

APPENDIX A

Relationship Between Density Measures

- net residential density
- gross residential density

Relationship Between Density and Housing Mix

Capacity Housing Mix and Density by Secondary Plan Area

Relationship Between Density Measures

From the definitions and illustrations of Figures 1 and 2, it is apparent that Net Density and Gross Density can be related if the ratio of road, buffer and walkway acres to total gross residential acres is known or can be reasonably estimated.

In moderate density residential areas of several hundred acres, a reasonable assumption is that roads etc. amount to 29% of the Gross Residential Area, and conversely, Net Residential Area equals 71% of the Gross Residential Area. Thus, in most cases, the following equation provides a reasonable approximation:

$$\text{Gross Density} = 0.71 \times \text{Net Density}$$

In practice, the proportion of roads, buffers and walkways might vary from 27% to 33% of the Gross Residential Area. Areas in which publicly owned buffers are used extensively would have an extra one or two percent of the Gross Residential Area devoted to roads, buffers and walkways. Therefore, the factor of 0.71 in the above formula would typically vary from 0.67 to 0.73 depending on the type of road pattern, the extent of the use of public buffers, etc.

Figure 1

DEFINITION OF NET RESIDENTIAL DENSITY
(UNITS/NET ACRE OR HECTARE)

Net Residential Density means the number of dwelling units per acre or hectare of Net Residential Area.

Net Residential Area means an area consisting of one or more surveyed and registered lots, the principal use of which is for dwellings.

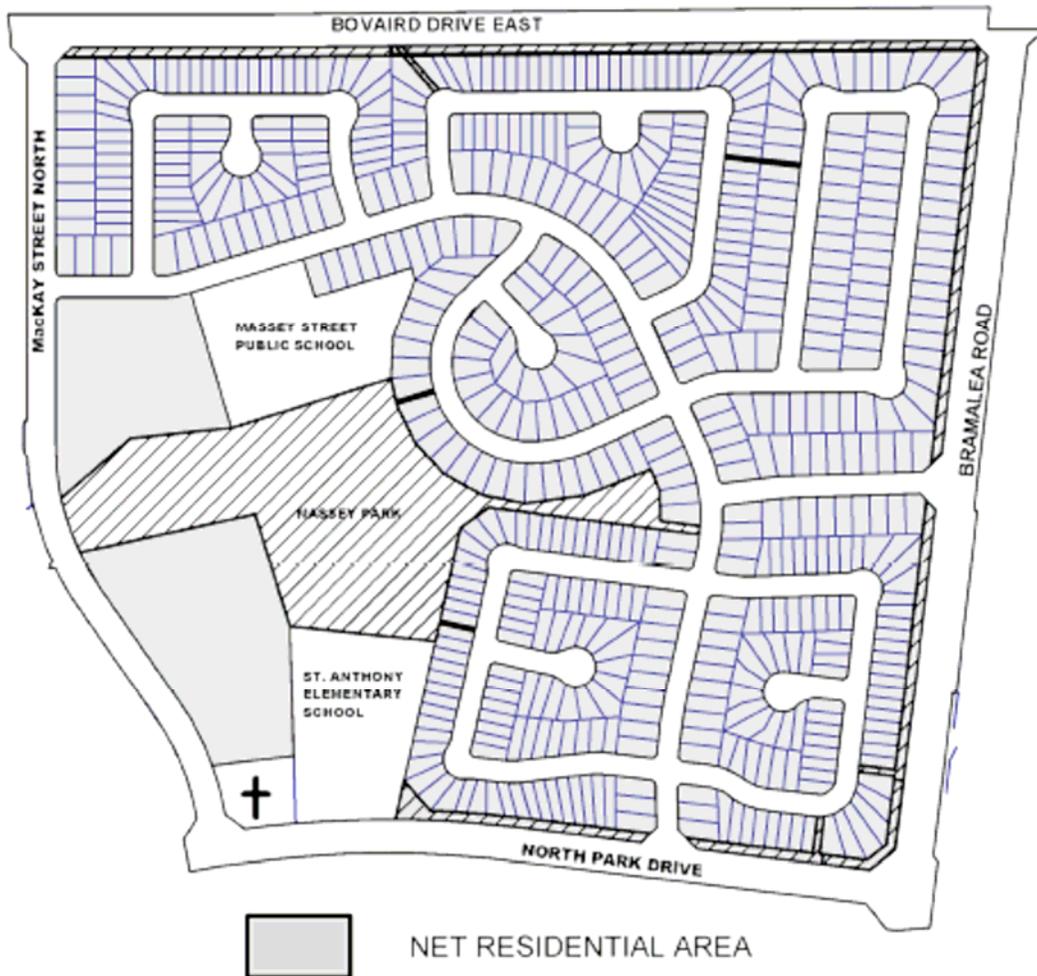
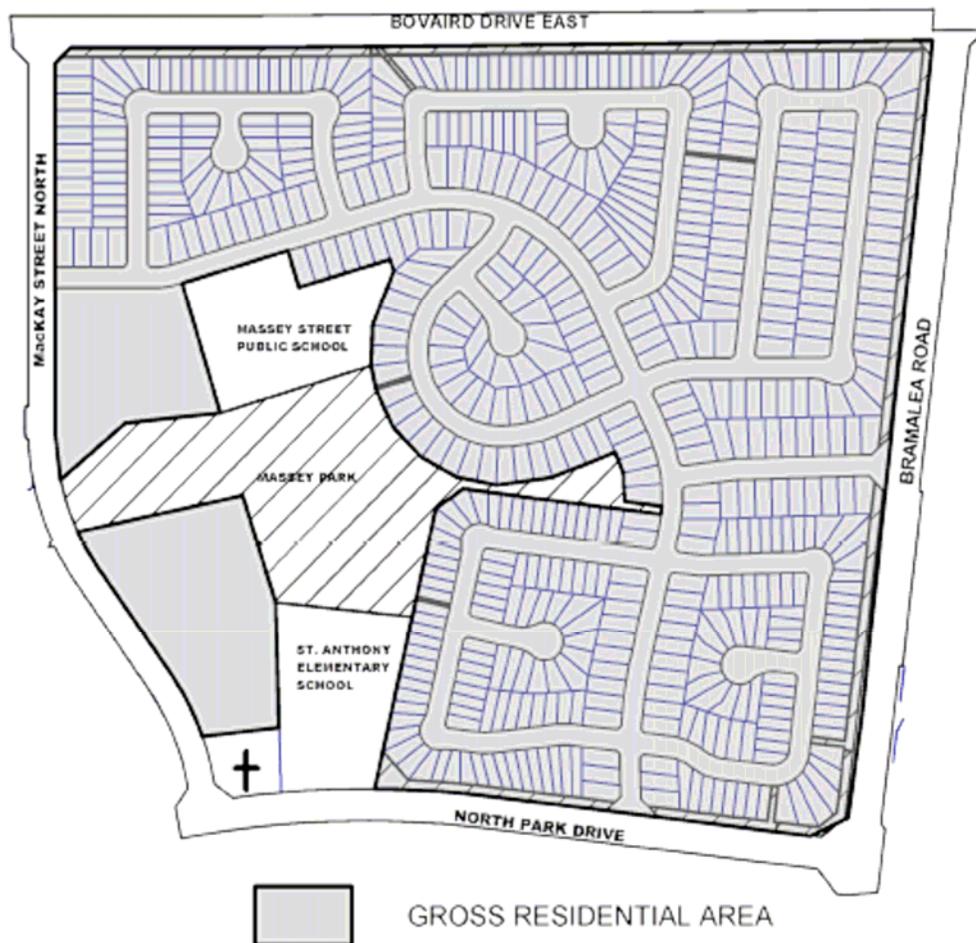


Figure 2

DEFINITION OF GROSS RESIDENTIAL DENSITY
(UNITS/GROSS ACRE OR HECTARE)

Gross Residential Density means the number of dwelling units per acre or hectare of Gross Residential Area.

Gross Residential Area means an area consisting of one or more surveyed and registered lots, the principal use of which is for dwellings, together with abutting buffer strips and walkways, plus those portions of all abutting Local and Collector roads that are contained between the boundaries of the lot or lots extended and the centre-line of the roads.



Density Measures Related to Housing Mix

A housing mix applicable to a defined area can be expressed as the percentage of the total dwelling units represented by each distinct (in term of density) housing type. Some of these percentages might be expressed as ranges to provide flexibility. Housing types that are similar in terms of density might be grouped into a single category. The following are two examples of housing mix specifications:

<i>SPECIFIC</i>		<i>FLEXIBLE</i>	
20 %	4,000 sq.ft. * Singles	20-40%	Singles
30%	3,000 sq.ft. * Semi-Detached	20-40%	Semi & Link Townhouse
35%	2,100 sq.ft. * Townhouse	15-35%	Zero Lot Line & Townhouses
15%	1,000 sq.ft. * Apartments	15-20%	Stacked Townhouses & Apartments
100%		100%	

* *Minimum lot area per unit*

A specific housing mix can be directly related to an equivalent Net Density or Gross Density. A more flexible specification would be equivalent to a density range.

A specific housing mix such as the one above can be converted to a Net Density and a Gross Density by using the following equations:

$$\text{Net Density (units per acre/hectare)} = \frac{1}{1.125 \times \text{Sum of } \left(\frac{\text{percentage of each type}}{100} \times \text{min lot size in acres/hectares} \right)}$$

$$\text{Gross Density} = 0.71\% \times \text{Net Density}$$

In the first equation, the number 1.125 is a correction factor to account for the fact that actual lot sizes will average approximately 12.5% larger than the minimum lot sizes because of the unavoidable use of larger lots abutting flanking streets, along cul-de-sacs and crescents, etc. The second equation is previously explained.

Although there is a unique density equivalent for any fully specific housing mix, there are any number of housing mixes associated with a given density figure.

Although the density does not completely determine the housing mix, it certainly sets some practical limits to the range of possibilities. A combination of a flexible housing mix specification and a maximum density target would set even stricter limits on the range of possibilities.

**INCREASING DENSITY/DECREASING LOT SIZE
NOMINAL LOT SIZE PER UNIT (SQUARE METRES)**

