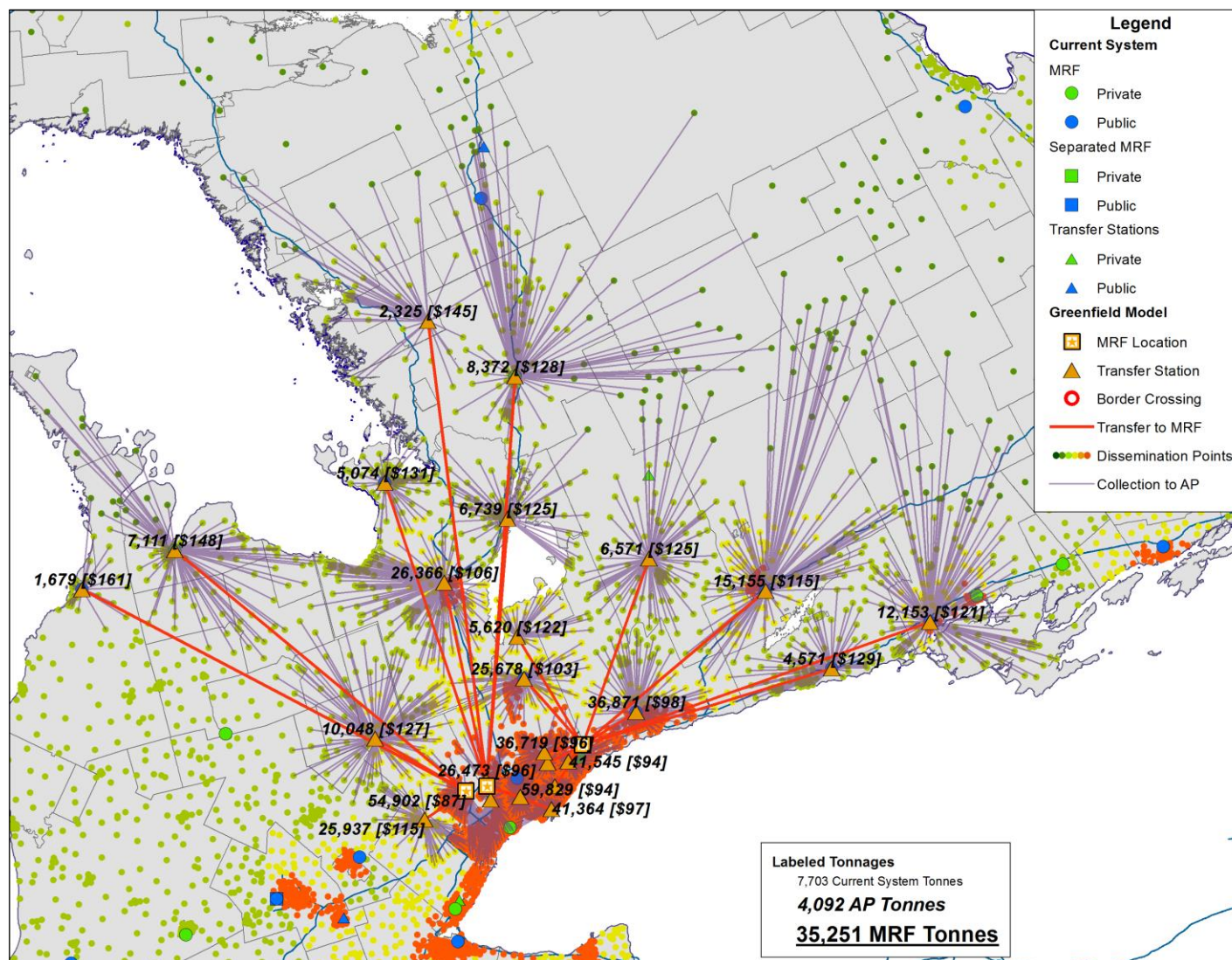




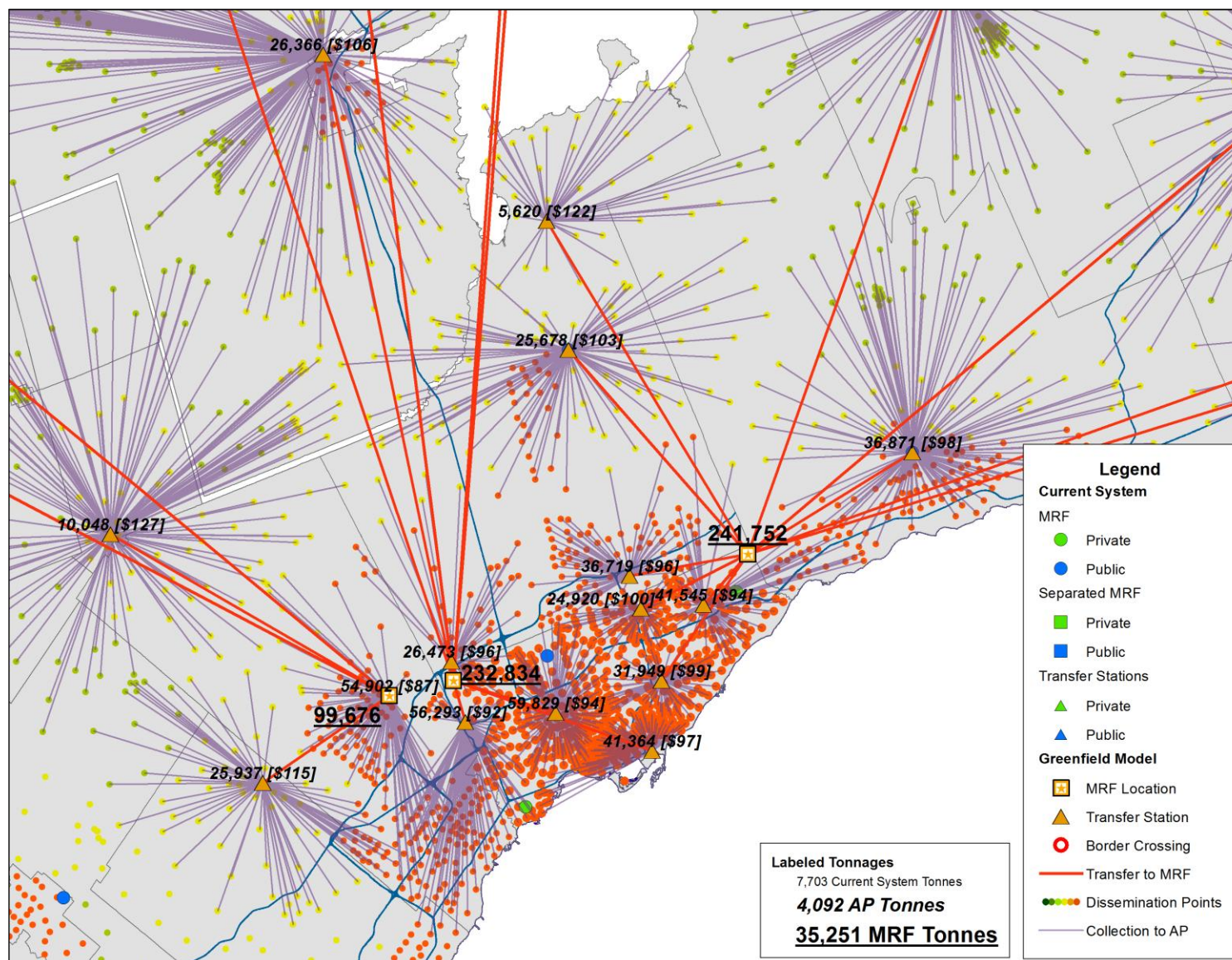
Figure 17: Baseline C for the Central Region



Note: Not all labels shown in the GTA area; please see the following GTA map for full details.

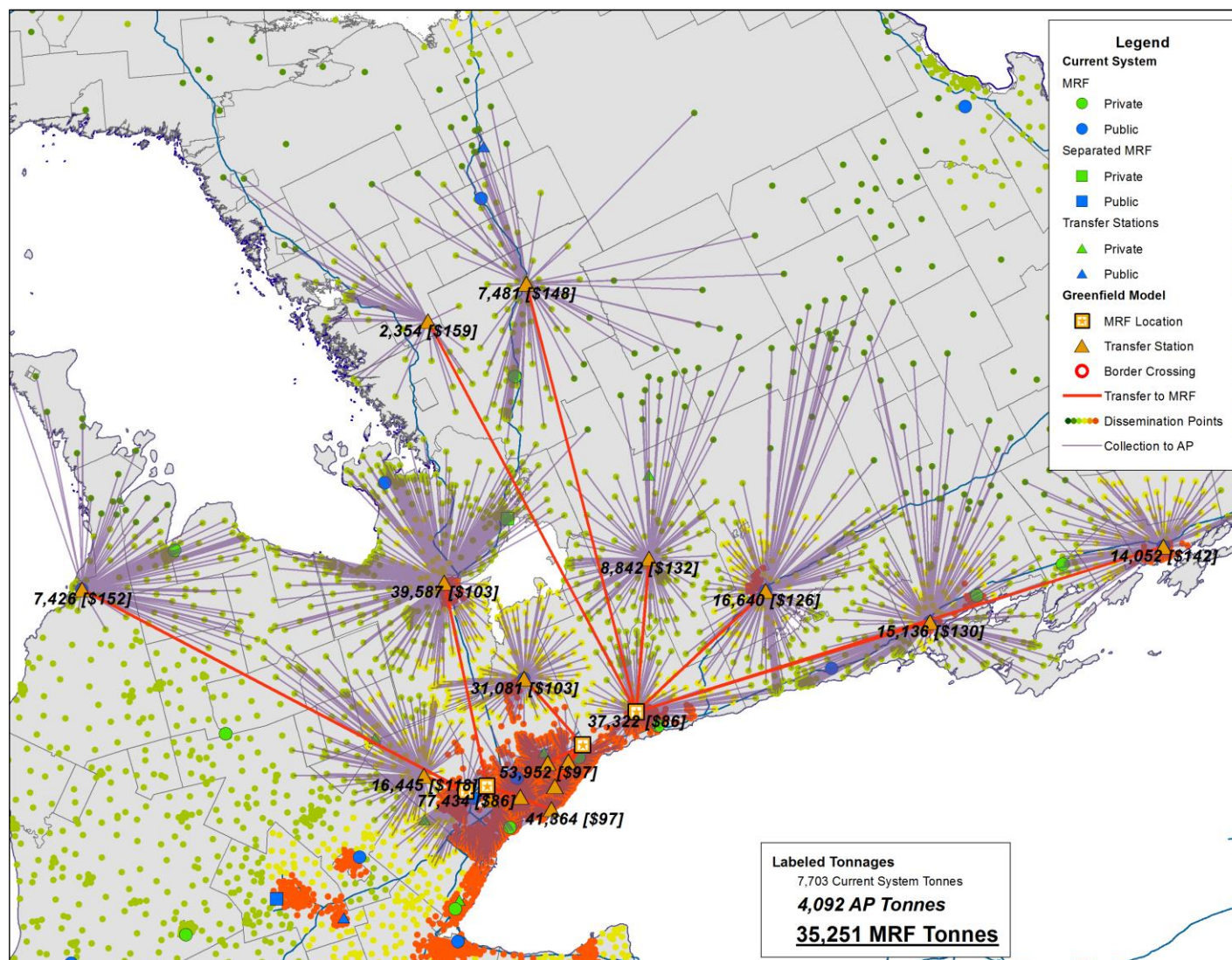


Figure 18: Baseline C for the GTA





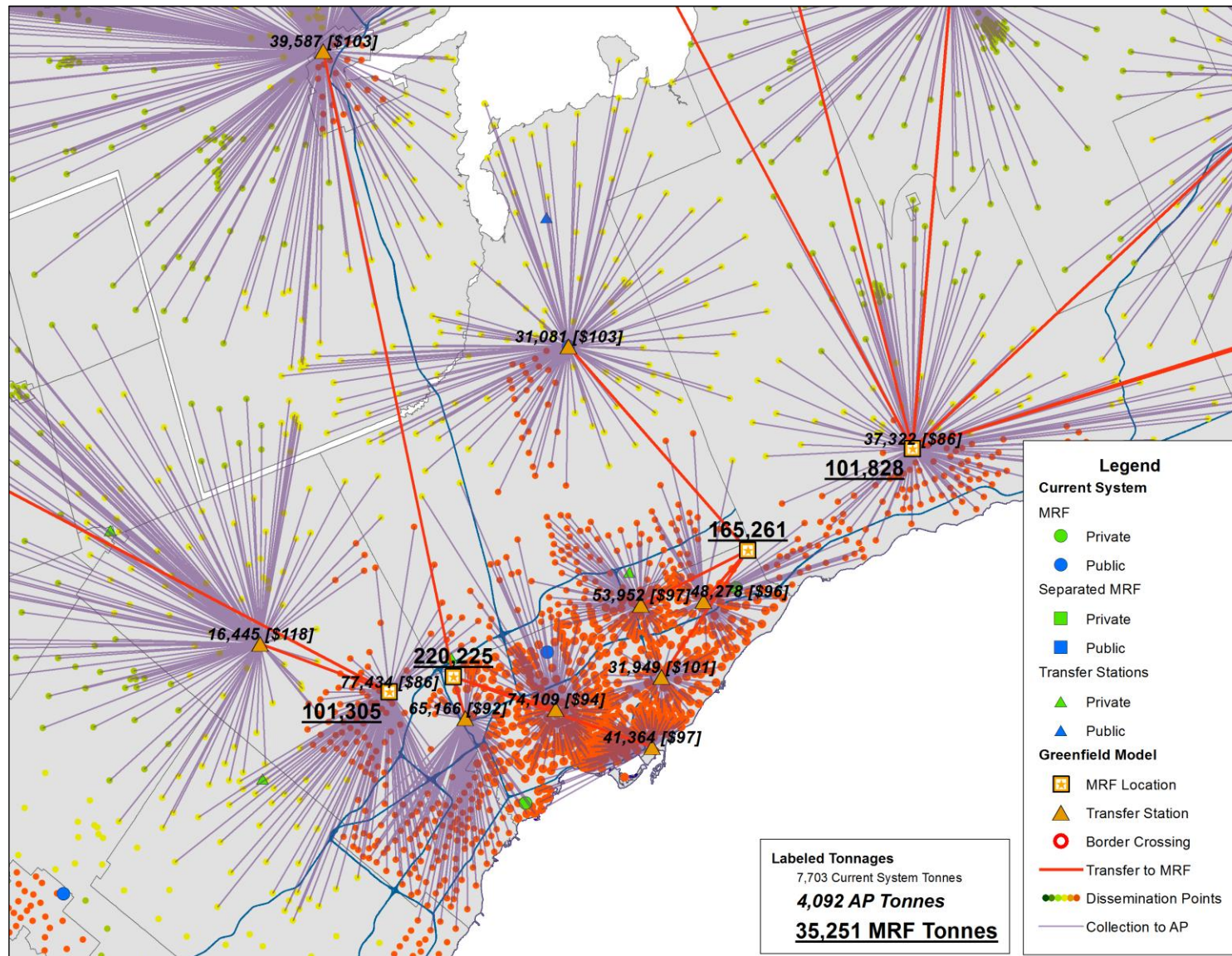
**Figure 19: Option 1A for the Central Region**



Note: Not all labels shown in the GTA area; please see the following GTA map for full details.

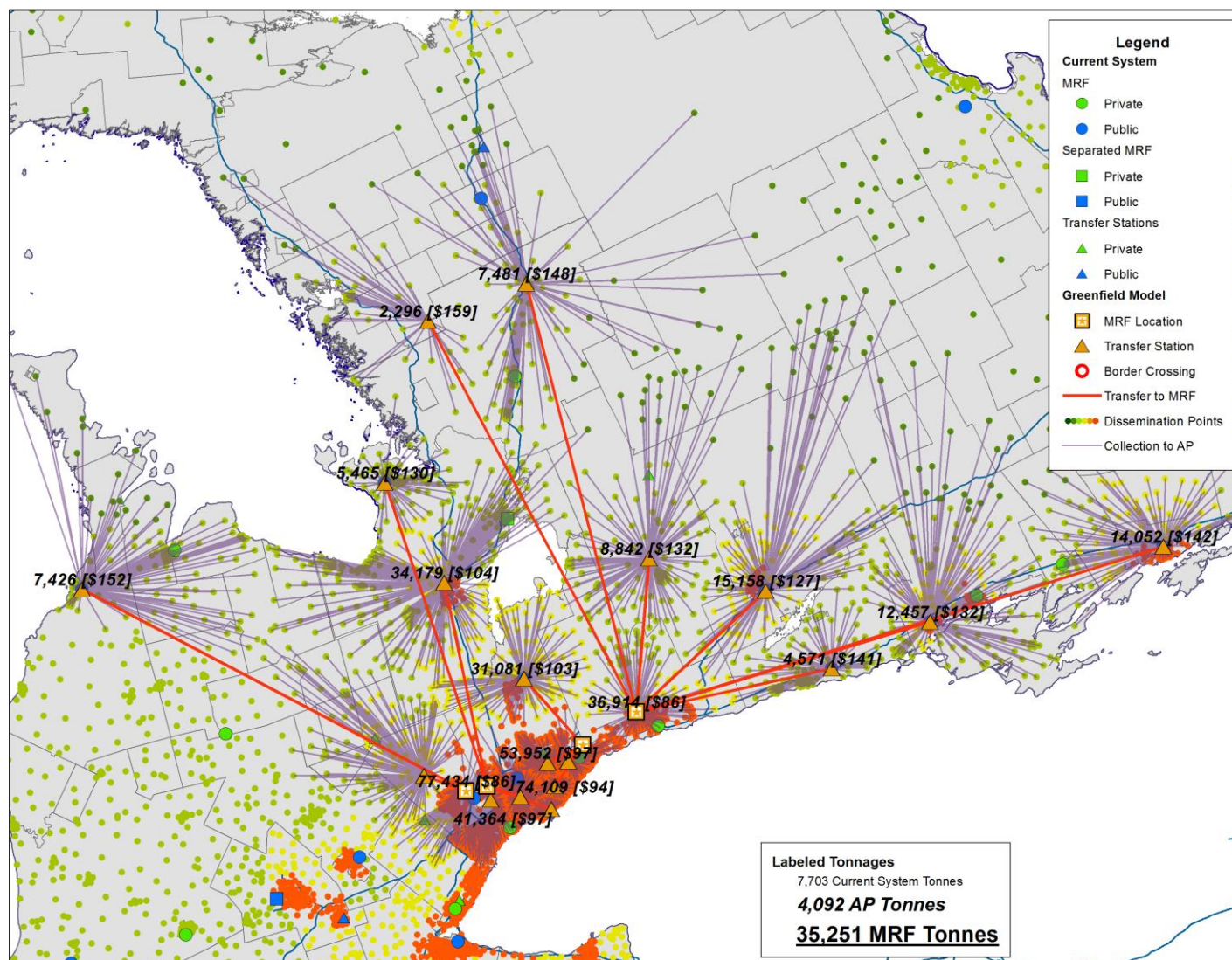


Figure 20: Option 1A for the GTA





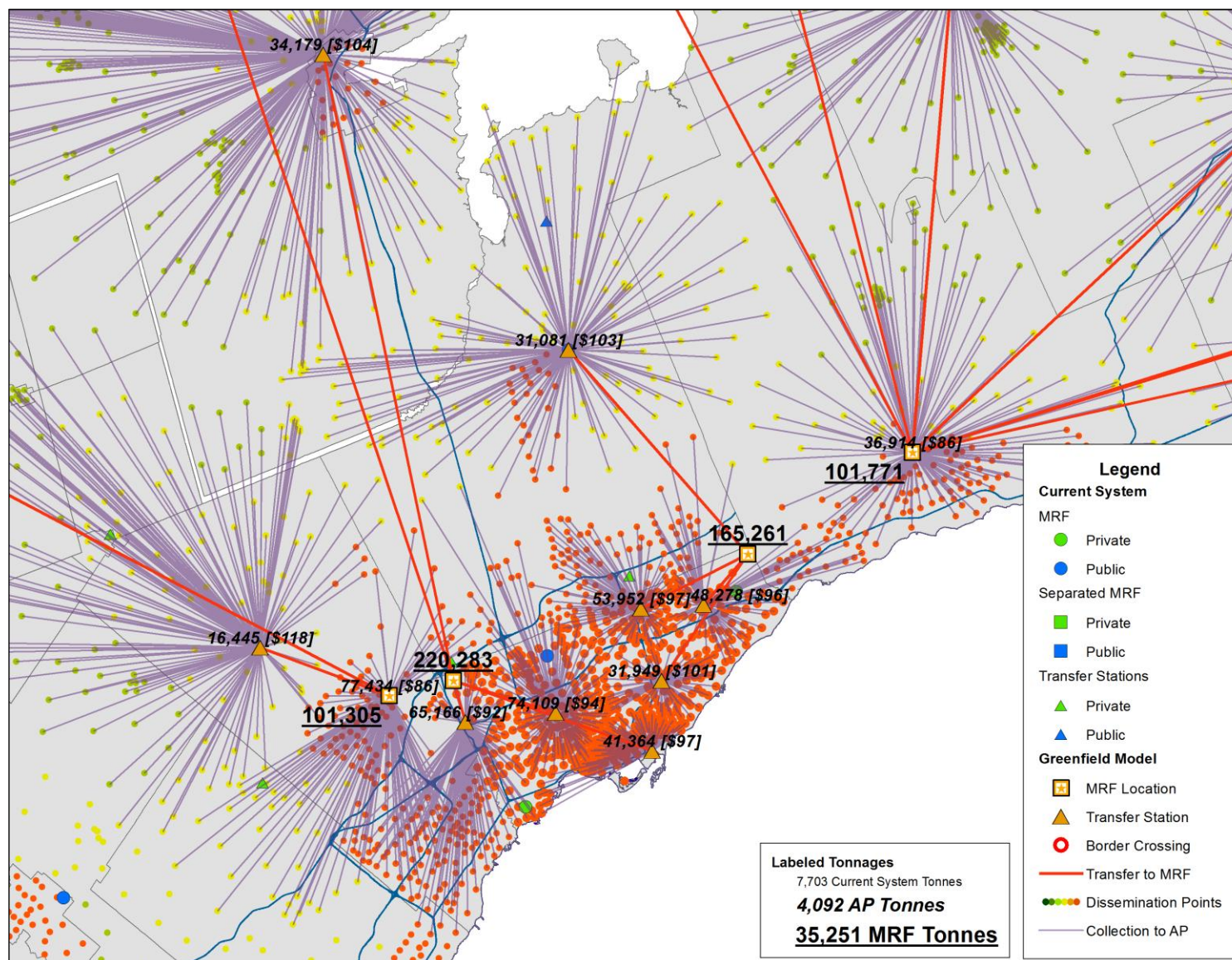
**Figure 21: Option 1B for the Central Region**



*Note: Not all labels shown in the GTA area; please see the following GTA map for full details.*

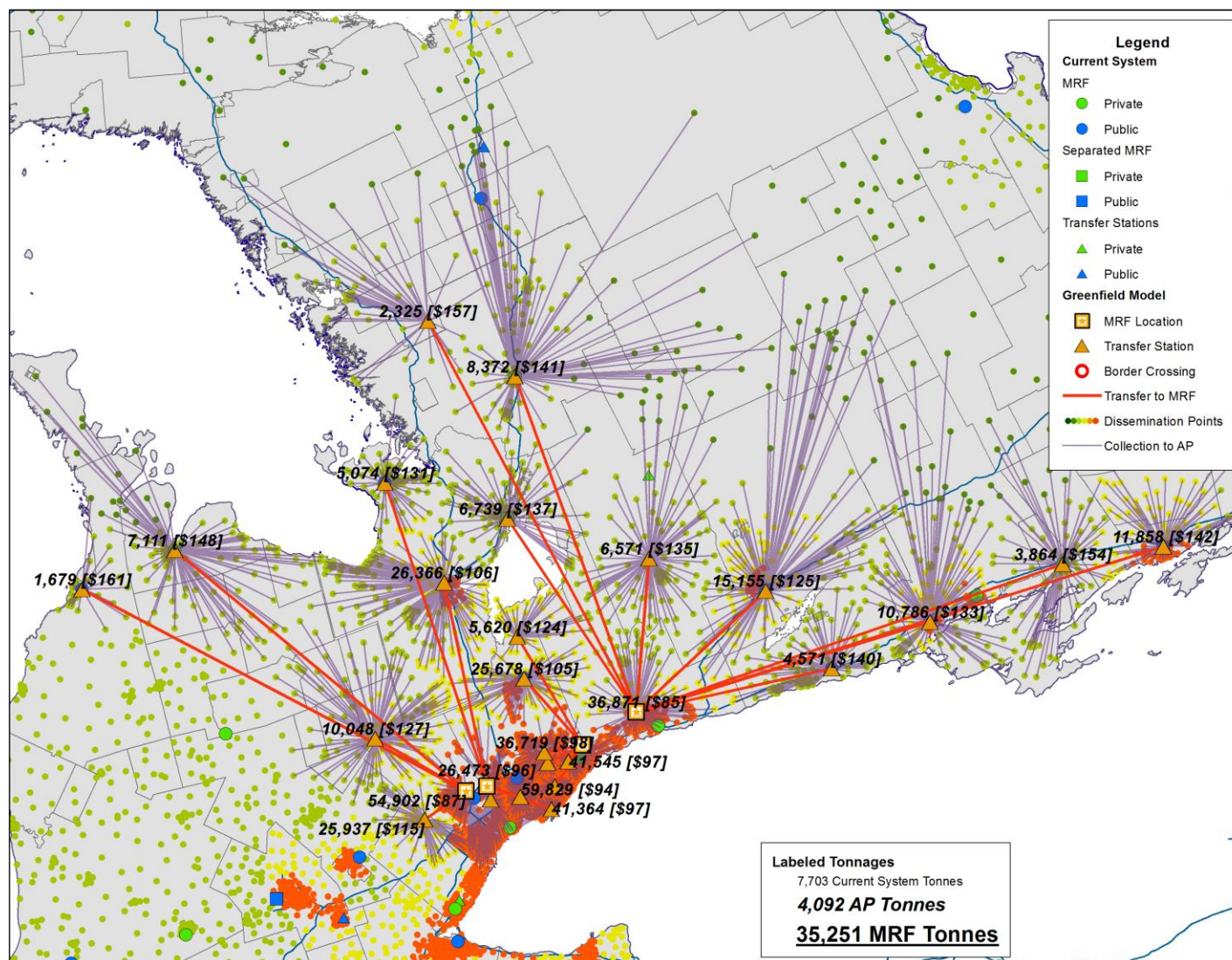


**Figure 22: Option 1B for the GTA**





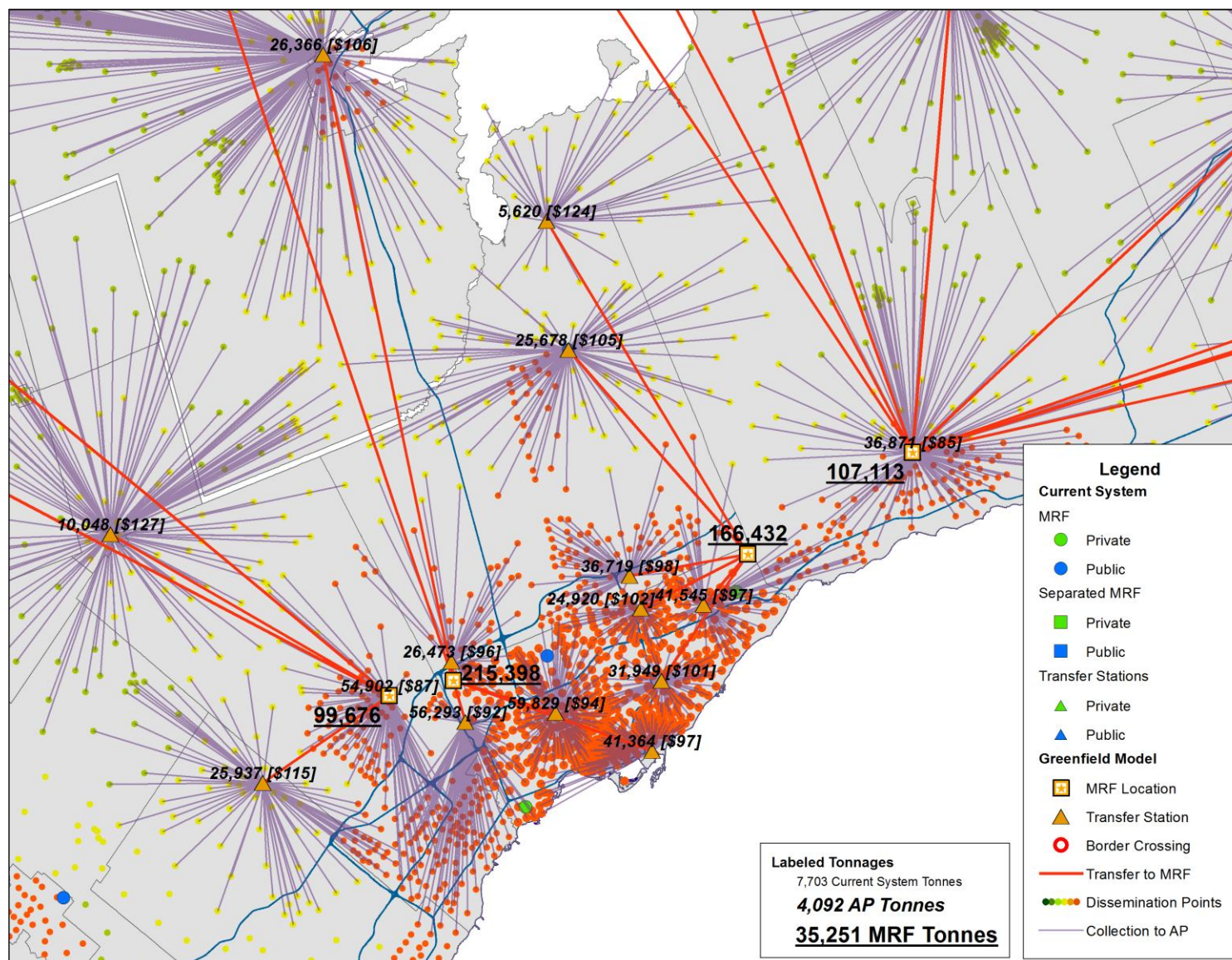
**Figure 23: Option 1C for the Central Region**



Note: Not all labels shown in the GTA area; please see the following GTA map for full details.



**Figure 24: Option 1C for the GTA**



### 3.2.12. 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 central region has five aggregation points that cover a significant percentage of seasonal homes. However, further analysis of the local data will be required for actual design and sizing of all transfer facilities, noting that other areas also may experience seasonal variation in the quantities of residential material managed.

- The aggregation point located in Seguin may experience seasonal peaks increasing by up to 60%. This increases the average weekly tonnes from 36 to 56, pushing the limits of the small transfer station during peak times. However, it is likely not justifiable to build a significantly larger transfer station for the anticipated throughput. Instead it may be feasible to operate longer hours during the summer. Therefore, the estimated capital cost for the conversion has not been adjusted.
- The aggregation point located in Muskoka may experience seasonal peaks increasing by up to 50% or more. This increases the average weekly tonnes from 134 to 202. In either case this requires the assumed medium transfer station and so the estimated capital cost for the conversion has not been adjusted.
- The aggregation points located in Peterborough, Kawartha and Chatsworth also may experience seasonal peaks increasing by up to 15% to 20%. However, this will not significantly affect the design of any of these three transfer stations and so the estimated capital cost for the conversion has not been adjusted.

### 3.3. Central Region Conclusions

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

- Savings can be achieved in this region by reducing the number of MRFs from 15 down to a minimum of 3 state-of-the-art MRFs that would anchor the processing and transfer system
- In the Central Region, adding a fourth MRF in Durham increases costs by 4% and a fifth MRF in Barrie increases costs by 6%
  - The optimized system for this region does not have to get to the minimum number of MRFs to realize significant savings
- In the Central Region, maximizing the use of existing facilities as transfer stations increases operating costs by only 5% and decreases capital costs by 23%

The optimized Central Region system may utilize more than the minimum number of MRFs:

- Regional hub MRFs would be situated in Peel and Toronto East and West as well as potential hub MRFs in Barrie and/or Durham
- It should utilize as many existing facilities as possible
- Given the large volume processed in this region, this approach provides the greatest redundancy, with minor cost impacts, and also minimizes impact on direct haul (not quantified in this study) that might offset the 5% increase in operating cost for the processing system

Thus, developing primary hub MRFs around Toronto and possibly secondary hub MRFs are promising options to moving towards an optimized system for the Central 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 are not 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 Central Region and GTA 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?

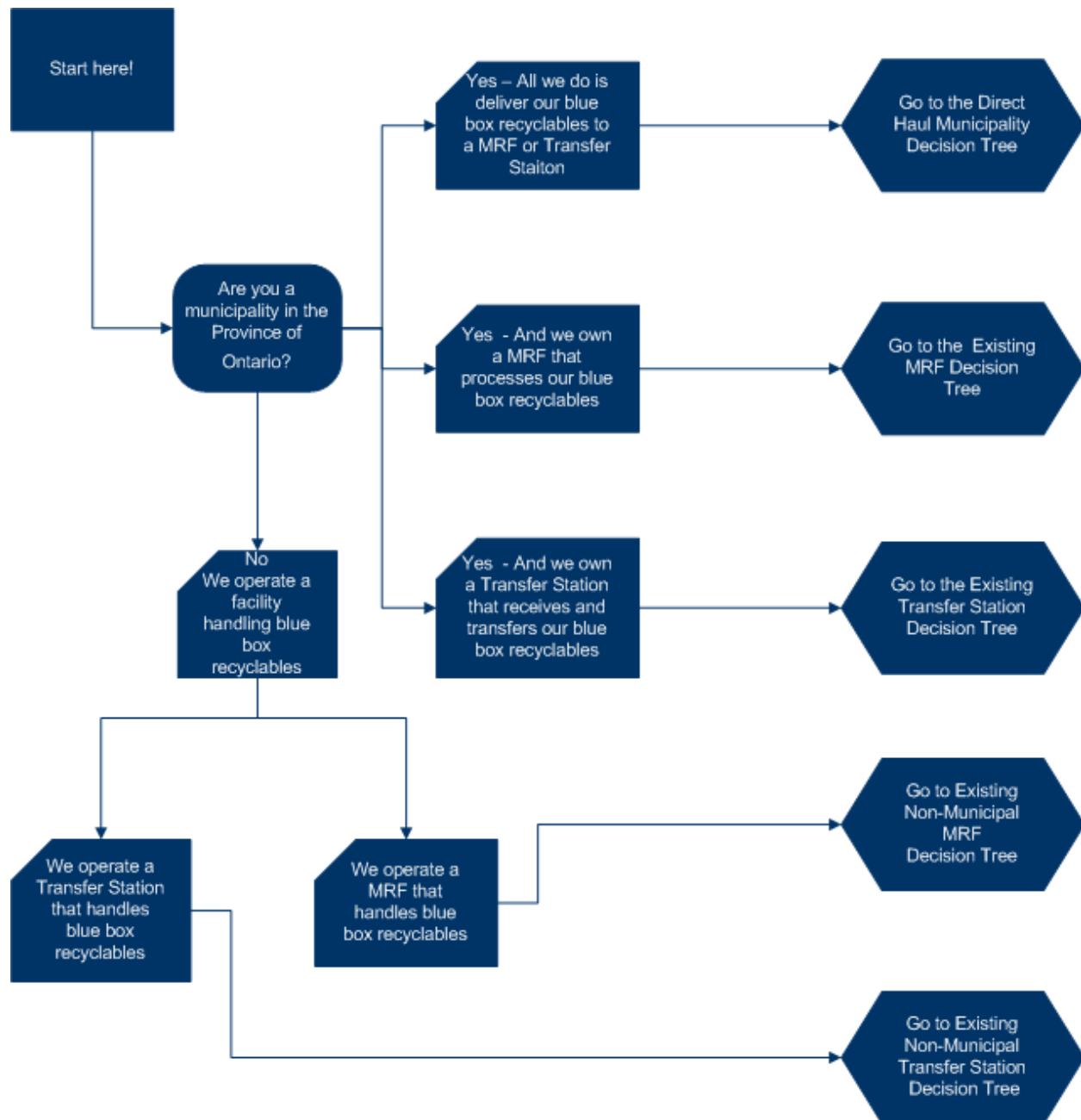
The decision tree then directs the user to the next sequential decision tree. For example:

- 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 25: 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 Central Region & GTA

Moving to a more optimized Blue Box processing system in the Central 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 MRFs and their 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. Central Region and GTA Lookup Tables

The results of the optimization model for the Central Region, presented in this volume, provide a robust set of opportunities to achieve optimization. Table 7 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 Toronto East, West and Peel Hub MRFs. The Durham Hub MRF is part of Option 1 and 2, but not Baseline or Option 1-Ba. The Barrie Hub MRF is part of Option 1-Ba and Option 2 only.

**Table 7: Lookup Table for Hub MRFs**

Facility	City	Province	Baseline	Option 1	Option 1-Ba	Option 1
<b>Hub MRF</b>	Toronto – East	ON	MRF	MRF	MRF	MRF
<b>Hub MRF</b>	Toronto - West	ON	MRF	MRF	MRF	MRF
<b>Hub MRF</b>	Peel	ON	MRF	MRF	MRF	MRF
<b>Hub MRF</b>	Durham	ON		MRF		MRF
<b>Hub MRF</b>	Barrie	ON			MRF	MRF

Table 8 shows the transition of existing locations to their new potential functions in the Baseline A, B and C as well as Option 1 A, B and C scenarios. Some of these existing locations have potential for Hub MRFs roles – specifically Peel in all options and Durham in all Option 1 scenarios. Some locations have expected roles as transfer station roles in all options (e.g. Bruce, Peterborough, Quinte, York and the six Toronto transfer station sites). Most locations have potential under at least one scenario for a transfer station role in the optimized system.

**Table 8: Lookup Table for Role in Optimized Processing System for Current System Locations**

Facility Owner - Central	City	Province	Current Tonnes	Baseline A	Baseline B	Baseline C	Option 1A	Option 1B	Option 1C
Armour, Township Of	Armour	ON	264.3						
Bruce Area Solid Waste Recycling	Southampton	ON	3,892.9	TS	TS	TS	TS	TS	TS
Canada Fibres	Etobicoke	ON	7,456.5						
Durham, Regional Municipality of	Whitby	ON	45,161.9	TS	TS	TS	MRF	MRF	MRF
HGC Management Inc.	Belleville	ON	561.7						
Kingston, City of	Kingston	ON	10,817.6				TS	TS	TS
Manco	Napanee	ON	1,643.6						TS
Miller Waste Systems - WMC	Owen Sound	ON	4,674.9			TS			TS
Metro Municipal Recycling Services	Toronto	ON	85,256.1						
Northumberland, County of	Grafton	ON	11,991.2		TS	TS		TS	TS
Peterborough, City of	Peterborough	ON	12,981.5	TS	TS	TS	TS	TS	TS
Peel, Regional Municipality of	Brampton	ON	90,367.2	MRF	MRF	MRF	MRF	MRF	MRF
Quinte Waste Solutions	Trenton	ON	11,044.3	TS	TS	TS	TS	TS	TS
Simcoe, County of	Midland	ON	11,051.5		TS	TS		TS	TS
Toronto, City of	Toronto	ON	69,753.8						
Waste Services Inc./BFI	Bracebridge	ON	33,613.5			TS			TS
York, Regional Municipality of	East Gwillimbury	ON	78,493.5	TS	TS	TS	TS	TS	TS
TS - Dufferin Transfer & Recycling Facility - Sandhill Disposal	Orangeville	ON	5,989.9			TS			TS
TS - Gooderham Transfer Station	Gooderham	ON	356.4						
TS - Landfill – Strong, Township of	Strong	ON	163.1						
TS - Leferink Transfer Limited	Georgetown	ON	20,867.9			TS			TS
TS - Mid Ontario Disposal	Orillia	ON	4,312.4			TS			TS
TS – Toronto City of - Scarborough	Toronto	ON	26,407.3	TS	TS	TS	TS	TS	TS

Facility Owner - Central	City	Province	Current Tonnes	Baseline A	Baseline B	Baseline C	Option 1A	Option 1B	Option 1C
<b>TS - Toronto, City Of - Bermondsey</b>	Toronto	ON	44,419.3	TS	TS	TS	TS	TS	TS
<b>TS - Toronto, City Of - Disco</b>	Toronto	ON	20,385.4	TS	TS	TS	TS	TS	TS
<b>TS - Toronto, City Of - Vic Park</b>	Toronto	ON	12,049.5	TS	TS	TS	TS	TS	TS
<b>TS - Toronto, City Of - Dufferin</b>	Toronto	ON	8,587.7	TS	TS	TS	TS	TS	TS
<b>TS - Toronto, City Of - Ingram</b>	Toronto	ON	43,160.7	TS	TS	TS	TS	TS	TS
<b>TS - York - York Region - Georgina Transfer Station</b>	Georgina	ON	Unknown			TS			TS
<b>TS - York - Miller - Earl Turcott Waste Management Centre</b>	Markham	ON	Unknown			TS			TS
<b>TS - York - Dongara</b>	Woodbridge	ON	Unknown			TS			TS

Direct haul communities that do not have existing facilities can use Table 9 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 the CIF, or similar champion take steps to guide the transition process in the Central 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**

It is essential that CIF, or similar champion, continue to press forward with region-wide review, discussion and tweaking of the initial results of the optimization model for the Central Region. This could be accomplished by CIF staff with technical support from the consulting team. 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 Central Region, it is clear that the Toronto East, West and Peel Hub MRFs 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 (Durham and/or Barrie).

##### **Hub MRF Development**

The Existing MRF Decision Tree is the starting point for identifying the Hub MRF development track for the Peel and Durham locations, and the Greenfield Hub MRF Decision Tree is the starting point for Hub MRF development for the potential Toronto East and West as well as Barrie Hub MRFs. A key precedent step will be Toronto moving through its Existing Transfer Station and Direct Haul Municipality Decision Trees to determine if they, as a potential host community/sponsoring agency, may be in a position to engage with CIF or some other agency in providing regional leadership in development of the Toronto East and West Hub MRFs. Similarly, Barrie will need to move through its Direct Haul Municipality Decision tree to determine if they are prepared to serve as a potential host community/sponsoring agency and engage with CIF or some other agency in providing regional leadership in development of the Barrie Hub MRF shown in Options 1-Ba and Options 2.

## **Private Merchant MRF Processing Capacity**

While certainly a factor in every region, the impact of potential private merchant MRF processing capacity on the Hub MRF development process in the Central Region will be a significant factor in the transition to an optimized hub and spoke Blue Box recyclables processing system. 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 Central 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 and Existing Transfer Station Decision Trees, 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 with 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 Central 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.

Toronto, with its dominant role in the optimized hub and spoke system, plays a key role in the overall system development. Its decisions on moving forward with Hub MRF development will impact the potential for the Durham and/or Barrie Hub MRF options to become viable. The future transfer station locations and direct haul communities with supply that will potentially be delivered to these projects will benefit from earlier, rather than later, clarification as to which of these options are viable for negotiation of long term service agreements.

## **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 9 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 2 municipalities in the central region in 2013 and another 6 come due in 2014, mainly collection/depot and transfer contracts. Toronto has recently contracted to Canada Fibres for processing for up to 140,000 tonnes effective April 2013 for 7 year, and that facility may have additional capacity available as a regional facility. Just to the

west near Cambridge, the new Waste Management Inc. single-stream facility also could influence the flow of material from the Central Region. The Durham Region processing contract also is due in 2012 and is likely to have been resolved.

**Table 9: Direct Haul Lookup Table**

Program	Direct Haul Facility Type	Region	Hub MRF	Multiple Regions	Baseline	Option 1	Option 1-BA	Option 2
Halton	TS/MRF	C	Toronto	C/SW	X	X		X
Durham	TS/MRF	C	Durham	No		X		X
	TS/MRF	C	Toronto	No	X	X		X
Northumberland	TS/MRF	C	Durham	No		X		X
	TS	C	Toronto	No	X			
Barrie	TS	C	Toronto	No	X	X		
	MRF	C	Barrie	No				X
Wellington	TS	C	Toronto	C/SW	X	X	X	X
Owen Sound	TS	C	Toronto	C/SW	X	X		
	TS	C	Barrie	C/SW			X	X
Orillia	TS	C	Toronto	No	X	X		
	MRF	C	Barrie	No			X	X
Orangeville	TS	C	Toronto	No	X	X	X	X
Quinte West	TS	C	Durham	C/E		X		X
	TS	C	Toronto	C/E	X		X	
Peterborough County	TS	C	Toronto	No	X		X	
	MRF	C	Durham	No		X		X
Muskoka	MRF/TS	C	Barrie	No			X	X
	TS	C	Toronto	No	X	X		
York	TS	C	Toronto	No	X	X	X	X
Chatsworth	TS	C	Toronto	C/SW	X	X		
	TS	C	Barrie	C/SW			X	X
Dysart and Others	TS	C	Toronto	No	X	X		



Program	Direct Haul Facility Type	Region	Hub MRF	Multiple Regions	Baseline	Option 1	Option 1-BA	Option 2
	TS	C	Barrie	No			X	X
<b>The Blue Mountains</b>	TS	C	Barrie	No			X	X
	TS	C	Toronto	No	X	X		
<b>Algonquin Highlands</b>	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No			X	X
<b>Shelburne</b>	TS	C	Toronto	No	X	X	X	X
<b>Armour, Burks Falls and Ryerson</b>	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No			X	X
<b>Bruce Area Solid Waste Recycling</b>	TS	C	Toronto	C/SW	X	X		
	TS	C	Barrie	C/SW			X	X
<b>Amaranth</b>	TS	C	Toronto	No	X	X	X	X
<b>Mono</b>	TS	C	Toronto	No	X	X	X	X
<b>Leeds and the Thousand Islands</b>	TS	C	Durham	C/E		X	X	X
	MRF/TS	C	Toronto	C/SW	X	X		
<b>Melancthon</b>	MRF	C	Toronto	C/SW			X	X
	TS	C	Barrie	C/SW			X	X
<b>Georgian Bluffs</b>	TS	C	Toronto	C/SW	X	X		
	TS	C	Barrie	C/SW			X	X
<b>Meaford</b>	TS	C	Toronto	C/SW	X	X		
	TS	C	Barrie	C/SW			X	X
<b>Parry Sound</b>	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No			X	X
<b>Prescott</b>	TS	C	Durham	C/E		X		X
<b>Whitestone</b>	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No			X	X
<b>East Luther Grand Valley</b>	TS	C	Toronto	No	X	X	X	X
<b>Peel, Regional Municipality of</b>	MRF/TS	C	Toronto	No	X	X	X	X

Program	Direct Haul Facility Type	Region	Hub MRF	Multiple Regions	Baseline	Option 1	Option 1-BA	Option 2
Gananoque	TS	C	Durham	C/E		X		X
Frontenac Islands	TS	C	Durham	C/E		X		X
East Garafraxa	TS	C	Toronto	No	X	X	X	X
Mulmur	TS	C	Toronto	No	X	X	X	X
	MRF	C	Barrie	No			X	X
Peterborough, City of	TS	C	Toronto	No	X			
	TS	C	Durham	No		X	X	X
South Frontenac	TS	C	Durham	C/E		X		X
Kingston	TS	C	Durham	C/E		X		X
Stone Mills	TS	C	Durham	C/E		X		X
Simcoe, County Of	TS	C	Toronto	No	X	X	X	X
	MRF	C	Barrie	No			X	X
Highlands East	TS	C	Toronto	No	X	X	X	X
Carling	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No			X	X
McDougall	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No			X	X
Greater Napanee	TS	C	Durham	C/E		X		X
Seguin	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No			X	X
McKellar	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No			X	X
Northern Bruce Peninsula	TS	C	Toronto	C/SW	X	X		
	TS	C	Barrie	C/SW			X	X
Carlow/Mayo	TS	C	Toronto	No	X		X	
	TS	C	Durham	No		X		X
Addington Highlands	TS	C	Toronto	C/E	X		X	

Program	Direct Haul Facility Type	Region	Hub MRF	Multiple Regions	Baseline	Option 1	Option 1-BA	Option 2
	TS	C	Durham	C/E		X		X
<b>Minden Hills</b>	TS	C	Toronto	No	X		X	
	TS	C	Durham	No		X		X
<b>Hastings Highlands</b>	TS	C	Toronto	C/E	X		X	
	TS	C	Durham	C/E		X		X
<b>Grey Highlands</b>	TS	C	Toronto	C/SW	X	X		
	TS	C	Barrie	C/SW			X	X
<b>Kawartha Lakes</b>	TS	C	Toronto	No	X	X		
	MRF	C	Barrie	No			X	X
	MRF	C	Durham	No		X		X
<b>Southgate</b>	TS	C	Toronto	C/SW	X	X		
	TS	C	Barrie	C/SW			X	X
<b>Perry</b>	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No	X	X		
<b>Central Frontenac</b>	TS	C	Durham	C/E		X		X
<b>Bancroft</b>	TS	C	Toronto	No	X		X	
	TS	C	Durham	No		X		X
<b>Deseronto</b>	TS	C	Durham	C/E		X		X
<b>Faraday</b>	TS	C	Toronto	No	X		X	
	TS	C	Durham	No		X		X
<b>Kearney</b>	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No			X	X
<b>Machar</b>	TS	C	Toronto	C/N	X	X		
	TS	C	Barrie	C/N			X	X
<b>Magnetawan</b>	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No			X	X
<b>McMurrich/Monteith</b>	TS	C	Toronto	No	X	X		



Program	Direct Haul Facility Type	Region	Hub MRF	Multiple Regions	Baseline	Option 1	Option 1-BA	Option 2
	TS	C	Barrie	No			X	X
<b>Strong</b>	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No			X	X
<b>Sundridge</b>	TS	C	Toronto	No	X	X		
	TS	C	Barrie	No			X	X
<b>Tudor and Cashel</b>	TS	C	Toronto	No	X		X	
	TS	C	Durham	No		X		X
<b>Kingston</b>	TS	C	Toronto	C/E	X		X	
	TS	C	Durham	C/E		X		X
<b>Chippewas of Nawash First Nation</b>	TS	C	Toronto	C/SW	X	X		
	TS	C	Barrie	C/SW			X	X
<b>Chippewas of Georgina Island First Nation</b>	TS	C	Toronto	No	X	X	X	X
<b>Chippewas of Rama First Nation</b>	TS	C	Toronto	No	X	X		
	MRF	C	Barrie	No			X	X
<b>Curve Lake First Nation</b>	TS	C	Toronto	No	X		X	
	TS	C	Durham	No		X		X
<b>Mohawks of the Bay of Quinte</b>	TS	C	Durham	C/E		X		X
	TS	C	Toronto	C/E	X		X	
<b>Township of the Archipelago</b>	MRF/TS	C	Barrie	No			X	X
	TS	C	Toronto	No	X	X		
<b>Toronto</b>	MRF	C	Toronto	No	X	X	X	X
<b>Wollaston</b>	TS	C	Toronto	C/E	X		X	
	TS	C	Durham	C/E		X		X