
3. Analysis of Land Use, Population, and Jobs Density: Selected Urban Growth Centres

This section analyses 10 census tracts (CTs) associated with Urban Growth Centres designated in the provincial *Places to Grow* Plan, in terms of their basic land use composition, population density, job density, and the density of population plus jobs together. For five of the selected tracts, we provide additional details to illustrate basic differences between older and new development patterns and their relationship to census geography.

As the scale of analysis changes from the regional to that of individual CTs, the effects of the modifiable areal unit problem (that is, the influence of the location of boundaries used for aggregation and analysis as discussed in Section 1), becomes significant. Within individual CTs, including or excluding a single-family housing area, an apartment cluster, an area in open space uses, or an employment or institutional area can affect density and other land use measurements considerably. The measured density of CTs depends on the mix of different intensities of land use within the tract.

Examining CTs in Urban Growth Centres shows differences in how census boundaries are drawn in older areas compared with newer areas. Boundary effects are not entirely random. In the most intensely developed CT examined, downtown Hamilton, the centre is much larger than the selected CT. This problem could be overcome by aggregating several CTs. In other older but smaller areas, such as Guelph or Kitchener, downtown CT boundaries bear more relation to the boundaries of the historic downtowns they contain. In newer centres, such as Mississauga and Scarborough, CT boundaries bear little relation to the area of the centre and tend to be very large, containing many types of development (including single-family subdivisions, land set aside for various kinds of open space, and even undeveloped land). These large areas in single use with large differences in density are in marked contrast to the older centres with their more mixed development. In places such as Markham, where centres are planned but not yet fully built, CTs tend to be very large and to contain a wide variety of development types separated into individual, relatively homogeneous areas.

Before we compare land use patterns and densities across the 10 selected tracts, we will identify the data sources and measurement issues involved.

3.1 Selected Tracts and Boundaries

Table 3.1 shows the CTs that were selected for the following Urban Growth Centres.

Table 3.1: Census Tracts and Urban Growth Centres

Name	Description	Tract
Barrie	Downtown	568000600
Brampton	Downtown	535057400
Hamilton	Downtown	537003700
Guelph	Downtown	550000600
Kitchener	Downtown	541001700
Markham	Markham Centre	535040103
Mississauga	Mississauga Centre	535052701
Oshawa	Downtown	532001000
Scarborough	Scarborough Town Centre	535036303
Waterloo	Downtown	541010200

The correspondence between CT boundaries and Urban Growth Centre planning areas varies. The CT for Hamilton is centred on the downtown, but does not contain the entire downtown area. The CT for Guelph contains and corresponds well to its traditional downtown core. CTs in newer centres tend to be problematic. That selected for Markham, for instance, excludes a large part of the area planned for Markham City Centre, but contains large areas of low-density employment and residential uses outside the planned centre. Given these anomalies, straightforward comparisons between the densities of selected tracts should not be made without taking into account boundary definitions and underlying land use patterns. We will discuss these points more fully when in the profiles of the individual tracts.

3.2 Data Sources

Density analysis of the Urban Growth Centres used two basic data sources. First, as in the regional analysis, 2001 census data was used for population and employment figures. Second, the Province supplied some basic land use information coded to individual parcels for the CTs of interest. Not all parcels were not coded. Basic land use categories were:

- residential;
- condominium;
- multi-residential;
- industrial;
- commercial;
- farm;
- vacant;
- park.

These data were compared to aerial photography, commercially available street maps, web mapping services, and the websites of the local municipalities to fill in missing values and identify parcels used for parks and open space, vacant land, and institutional uses. Obvious coding errors were also fixed, but data were not field-checked, nor was the legal status of open space determined. Therefore, land use designations should not be taken as definitive.

For analysis, all parcels in tracts were categorized as:

- residential;
- commercial (including industrial);
- institutional;
- open space;
- vacant.

The area of each designation was measured using GIS software. All remaining land was considered to be right-of-way (ROW). Some parcels associated with railway corridors were also included in ROW.

3.3 Definitions

Gross and net densities were measured for each of the CTs. As in the regional analysis, separate density calculations were made for population, jobs, and population-plus-jobs. Land use composition is presented in **Table 3.2**. Densities in all selected tracts are presented in **Table 3.3**.

- *Gross density* was measured by dividing the population, the number of jobs, or the population plus the number of jobs by the entire land area of the CT.
- *Net population density* was measured as the population divided by the aggregate area of residential parcels.
- *Net jobs density* was measured as the number of jobs divided by the aggregate area of commercial and institutional parcels.
- *Net population-plus-jobs density* was measured as the population plus the number of jobs divided by the aggregate area of residential, commercial, and institutional parcels.
- *Land use composition* for each CT was measured as hectares of land and the percentage of land in each use.

Gross and net densities represent the intensity of residential and employment development and the amount of land in each CT devoted to each intensity of use. The *intensity* of development is a familiar concept that captures the amount of activity in a defined area. For a given parcel of land, a high-rise apartment represents a more intense use than a detached house; a high-rise office building is more intense than a one-storey warehouse with few workers. When resident associations oppose increased density, it is more likely the increased intensity of development that is at issue.

The *extensiveness* of different uses is a less familiar but equally important aspect of density across a larger area. When measuring densities across any bounded area, the *amount* of land

devoted to different uses is as important as the intensity of development on individual parcels. For example, for similar intensities of development, CTs containing more residential and employment uses will have higher densities than tracts in which smaller areas are devoted to these uses and larger areas to parks, rights-of-way, or vacant land.

The distinction between the intensity and extensiveness of development is partly, but not entirely, related to the difference between net and gross densities. In practice, most CTs contain several types of development, with each type varying in intensity and extensiveness. For example, for two CTs with identical gross and net densities, one may have large areas devoted to detached housing, small areas devoted to high-rise apartments, and almost no open space, while the other has only small areas of detached housing, a substantial area of apartments, and large amounts of open space. This example demonstrates the importance of the *mix* of development intensities. This is not the same as *land use mix*, since any particular land use category may contain several types of development built at different intensities.

The heterogeneity of development types accounts for the crucial importance of the boundaries used in density calculations: does the boundary include or exclude a cluster of office towers, apartment buildings, or open space? The answer will strongly affect measured densities, whether gross or net. Therefore, unless the development being measured is homogeneous or the density ranges are at the extreme ends of the spectrum, the intensity and extensiveness of residential and employment uses combine in complex ways that make it impossible to relate density directly to urban form or built patterns.

3.4 Land Use Composition

Comparing the large variations in land use composition for the selected CTs highlights these issues. **Table 3.2** indicates that the size of CTs varies by about a factor of 25, from the 32-hectare Hamilton tract to the almost 800-hectare Markham tract. Generally, the older downtowns of Guelph, Hamilton, Kitchener, and Waterloo are smaller, while the newer centres of Markham, Mississauga, and Scarborough tend to be very large. Although Statistics Canada ostensibly uses population to define CT size, there is no clear pattern evident in this sample of CTs, where populations also vary widely and some very large tracts also have large populations (**Table 3.3**).

The percentage of land devoted to different use categories also varies greatly. In the sample CTs, much of the land is non-residential. For example, in Hamilton, Kitchener, Markham, and Scarborough, only 8 to 12 percent of the land is devoted to housing. Brampton has the largest proportion of residential land, at about 42 percent. Even this latter figure is low compared to the general distribution of urban land uses, where housing typically takes up far more than half of all urban land. Unlike CT size, however, these variations in residential use have little to do with the age of the centre or with population densities. For example, although only 12 percent of the Hamilton tract is in residential use, the tract has the highest gross population density of any tract studied (**Table 3.3**), because residential uses are very intensive, although not extensive. In general, CT boundaries that contain different mixes and intensities of land uses make comparisons difficult.

Table 3.2: Land Use

UGC		Total	Residential	Comm	Institutional	ROW	Open Space	Vacant
Barrie	<i>percent</i>	100	17.9	34.2	8.2	27.1	6.7	5.9
	<i>hectares</i>	148.6	26.5	50.8	12.2	40.2	10.0	8.8
Brampton	<i>percent</i>	100	41.7	10.9	12.9	21.8	9.4	3.3
	<i>hectares</i>	197.8	82.6	21.6	25.5	43.1	18.7	6.5
Guelph	<i>percent</i>	100	8.0	38.8	2.7	42.5	3.4	4.6
	<i>hectares</i>	60.1	4.8	23.3	1.6	25.6	2.0	2.8
Hamilton	<i>percent</i>	100	12.8	37.2	22.3	27.6	0	0
	<i>hectares</i>	31.6	4.1	11.8	7.0	8.7	0	0
Kitchener	<i>percent</i>	100	11.7	48.0	6.5	27.8	0	6.0
	<i>hectares</i>	66.3	7.8	31.8	4.3	18.4	0	4.0
Markham	<i>percent</i>	100	11.5	34.3	1.3	14.0	3.8	35.2
	<i>hectares</i>	791.1	90.7	271.1	10.4	110.7	29.8	278.4
Mississauga	<i>percent</i>	100	15.0	27.3	3.3	37.9	1.5	15.0
	<i>hectares</i>	245.6	36.9	66.9	8.1	93.0	3.8	36.9
Oshawa	<i>percent</i>	100	24.3	37.2	6.5	24.9	3.5	3.6
	<i>hectares</i>	131.7	32.0	48.9	8.6	32.8	4.6	4.7
Scarborough	<i>percent</i>	100	11.4	31.4	14.2	20.0	16.5	6.5
	<i>hectares</i>	310.2	35.3	97.5	44.0	62.2	51.2	20.1
Waterloo	<i>percent</i>	100.0	31.7	25.8	4.2	24.3	6.2	7.8
	<i>hectares</i>	116.2	36.9	30.0	4.9	28.2	7.2	9.0

Much of the tracts are devoted to employment uses. Commercial uses, including retail, office, and industrial land uses, are the largest category of land use in most cases, ranging from about a quarter (Waterloo) to almost half (Kitchener) of the land. The exception is Brampton, in which only 11 percent of the land is in commercial uses.

Institutional uses are a relatively minor category. The exception is the Brampton tract, with 13 percent institutional land, and the Hamilton tract, with an unusually high 22 percent of land devoted to institutional uses (the tract happens to contain Hamilton's city hall). When commercial and institutional lands are combined, about 60 percent of the Hamilton tract is devoted to employment uses. With only 1.3 percent of land in institutional use, the Markham tract is at the other end of the spectrum, but this percentage still represents 10 hectares of land, more institutional land than in six other tracts.

Most tracts have similar percentages of right-of-way (ROW). Six tracts have between 22 and 27 percent of their area in ROW, typical of many urban areas. Only 20 percent of the Scarborough tract consists of ROW; this includes the ROW for Highway 401, so local streets make up an even lower percentage. This pattern is a reflection of the large superblocks and sparse street systems associated with postwar modernist planning practices. Markham is an even more ex-

treme case, with only 14 percent of land in ROW, but the tract includes a large area of undeveloped land and excludes Highway 407 (which is not defined in the parcel data set).

At the other end of the range is Mississauga, where Highway 403 constitutes a large proportion of the tract, raising its ROW percentage to 38 percent. Otherwise, ROW makes up a low percentage of the tract area, similar to the Scarborough tract. Also on the high end is Guelph, with 42 percent of land in ROW, but this is because of an unusual early 19th-century street and block plan.

The CT boundaries are defined inconsistently with respect to major highways, a fact that highlights the modifiable areal unit problem. In the Scarborough tract, for example, the boundary runs along the centre of the ROW, while in the Mississauga tract the whole highway is included, raising the percentage of ROW and decreasing measures of gross density.

Open space, made up of park and environmental lands, varies substantially. It tends to be low in the older centres – both the Kitchener and Hamilton tracts have no land at all classified as open space – but newer centres, such as Mississauga with only 1.5 percent, can also have very little. Scarborough, with 16.5 percent of land in open space, has the largest proportion of the tracts studied.

Most tracts have little vacant land. In eight tracts, less than 8 percent of the total land is vacant. This means that any substantial increase in densities would require taking out some existing uses. Some tracts do have parking lots, classified as commercial land, as well as extensive areas of low-intensity uses that could be available for redevelopment. Mississauga, with 15 percent of its land vacant, has substantial capacity for new growth without redevelopment. The Markham tract, where 35 percent of the land is classified as vacant, is a potential centre, but not yet an actual one.

3.5 Density

Here too, we need to be cautious in drawing comparisons. Tract boundaries often have little relationship to actual or likely Urban Growth Centre planning areas and density measurements cannot necessarily be used to indicate built form. We will provide an overview of the range of densities among tracts and consider differences between gross and net densities. A more detailed description of the individual tracts is provided in the next section.

At the level of raw population and job numbers, there are large variations between the tracts. Populations vary from about 1,600 in the Guelph tract to almost 10,000 in the Scarborough tract. Jobs vary from about 5,000 in the Brampton tract to about 15,000 in the Markham tract. With the exception of Brampton, all tracts have more jobs than residents, but the ratio of jobs and people also varies widely.

There are also large variations in tract densities, both gross and net, and in the densities for population, employment, or population-plus-employment. For example, the Markham tract has 28 people-plus-jobs/ha while the Hamilton tract has 249 people-plus-jobs/ha, almost nine times as many.

For all types of density measured, the Hamilton tract has the highest density and the Markham tract has the lowest, except for net population density. In Hamilton, this reflects the fact that the tract contains only relatively intense downtown development. In Markham, the tract is extremely large and even net densities are low. **Table 3.3** shows gross and net densities for the 10 CTs.

Table 3.3: Gross and Net Densities for Selected Census Tracts

Urban Growth Centre	Pop.	Jobs	Jobs/Pop	Pop. Density (rank)			Emp. Density (rank)			Pop + Employment Density (rank)		
				gross	net	g/n	gross	net	g/n	gross	net	g/n
Barrie	3,509	6,005	1.7	24 (6)	132 (6)	5.6	40 (7)	95 (8)	2.4	64 (7)	106 (8)	1.7
Brampton	5,222	4,950	0.9	26 (5)	63 (10)	2.4	25 (9)	105 (7)	4.2	51 (9)	78 (9)	1.5
Guelph	1,610	5,670	3.5	27 (4)	335 (2)	12.5	94 (3)	228 (4)	2.4	121 (3)	245 (2)	2.0
Hamilton	2,503	5,360	2.1	79 (1)	618 (1)	7.8	170 (1)	285 (1)	1.7	249 (1)	344 (1)	1.4
Kitchener	1,501	8,330	5.5	23 (7)	193 (4)	8.5	126 (2)	230 (3)	1.8	148 (2)	224 (3)	1.5
Markham	7,494	14,765	2.0	9 (10)	83 (8)	8.7	19 (10)	52 (10)	2.8	28 (10)	60 (10)	2.1
Mississauga	4,212	9,955	2.4	17 (9)	114 (7)	6.7	41 (6)	133 (6)	3.3	58 (8)	127 (7)	2.2
Oshawa	4,585	9,250	2.0	35 (2)	143 (5)	4.1	70 (5)	161 (5)	2.3	105 (4)	154 (4)	1.5
Scarborough	9,968	11,520	1.1	32 (3)	282 (3)	8.8	37 (8)	81 (9)	2.2	69 (6)	122 (7)	1.8
Waterloo	2,516	8,220	3.3	22 (8)	68 (9)	3.2	71 (4)	235 (2)	3.3	92 (5)	150 (5)	1.6

Despite the contrast between the Hamilton and Markham tracts, the distinction between older downtowns and newer suburban areas is not a good predictor of population density, either gross or net. For example, Scarborough and Guelph have fairly similar gross and net population densities, but very different development patterns.

The ratio of gross to net population densities varies tremendously. In the Guelph tract, for example, net population density is 12.5 times higher than gross, but in the Brampton tract, net population density is only 2.5 times higher than gross. The old centre of Kitchener and the new centre of Markham have very similar gross-to-net ratios, for example, but very different built environments, since the ratio of gross to net density is affected by the intensity and extensiveness of residential land uses, rather than built form.

Older downtowns tend to have higher employment densities than newer, suburban areas. With gross employment density, this finding is partly a result of CT boundaries being more tightly drawn around old downtowns so that they contain a larger proportion of employment uses than newer areas. Older downtowns also have higher net employment densities, because they have more intensely developed employment uses than newer suburban areas. The ratio of gross to net job densities varies from 1.7 to 4.2, a more compressed range than that of the ratio of gross to net population densities. This is another indicator that employment land uses predominate in these tracts.

Population-plus-employment densities are more influenced by employment than are residential densities in most tracts. For either gross or net figures, the ranking of tracts in terms of population-plus-employment density is very similar to that for employment density alone, mainly because these tracts are dominated by employment uses.

3.6 Tract Profiles

Five of the CTs associated with Urban Growth Centres are described in detail below. These profiles illustrate the large differences in the way CTs capture development patterns in centres. For each tract, we provide a land use map, density figures, the mix of structural types of housing units, and a brief description. We also present some comparisons among the tracts, taking into account the mix, extent, and intensity of uses. The profiles show how these factors interact with tract boundaries to affect density measurements.

3.6.1 Brampton (CT 535057400)

This CT is centred on Brampton's old downtown around the intersection of Main and Queen Streets. The tract is fairly large – 198 hectares. Compared to other selected tracts, employment land uses are neither extensive (comprising only 24 percent of the tract area), nor intensive (with net densities of about 100 jobs/ha). In combination, this pattern gives rise to the lowest gross employment densities of any tract studied.

Large areas of parking, including a large GO commuter lot, indicate low development intensities. Institutional uses with large grounds also contribute to the low employment intensity.

Half the tract's housing units are single detached or semi-detached houses, giving rise to net population densities of only 63 people/ha, the lowest of any tract studied. Extremely large-lot housing in the southeast area of the tract is noteworthy. Although not intensive, housing is an extensive use, making up 42 percent of the tract. The gross population density is 26 people/ha, in the mid-range of the tracts studied. However, both gross and net population-plus-employment densities are low, at 51 and 78, respectively.

The area devoted to ROW is low, partly because fairly large areas are devoted to open space, and partly because of the large blocks in the tract, especially around larger institutional uses.

There is little vacant land in the tract, representing slightly more than 3 percent of the tract area, but some low-intensity uses could be redeveloped at higher intensities over time.

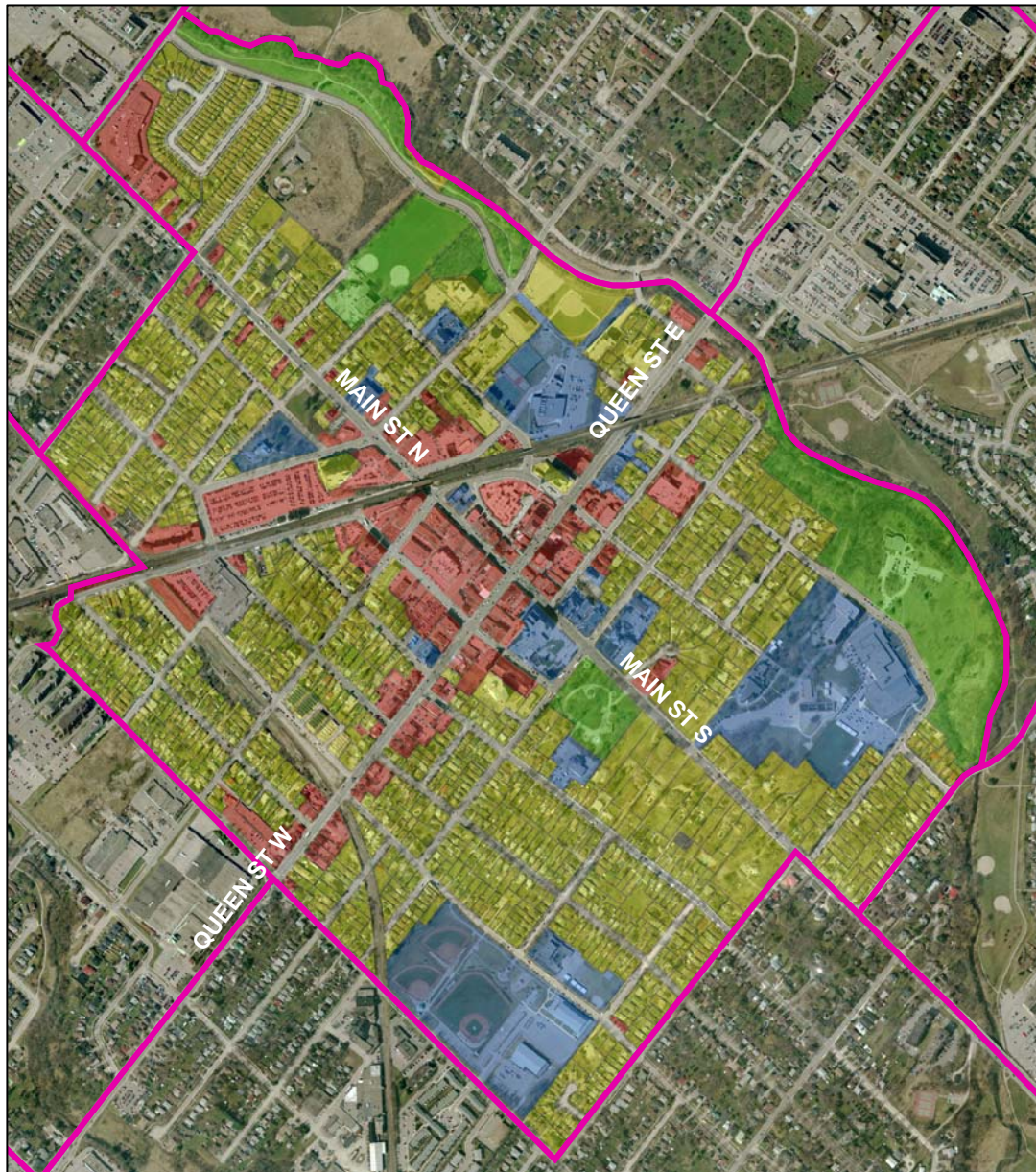
Table 3.4: Land Use – Brampton CT

	<i>percent</i>	<i>hectares</i>
Residential	41.7	82.6
Commercial	10.9	21.6
Institutional	12.9	25.5
ROW	21.8	43.1
Open Space	9.4	18.7
Vacant	3.3	6.5
Total	100.0	197.8

Table 3.5: Densities per Hectare – Brampton CT

Total Population	5,222
Total Jobs	4,950
Jobs/Population	0.9
Population Density	
Gross (change fm 1996)	26 (0.7)
Net	63
Gross/net	2.4
Employment Density	
Gross	25
Net	105
Gross/net	4.2
Population + Employment Density	
Gross	51
Net	78
Gross/net	1.5

Figure 3.1: Brampton Census Tract Land Use



0 100 200 400 600 800 Meters

Land Use	
Commercial	Residential
Institutional	Open Space
Industrial	Vacant

Table 3.6: Occupied Housing Units by Structural Type – Brampton CT

Structural Type	Units	Percent
Single detached houses	1,060	44.3
Semi-detached houses	145	6.1
Row houses	15	0.6
Apartment – duplex	75	3.1
Apartment – five or more storeys	755	31.5
Apartment – fewer than five storeys	340	14.2
Other single attached dwellings	10	0.4
Total	2,395	100

3.6.2 Guelph (CT 550000600)

The Guelph CT also includes the city's old downtown, but compared to Brampton's downtown, it is much more tightly drawn. The tract covers only 60 hectares, a third the size of the Brampton tract, and does not incorporate surrounding residential areas. The Guelph tract is about equally split between employment uses and ROW, each covering more than 40 percent of the tract area.

The amount of land in ROW derives from Guelph's unusual 1827 plan, and this proportion is by far the highest of any tract. Little of the tract is devoted to residential uses, open space, or vacant land. In combination with net employment densities that are among the highest studied, this pattern gives rise to relatively high gross employment density, at 94 jobs/ha.

With over 90 percent of housing units in the form of apartments, net residential densities are also high, at 335 people/ha. However, because there is so little residential land, gross population densities are only 27 people per hectare. This result illustrates a pattern of intensive but non-extensive residential uses, creating a very high net-to-gross population density ratio of 12.5.

Employment contributes most to the density of population plus employment, and both net and gross figures are in the top third of those tracts studied.

Table 3.7: Land Use – Guelph CT

	percent	hectares
Residential	8	4.8
Commercial	38.8	23.3
Institutional	2.7	1.6
ROW	42.5	25.6
Open Space	3.4	2
Vacant	4.6	2.8
Total	100	60.1

Table 3.8: Densities per Hectare – Guelph CT

Total Population	1,610
Total Jobs	5,670
Jobs/Population	3.5
Population Density	
Gross (change fm 1996)	27 (1.89)
Net	335
Gross/net	12.5
Employment Density	
Gross	94
Net	228
Gross/net	2.4
Population + Employment Density	
Gross	121
Net	245
Gross/net	2.0

Figure 3.2: Guelph Census Tract Land Use

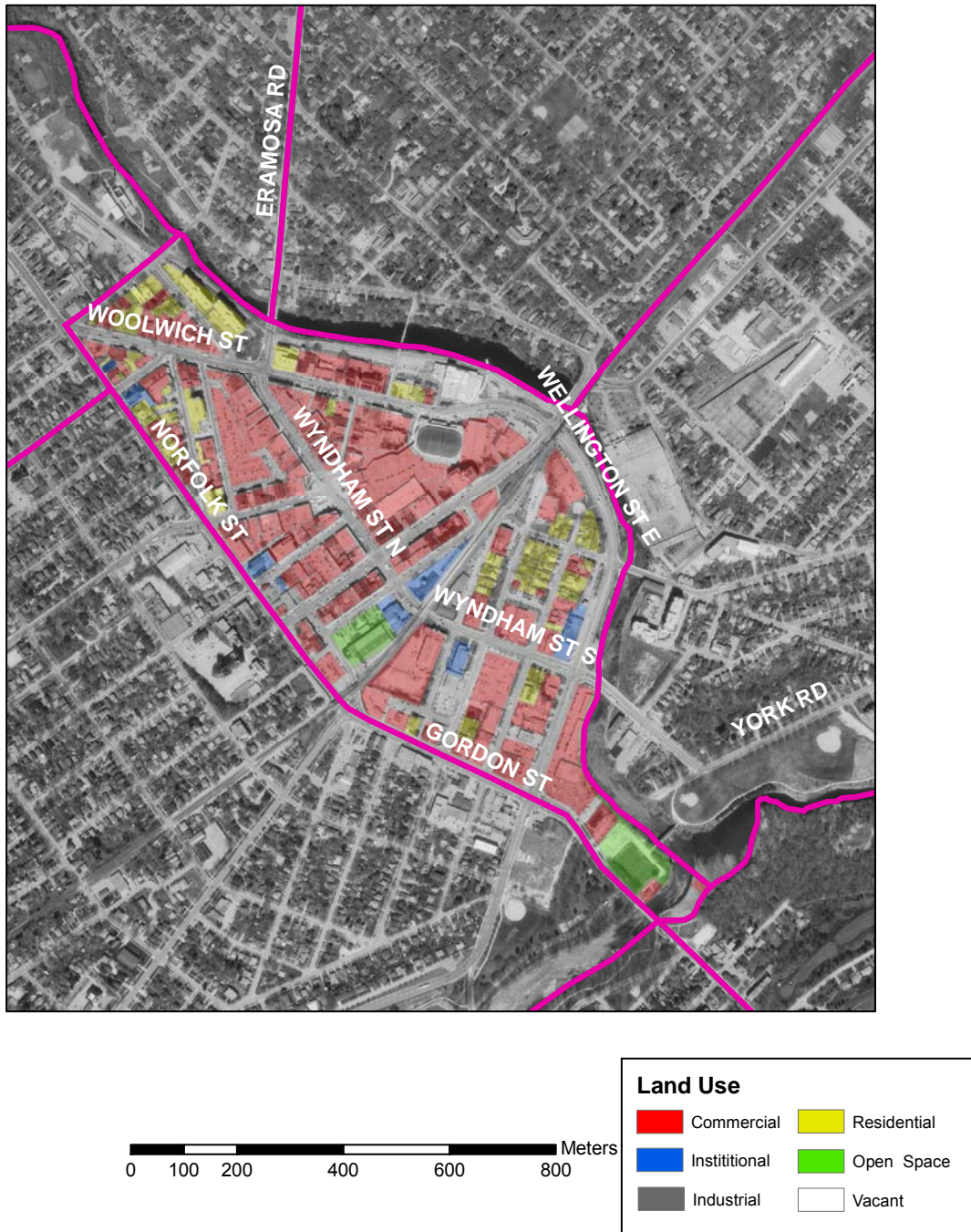


Table 3.9 Occupied Housing Units by Structural Type – Guelph CT

Structural Type	Units	Percent
Single detached houses	25	2.4
Semi-detached houses	25	2.4
Row houses	5	0.5
Apartment – duplex	30	2.9
Apartment – five or more storeys	515	49.8
Apartment – fewer than five storeys	440	42.5
Other single attached dwellings	0	0.0
Total	1,035	100.0

3.6.3 Hamilton (CT 537003700)

The CT covers just part of Hamilton's downtown area and is centred on the intersection of Bay and Main Streets. Data for this tract could be combined with data for tracts to the north to better capture the centre. The tract is very small, just 32 hectares. Employment land uses predominate, with 37 percent of the tract devoted to commercial uses, including part of the Hamilton Convention Centre, and another 22 percent to institutional uses, including City Hall. Despite the presence of extensive parking lots, gross and net employment densities – at 170 and 285 jobs/ha respectively – are quite high relative to the other tracts.

Since apartments make up 95 percent of the housing units, net residential population densities, at 618 people/ha, are almost twice as high as those in any other tract. Because of this intensity, gross population density, at 79 people/ha, is still higher than any other tract studied, although residential uses account for a small area of the tract.

Given the high population and employment densities, both gross and net densities for population-plus-employment/ha are much higher than those of any other tract studied. Further contributing to high gross densities is the complete absence of any open space or vacant land. However, the presence of large areas devoted to parking suggests that there is still room for intensification.

Table 3.10: Land Use – Hamilton CT

	percent	hectares
Residential	12.8	4.1
Commercial	37.2	11.8
Institutional	22.3	7
ROW	27.6	8.7
Open Space	0	0
Vacant	0	0
Total	100	

Table 3.11: Densities per Hectare – Hamilton CT

Total Population	2,503
Total Jobs	5,360
Jobs/Population	2.1
Population Density	
Gross (change fm 1996)	79
Net	618
Gross/net	7.8
Employment Density	
Gross	170
Net	285
Gross/net	1.7
Population + Employment Density	
Gross	249
Net	344
Gross/net	1.4

Figure 3.3: Hamilton Census Tract Land Use

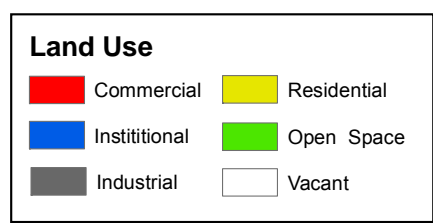
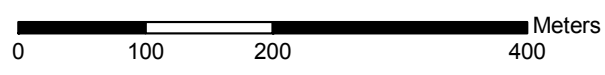
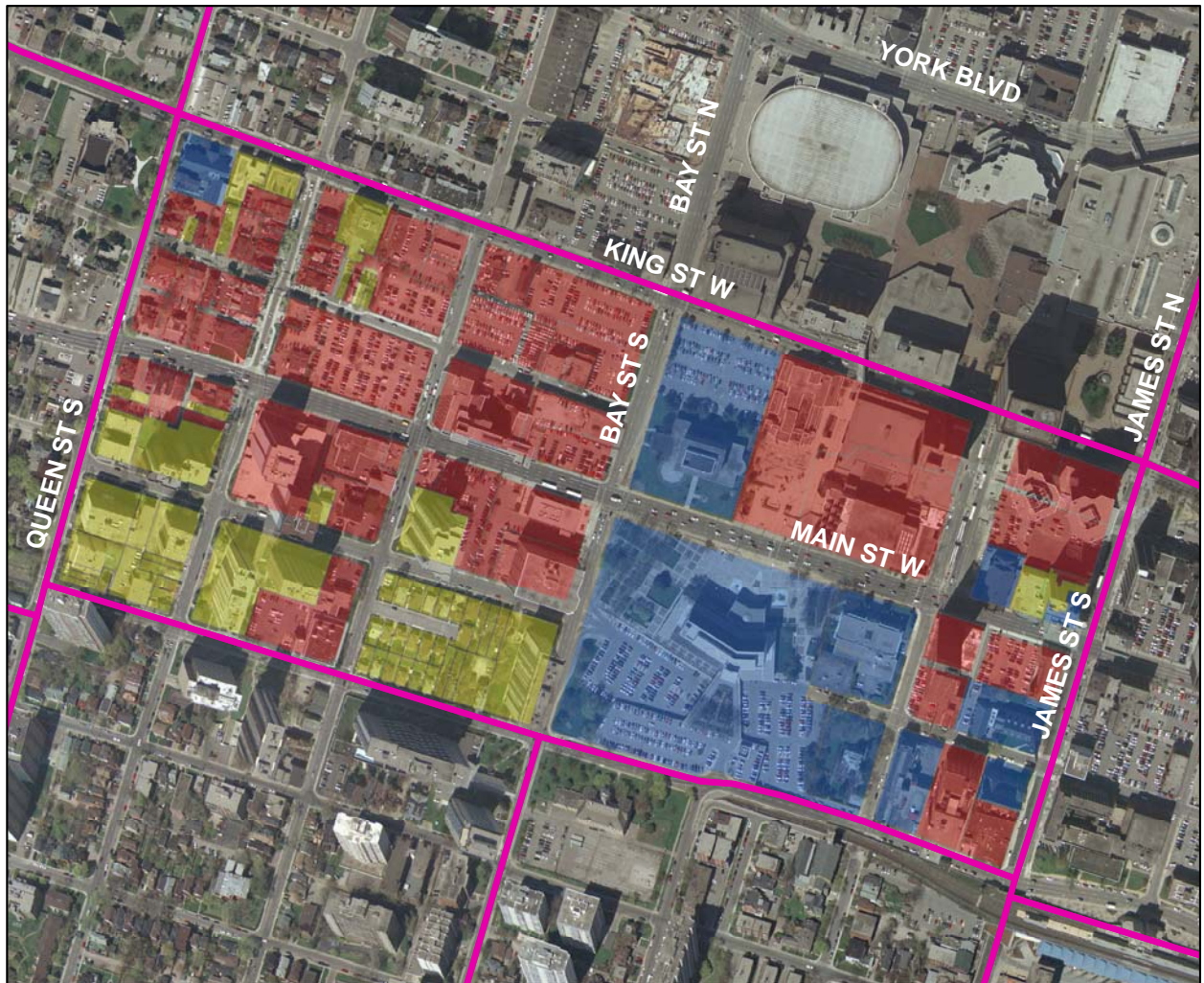


Table 3.12: Occupied Housing Units by Structural Type – Hamilton CT

Structural Type	Units	Percent
Single detached houses	30	1.6
Semi-detached houses	5	0.3
Row houses	10	0.5
Apartment – duplex	15	0.8
Apartment – five or more storeys	1,690	88.0
Apartment – fewer than five storeys	165	8.6
Other single attached dwellings	0	0.0
Total	1,920	100

3.6.4 Markham (CT 535040103)

This CT features a development pattern dating almost entirely from the postwar period. The tract is enormous, at almost 800 hectares, and unlike the previous tracts profiled, its boundaries are not defined around a recognizable centre or distinct area of development. The tract certainly does not capture the Markham City Centre planning area, a large part of which is to the west of Warden Avenue, in two other tracts. Also, most of the area is devoted to extensive but non-intensive residential and employment uses outside the Centre planning area, south of Highway 407.

Beyond its size, the Markham tract is remarkable for the large amount of vacant land – over 35 percent of the tract, or 278 hectares. Indeed, there is more vacant land in this tract than in the Barrie, Kitchener, and Guelph tracts combined. Most of the vacant land is in the planned centre, but because of limitations in the data, the figure also includes the Highway 407 ROW.

The remaining ROW makes up only 14 percent of the study area, a very low figure. Beyond the unaccounted-for Highway 407 ROW, this finding is explained by the undeveloped centre area, where ROWs have not yet been established and the very large block pattern south of Highway 407, where some blocks are more than 700 metres long.

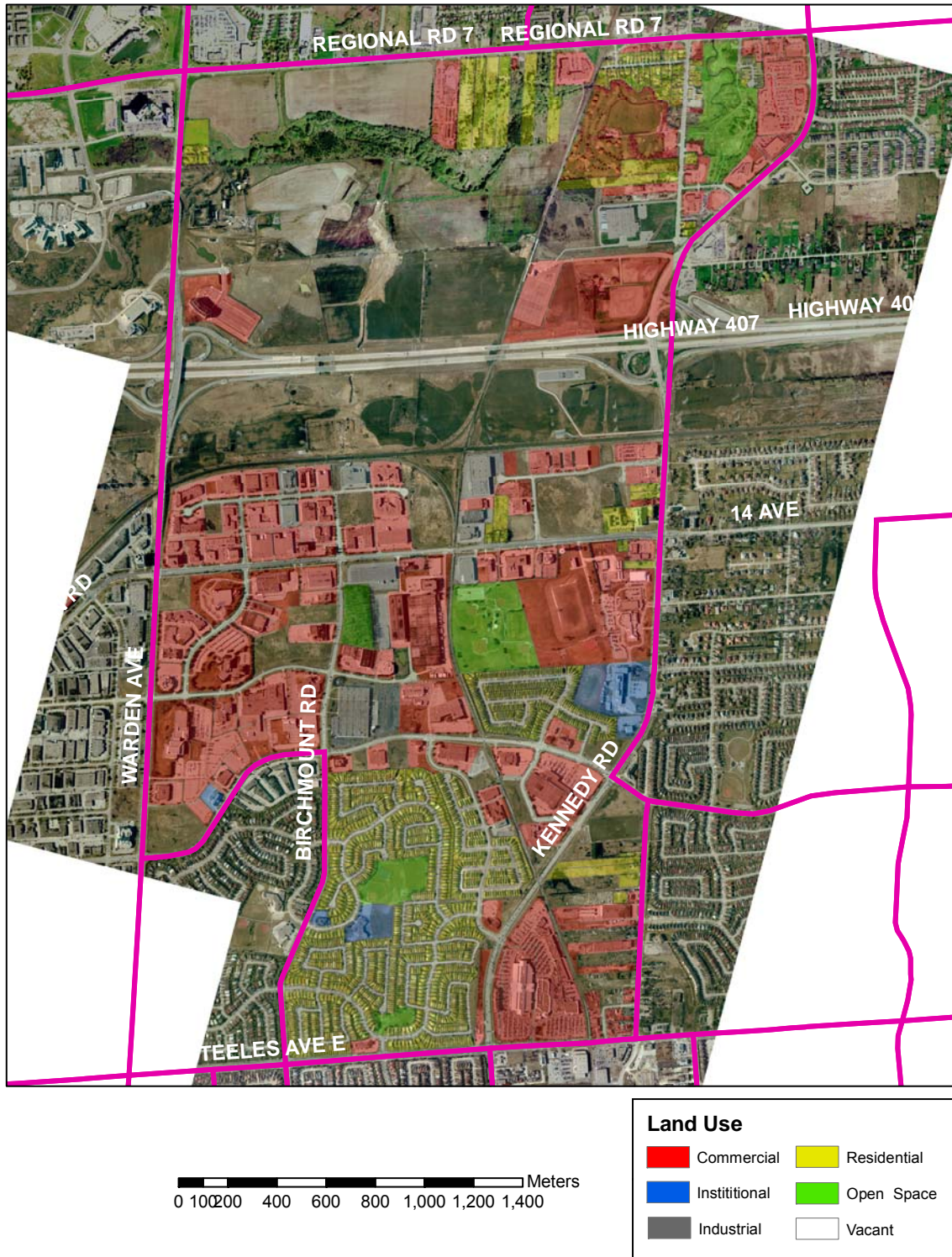
Table 3.13: Land Use – Markham CT

	percent	hectares
Residential	11.5	90.7
Commercial	34.3	271.1
Institutional	1.3	10.4
ROW	14	110.7
Open Space	3.8	29.8
Vacant	35.2	278.4
Total	100	791.1

Table 3.14: Densities per Hectare – Markham CT

Total Population	7,494
Total Jobs	14,765
Jobs/Population	2.0
Population Density	
Gross (change fm 1996)	9 (1.9)
Net	83
Gross/net	8.7
Employment Density	
Gross	19
Net	52
Gross/net	2.8
Population + Employment Density	
Gross	28
Net	60
Gross/net	2.1

Figure 3.4: Markham Census Tract Land Use



The proportion of commercial and residential land is similar to that in other centres, but because there are so few apartments and the tract contains a large low-rise employment district, net residential, commercial, and combined densities are very low. Markham has the lowest gross densities of all tracts studied.

Table 3.15: Occupied Housing Units by Structural Type – Markham CT

Structural Type	Units	Percent
Single detached houses	1,660	85.1
Semi-detached houses	5	0.3
Row houses	60	3.1
Apartment – duplex	0	0.0
Apartment – five or more storeys	75	3.8
Apartment – fewer than five storeys	140	7.2
Other single attached dwellings	0	0.0
Total	1,950	100

3.6.5 Scarborough (CT 535036303)

Scarborough is another CT that was developed in the postwar period. The tract lies between Highway 401 and Ellesmere Road. It does not contain areas that would be considered part of an Urban Growth Centre, such as the Scarborough Town Centre mall or the Scarborough Civic Centre, located just across McCowan Road to the west. At over 300 hectares, the tract is very large. It contains a wide array of land uses: office and apartment towers, single-family subdivisions, large educational campuses, low-rise commercial, warehousing, and industrial uses, and a substantial amount of open space. However, development in the tract is carefully laid out according to postwar planning principles, with large superblocks containing strictly segregated areas of land use.

Employment uses in the tract are extensive – more than 130 hectares are devoted to commercial and institutional land uses, or 45 percent of the tract. With the exception of a few parcels, however, employment uses are not intensive, so net densities are only 81 jobs/ha, the lowest figure of any tract other than Markham. Gross employment density is also low, at 37 jobs/ha. Only Brampton, where a relatively small area is devoted to employment, and the enormous Markham tract have lower figures.

Table 3.16: Land Use – Scarborough CT

	<i>percent</i>	<i>hectares</i>
Residential	11.4	35.3
Commercial	31.4	97.5
Institutional	14.2	44
ROW	20	62.2
Open Space	16.5	51.2
Vacant	6.5	20.1
Total	100	310.2

Population densities are much higher. Although only 11 percent of the tract is devoted to housing, 92 percent of units are in intensive high-rise housing forms. Net population densities are 282 people/ha; only Hamilton and Guelph have denser populations. At 32 people/ha, gross population densities are also in the top tier of tracts studied. Interestingly, between 1996 and 2001, gross population densities increased by almost 10 people/ha, an increase that is more than five times higher than that of any other tract profiled so far.

The combined population-and-employment density, as with all the tracts, is most affected by employment, and both gross and net figures are fairly low for the tracts studied, 69 and 122 people-plus-jobs/ha, respectively.

The Scarborough tract is unusual in that 16 percent of the area is devoted to open space, a higher proportion than in any other tract. On the other hand, only 20 percent of the land is devoted to ROW, including part of the Highway 401 ROW. This low proportion reflects the modernist, superblock street system in which some blocks are almost 800 metres long. At 6.5 percent of the tract, the proportion of vacant land is similar to many other tracts studied, but given the large tract area, this adds up to 20 hectares. The low intensity of much of the commercial uses suggests that intensification through redevelopment is possible.

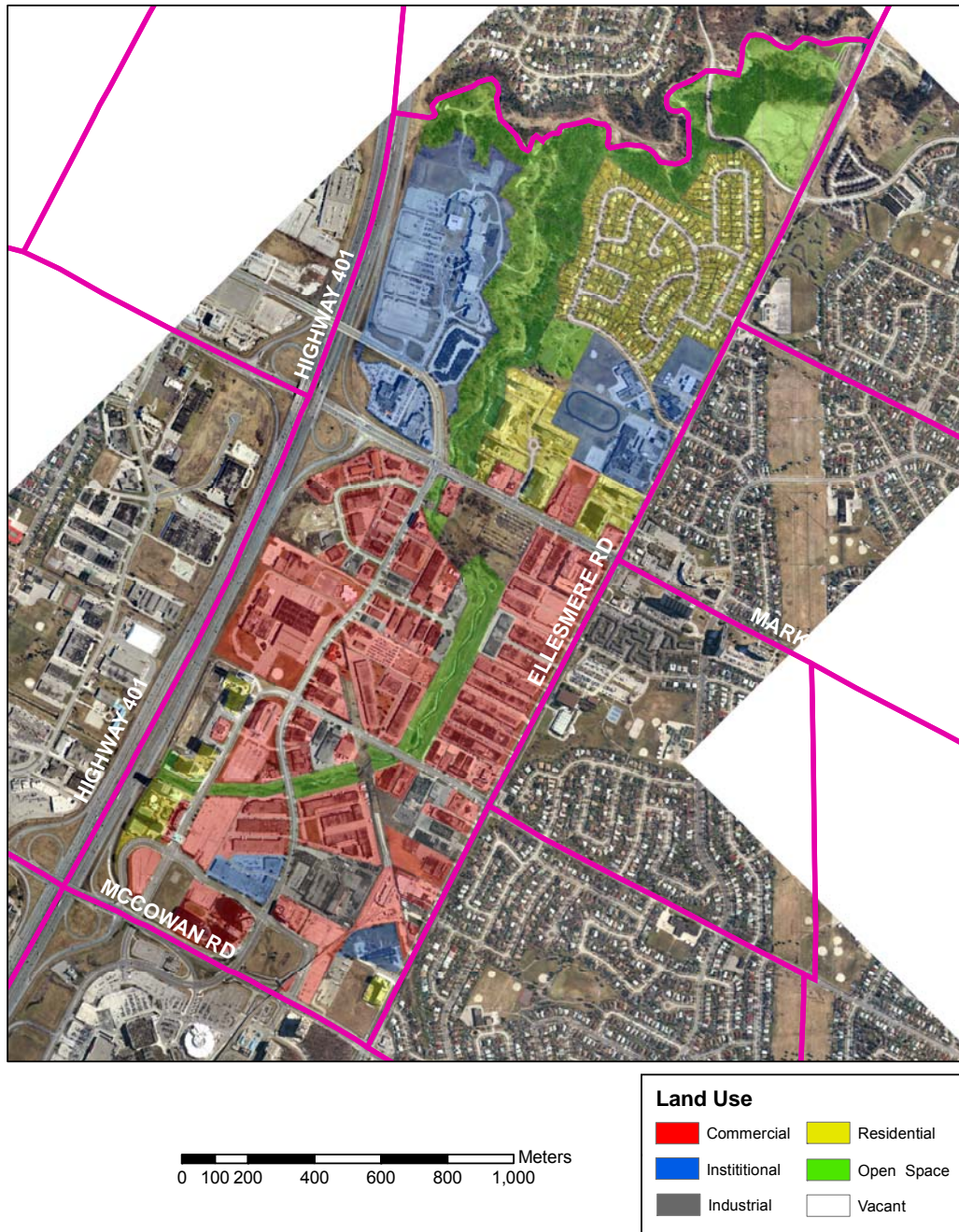
Table 3.17: Densities per Hectare – Scarborough CT

Total Population	9,968
Total Jobs	8,220
Jobs/Population	3.3
Population Density	
Gross (change fm 1996)	32 (9.7)
Net	282
Gross/net	3.2
Employment Density	
Gross	37
Net	81
Gross/net	2.2
Population + Employment Density	
Gross	69
Net	150
Gross/net	1.6

Table 3.18: Occupied Housing Units by Structural Type – Scarborough CT

Structural Type	Units	Percent
Single detached houses	295	7.6
Semi-detached houses	0	0.0
Row houses	0	0.0
Apartment – duplex	15	0.4
Apartment – five or more storeys	3,555	92.0
Apartment – fewer than five storeys	0	0.0
Other single attached dwellings	0	0.0
Total	3,865	100

Figure 3.5: Scarborough Census Tract Land Use



3.7 General Lessons From Census Tract Analysis

The boundaries of tracts with older downtowns are generally defined relative to the downtown. The boundaries for Barrie, Brampton, Guelph, Kitchener, Oshawa, and Waterloo also contain fairly well-defined commercial cores. Given reliable data, these tracts are adequate for tracking numbers of jobs in these centres. The exception is Hamilton, where the tract contains only a part of the downtown, but it could be combined with adjoining tracts to give a more complete picture.

Tract boundaries may be drawn tightly around the commercial core, as in the Guelph tract, or contain very large areas of housing surrounding the core, as in the Brampton tract. This type of variation makes straightforward comparisons of gross densities, whether population, employment, or both together, very difficult. Different boundary definitions will change the mix of residential and employment lands and affect density figures, regardless of the intensity of either use. For example, including more detached housing around a centre may or may not decrease gross population densities, but will certainly decrease gross employment densities. The combined figure is also likely to be lower.

Unlike tracts around older downtowns, tracts containing postwar development are not defined with respect to employment centres. The tract boundaries for Mississauga and Scarborough do not include all the commercial or residential uses that could reasonably be considered part of these centres, but do include large areas of land that are really outside the centres, in part because, unlike the older downtowns, the boundaries of these tracts predate the development of the centre. Also, these postwar centres are more spread out and can be very difficult to define as distinct places. Markham is the extreme case, as the centre is planned, but not yet developed. For all these reasons, it is hard to compare densities among tracts, whether population, employment, or the combination of both. When tract boundaries are defined independently from development patterns, resulting density measurements are largely arbitrary.