

Increasing Suburban Densities Adapting the Suburban Pattern

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Increasing Suburban Densities: Adapting the Suburban Pattern

Introduction

This paper was prepared with the support of the CMHC for the Future of the Suburbs Conference, held at York University, November 14 and 16, 1981, by Kevin Garland, M.Sc.Pl., Associate Planner, and André Lessard, B.Arch., Senior Architect, A.J. Diamond Planners Ltd.

In North America, following the Second World War, and continuing into the 1970's, there has been extensive new residential construction to fill the housing demand created initially by the returning war veterans and the undoubling of families following the Depression, and subsequently by the large numbers of young families who were the parents of the baby boom generation.

The pattern of this new suburban residential development was distinctly different from the previous urban pattern. Housing built between the late 1800's and World War II followed the traditional grid street pattern with two and three storey houses on narrow, deep lots. There was very little change initially to accommodate the automobile. Parking was achieved through the use of rear lanes, or with driveways from the street to rear garages. Shopping occurred in small increments of linear commercial development on arterial streets which could be easily reached on foot.

The post war suburban pattern differs dramatically from this model. The street pattern is one of curved streets and cul-de-sacs within a major arterial grid at the scale of the super-block. Lots are wide and shallow with a house form which spreads over the lot in low-rise form, and presents its widest dimension to the street. Parking occurs in front of the house with a wide driveway and garage, leaving the shallow back garden free for use as living space. Shopping, schools and churches are grouped at the centre of each neighbourhood with ample parking and in a location which requires the use of the car for most shopping trips.

This pattern of suburban development has continued to the present. Only recently have land costs risen to the point where lot widths are again decreasing to sizes more in keeping with the 25-30 foot dimensions of the pre-war period. The pattern of wide curving streets, wide lots and low spreading houses has come under considerable criticism,

almost from its inception. It produces a strict homogeneity of family type and income groupings. It places a heavy reliance on the private car and is impossible to service economically with public transit. It has been seen to be highly wasteful of urban land and of hard and soft services, due to its low densities.

The distinctive suburban pattern developed in the post-war years as a result of a number of influences. In the late nineteenth and early twentieth century there was a utopian stream of thought in town planning and architecture which reacted against the city, and sought to bring the urban dweller closer to nature; grass, trees and open space. In England, Ebenezer Howard's Garden Cities of Tomorrow laid the groundwork for British New Town Planning which continued into the late sixties and which embodied the elements of the suburban land use pattern. In North America perhaps the most influential spokesman for these ideas was Frank Lloyd Wright. Wright's vision was expressed in his design for Broadacre City in which housing is completely decentralized with a minimum of one acre of land for each family. His view of the densely built city of the first half of the century is one which borders on revulsion.

The emphasis of the planning theories of Howard, Wright and their followers was on bringing man closer to nature, with open space, fresh air, natural building materials and individual control over property.

Coupled with these planning theories was the housing shortage brought about by the war and increased demand for family housing. The form of housing that developed, which emphasised the impressive nature of the house on the street, the garden, the close relationship of house to open space within a carefully planned neighbourhood unit, may have represented the need for a stable family life and nurturing environment following the shattering period of the war years. Around the edges of every North American city there was rapid development of a housing form which was implicitly based on assumptions about the continuation of the nuclear family with a single wage earner as head, continued prosperity and rising incomes, high levels of car ownership and cheap energy costs. The suburban community was marketed as a package which included a highly family-oriented life style and social status all wrapped in the single investment in the family house.

Clearly the assumptions upon which the suburban pattern is founded are no longer valid:

- While the nuclear family still exists, there are many other household types in the suburbs, including the single parent family, the extended immigrant family, groups of unrelated adults and the elderly "empty-nesters" who have grown old in the suburbs.
- The average family can no longer afford a single family urban house without two incomes.
- The single income family is no longer the norm; The participation rate of women in the labour force has been growing steadily through the 1970's and shows no evidence of levelling off. In Metropolitan Toronto suburban women have higher participation rates in the labour force than women in the central area.(1)
- The period of rising prosperity, stable employment and rising incomes which characterized the post war period has ended for the majority of the population. A study undertaken in the suburban municipality of Peel found that between 1976 and 1977 the two income family experienced a 10% decrease in disposable income after essential household expenses were met.(2) The Federal Department of Finance predicts that average real wages across the country will decline in 1982 for the fifth straight year.
- Rising fuel costs have made the costs of owning and operating a car increasingly a major part of the family's annual living expenses. Long commuting distances are a real and increasing financial burden.
- The costs of services to provide the necessary infrastructure for low density development are escalating while the tax base has stabilized or is decreasing. This is particularly true of transit services which are both labour and fuel intensive, are increasingly necessary to the suburban resident and yet are uneconomic at low densities and in winding street patterns.

In summary the suburb requires a means of adaptation to changed social and economic conditions. While it is still very strongly an environment for families, the needs of families have changed and diversified. Falling birth rates and increasing numbers of elderly are producing smaller households which may need smaller housing units. The elderly couple on a fixed income with no children may wish to create a rental unit to increase their income. The working wife is no longer available to care for a large house, to drive the children to school and recreation, or to drive to shopping during the week.

The object of this study is to examine and evaluate methods of adapting the pattern of suburban development to higher densities and to a more diverse range of households, life styles and income groups. The focus of the study is on small units of incremental change at a scale which can be undertaken by the individual owner or small developer. It is at this scale that some of the most effective and pervasive changes in the fabric of a city are made. There is a perception that the suburban pattern is less amenable to this kind of adaptation than the older pattern of the inner city. Consequently typical house forms and lot layouts for an older suburb (1950's) and a suburb currently under development (1979-81) have been examined to illustrate methods of densification which involve subdivision of the individual house, or of a small assembly of lots or part lots.

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- 1 Metro's Suburbs in Transition Part I, Evolution and Overview, April 1979, Social Planning Council of Metropolitan Toronto, p. 159
 - 2 Ibid, p. 157

II Densification of the Suburb

Two suburban development case studies have been selected which represent the development pattern of the early 1950's (Don Mills), and the later pattern of the 1970's and 1980's (Erin Mills).

Don Mills: The 1950's Suburb

Don Mills is a planned community of roughly 2,000 acres on the northeast edge of Toronto, built in the early 1950's. The community was developed on a principle of four neighbourhood units, each unit centred on an elementary school, the four grouped around a regional shopping centre, a high school, post office and library. The second important planning principle was the separation of pedestrian and vehicular traffic. The street system was hierarchical, with two major arterials (elements of the Metropolitan grid system) crossing in the centre of the development. A major ring road separated the regional centre from the four residential neighbourhoods. All local roads were designed to make through traffic movements impossible and to direct major traffic flows to the arterial streets. An extensive pedestrian walkway system runs through the project leading to the elementary school in each neighbourhood, and to the regional shopping centre.

Housing form in Don Mills is distinctive and gives the community its particular look and feel. The development company set up an architectural committee, which approved all house designs. The houses were designed by some of Toronto's leading architects of the time, including James Murray, Henry Fliess and Douglas Lee. The designs were distinctively "modern" in style, low-rise, carefully sited on the lot, with materials and colours and landscaping all determined by an in-house consulting staff. The single family houses are relatively small (1,000 - 1,500 square feet) with living areas typically closely related to outdoor terraces. In a dramatic departure from the Victorian housing pattern, their widest dimension always faces the street.

The following illustrations show a small area of Don Mills directly south of Lawrence Avenue. This street with approximately twenty-five houses is typical of single family suburban housing of the 1950's and 60's. Lots are 60 feet wide and 100 feet deep - significantly wider and shallower than the more standard 40' x 125' dimension.

Figure 1 shows the street as it might have looked immediately following construction. Figure 2 shows the street as it is today - twenty-five years later. Trees and shrubs planted at random over the years by individual home owners have grown to maturity, creating a very attractive residential neighbourhood with an informal open, almost small town character.

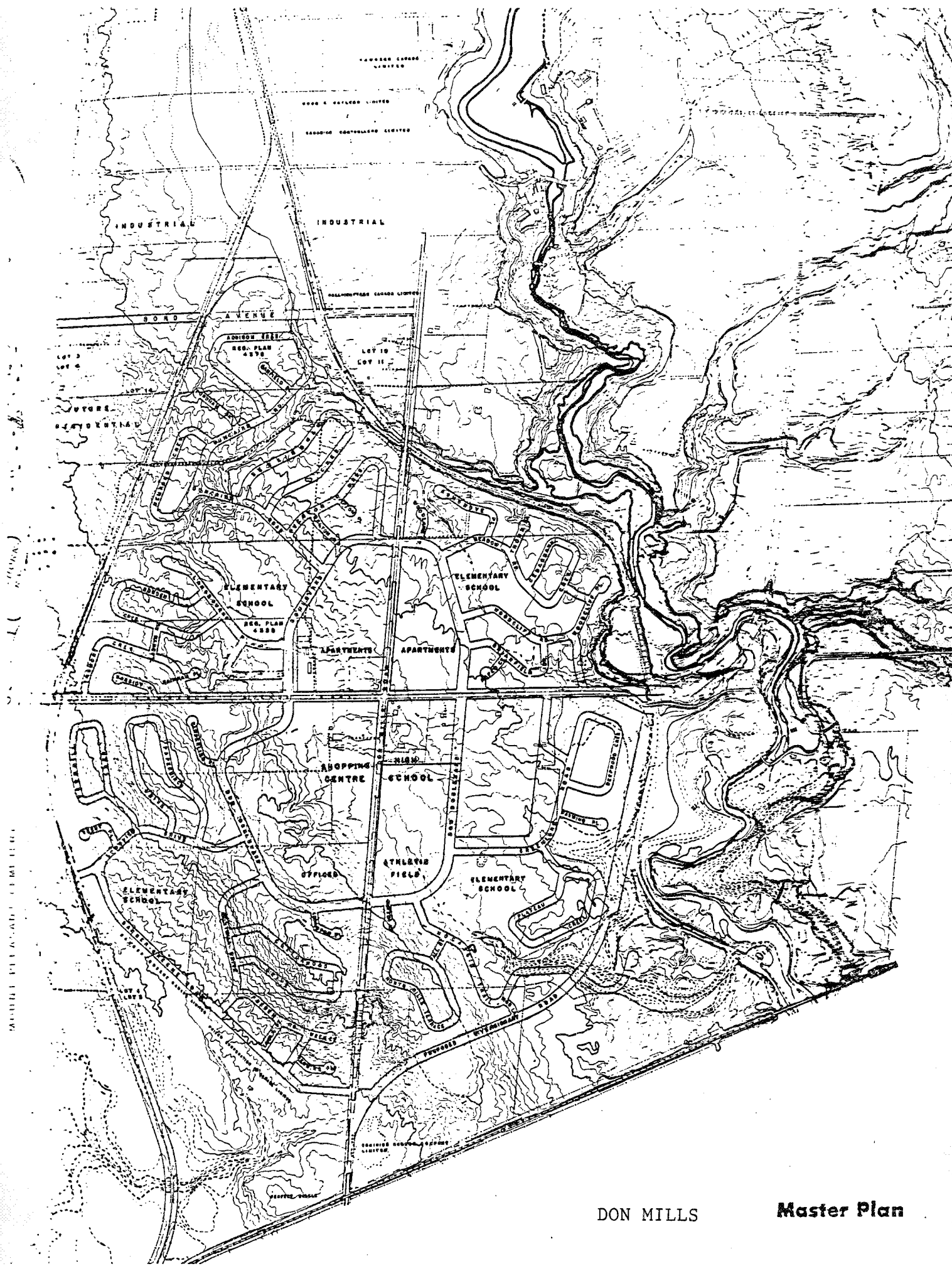
Figures 3, 3a, 4 and 4a illustrate two methods of adapting these typical single family houses to create a two family unit.

Figures 3 and 3a show a one storey, three bedroom unit of 1440 square feet which has had a new partial second storey added to create 2,250 square feet: a two bedroom unit of 1,050 square feet at grade and a two bedroom unit of 1,200 square feet on two floors. There is sufficient parking for two cars with one in the garage and a second in the driveway. Alternatively a second paved parking space could be added in the front garden, leaving an ample 35-40 feet of unpaved front garden space. The perspective views of the house before and after its renovation show that a second unit can be created without disrupting the scale and appearance of the building.

Figure 4 shows a single storey three bedroom unit of 1,400 square feet which is on a corner lot. Because the house faces two streets it can be readily converted into a two family house with horizontal extensions at the front and the rear. Figure 4a shows one of several ways in which such a conversion can occur. The front addition creates a two bedroom unit with separate living and dining rooms of 1,470 square feet. This unit has its living area opening onto an outdoor terrace which is enclosed by a garden wall, giving it privacy from the street. The rear addition creates a two bedroom unit of 1,000 square feet. The existing side drive is carried through to the back to give access and parking to the rear unit.

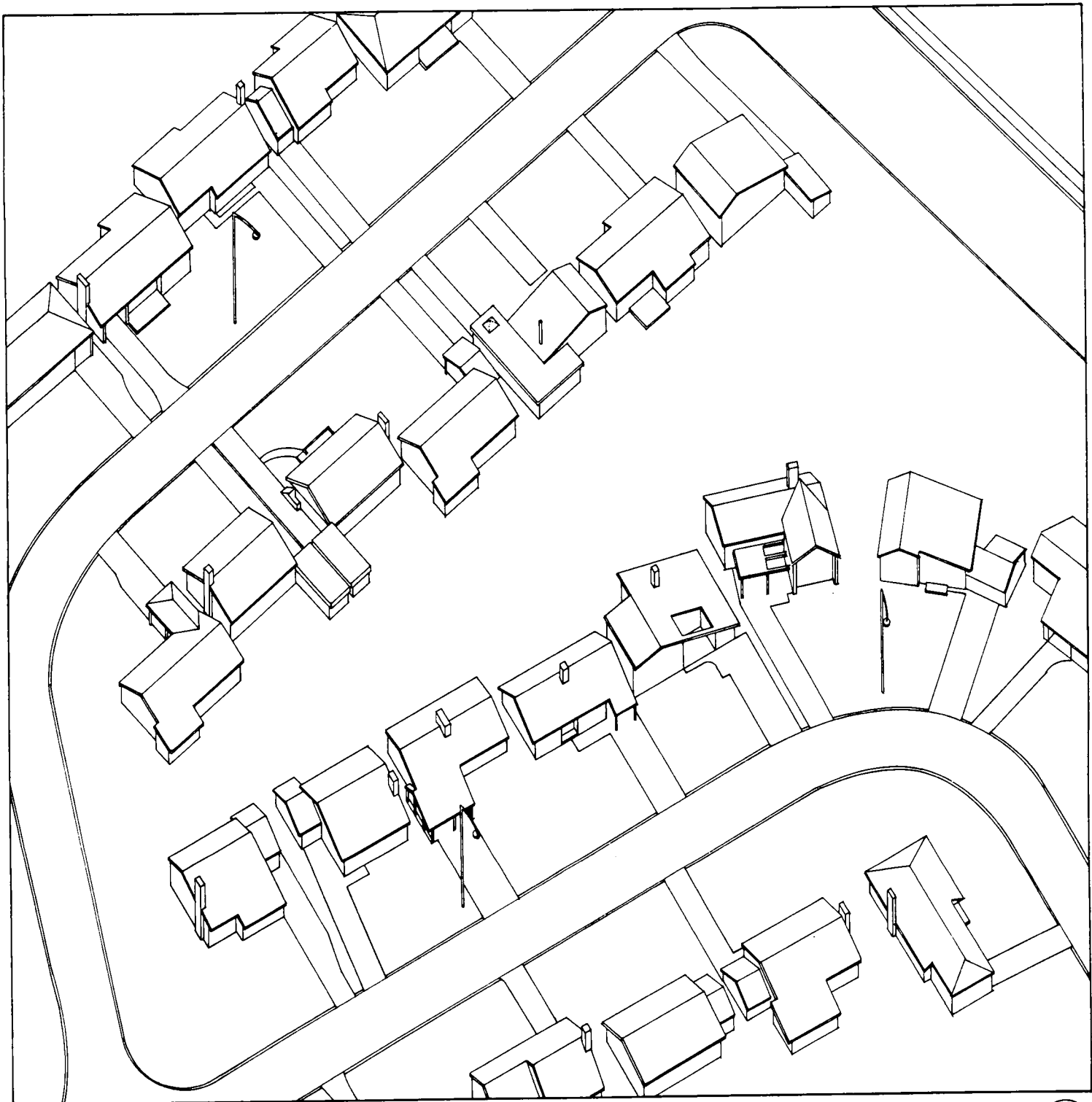
Figure 5 shows the Don Mills street as it might look with several houses on the street renovated to create two family dwellings. At one end of the street, where the lots back onto the major arterial, it is assumed that a small developer has assembled two properties, demolished the houses, and created a small six unit townhouse development. Again the townhouse units can be created without seriously disturbing the scale and character of the street. Parking for the units is accommodated in a garage at the side of the lot.

Presently the street as shown in Figure 2 contains 25 single family units. Assuming an average of 3.4 persons per unit, this small area may house approximately 85 people. If every second unit were to be renovated as illustrated in Figures 3 and 4, and with the addition of the small townhouse infill project, the total number of housing units would be 40. Assuming that the new smaller units would contain smaller households at an average of 2.5 persons per unit, the area could now house roughly 110 people. Thus the housing density has risen by 60%, while the population density has risen by 29%.



DON MILLS

Master Plan



DON MILLS *as built (1954)*

FIGURE 1

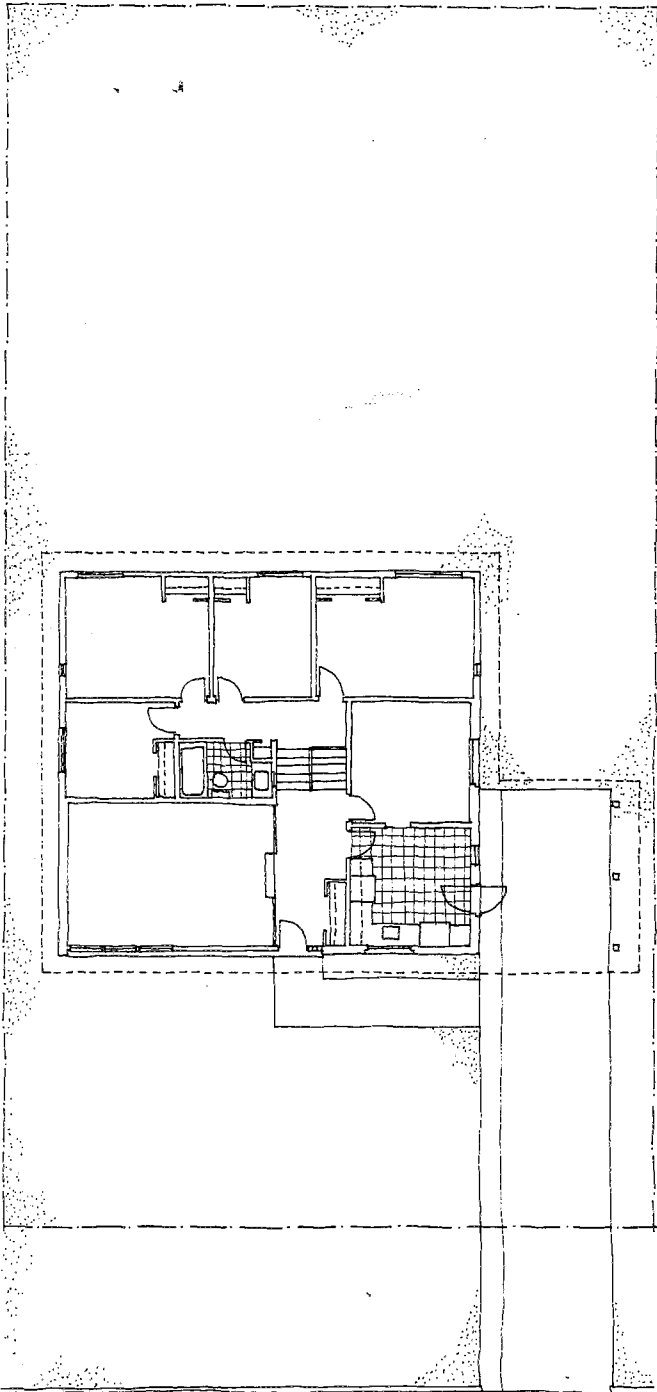
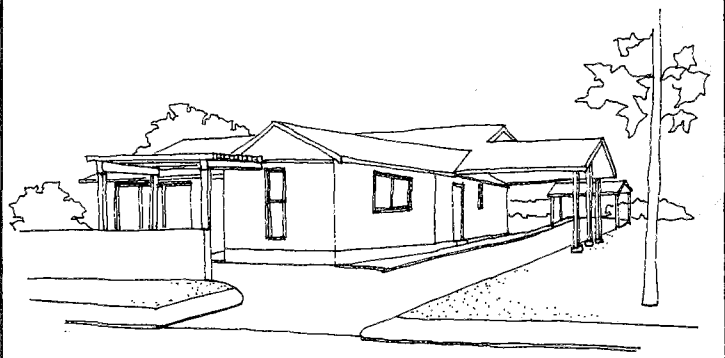
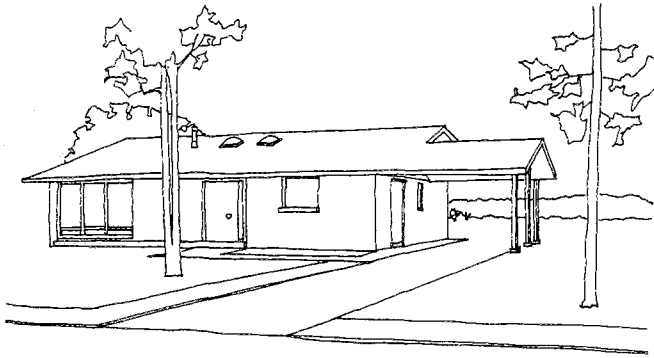


0 50 100 ft.

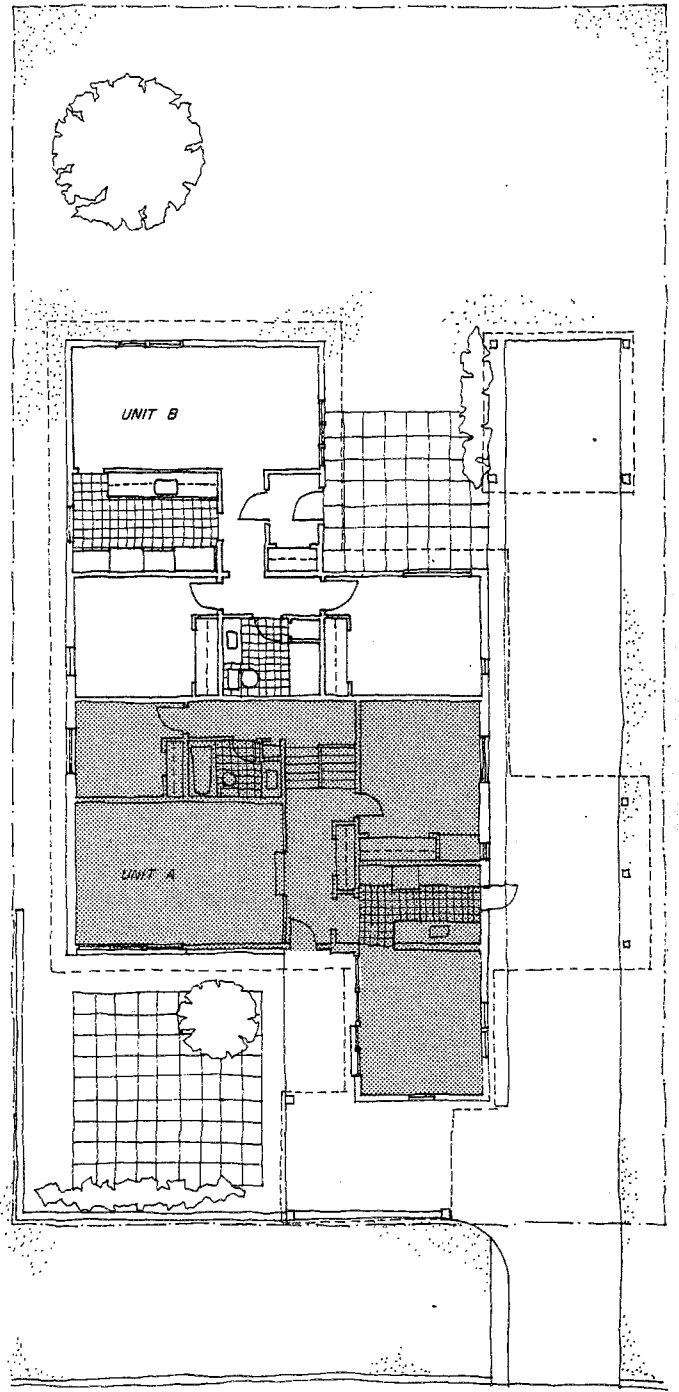


DON MILLS *existing (1981)*

FIGURE 2



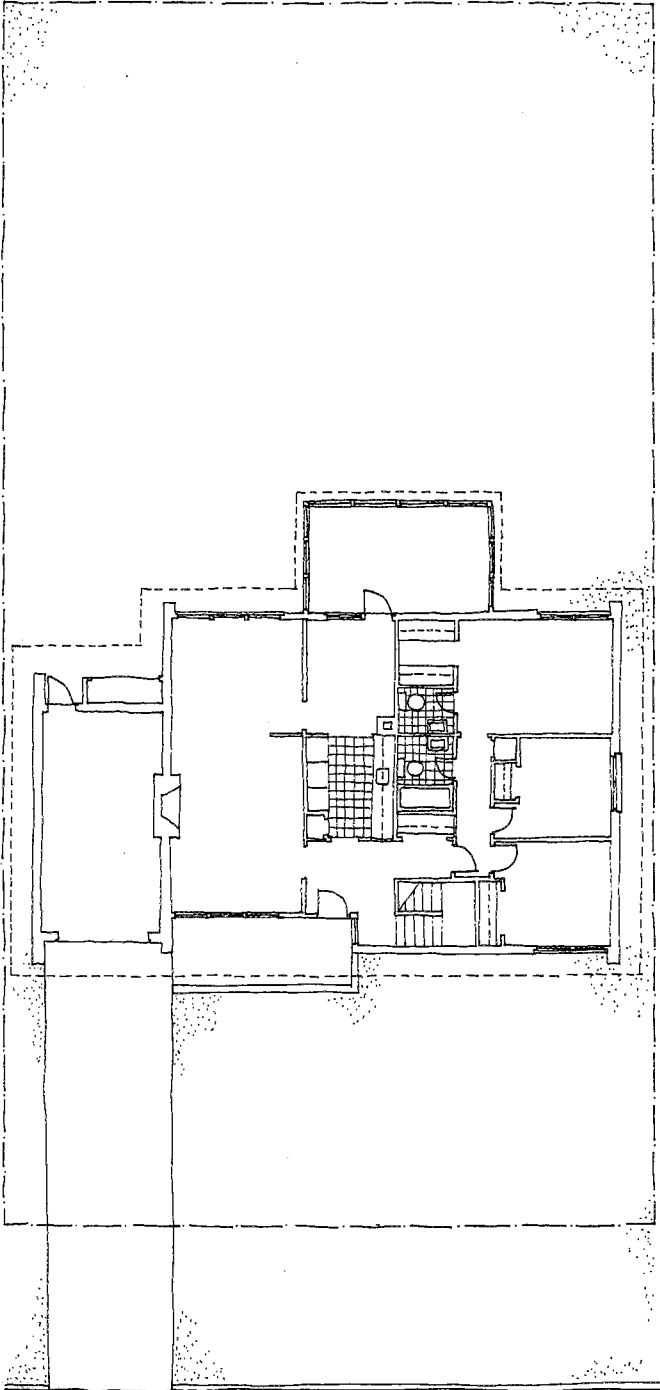
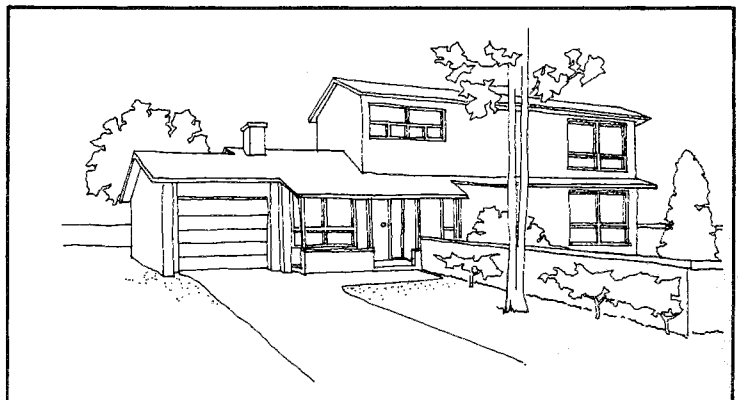
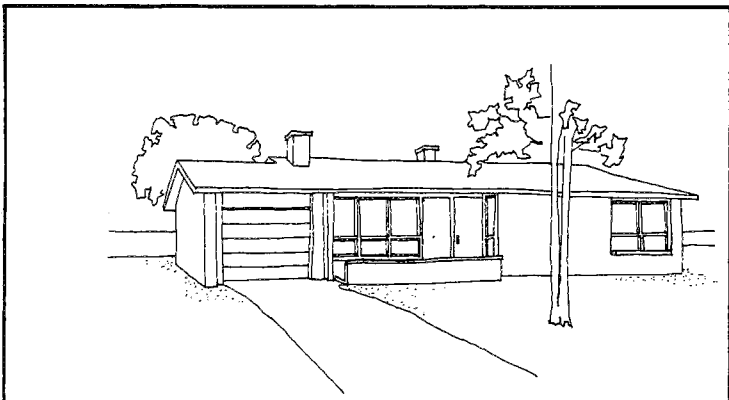
GROUND FLOOR PLAN - EXISTING



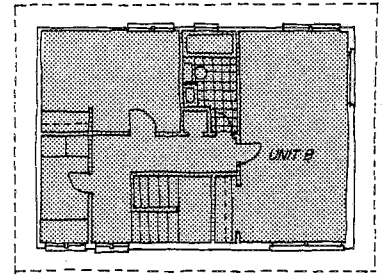
GROUND FLOOR PLAN - CONVERSION TO TWO UNITS

FIGURE 4

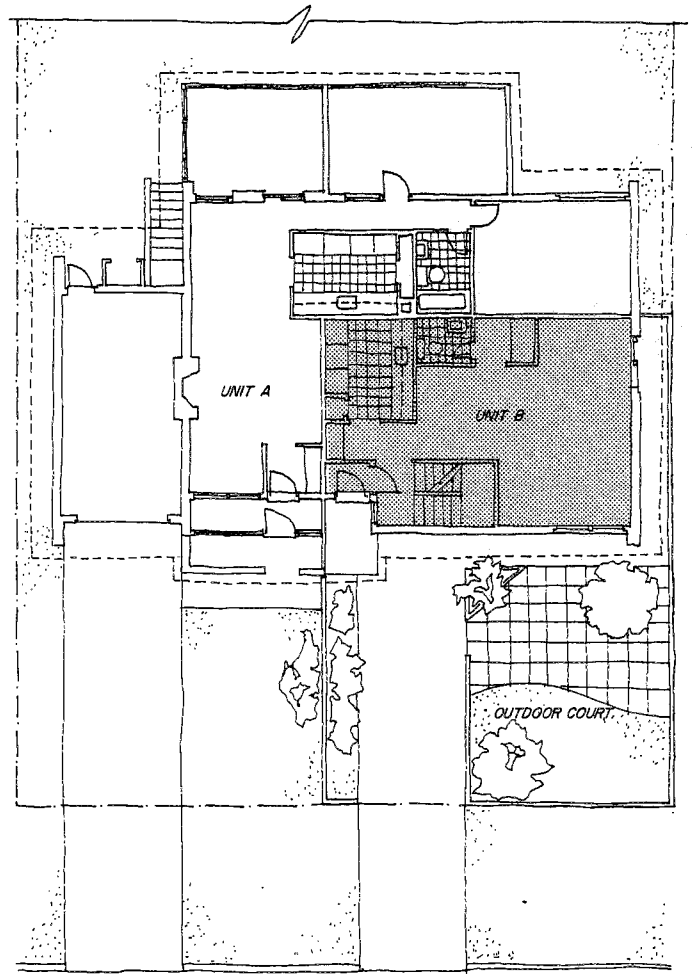
FIGURE 4a



GROUND FLOOR PLAN - EXISTING



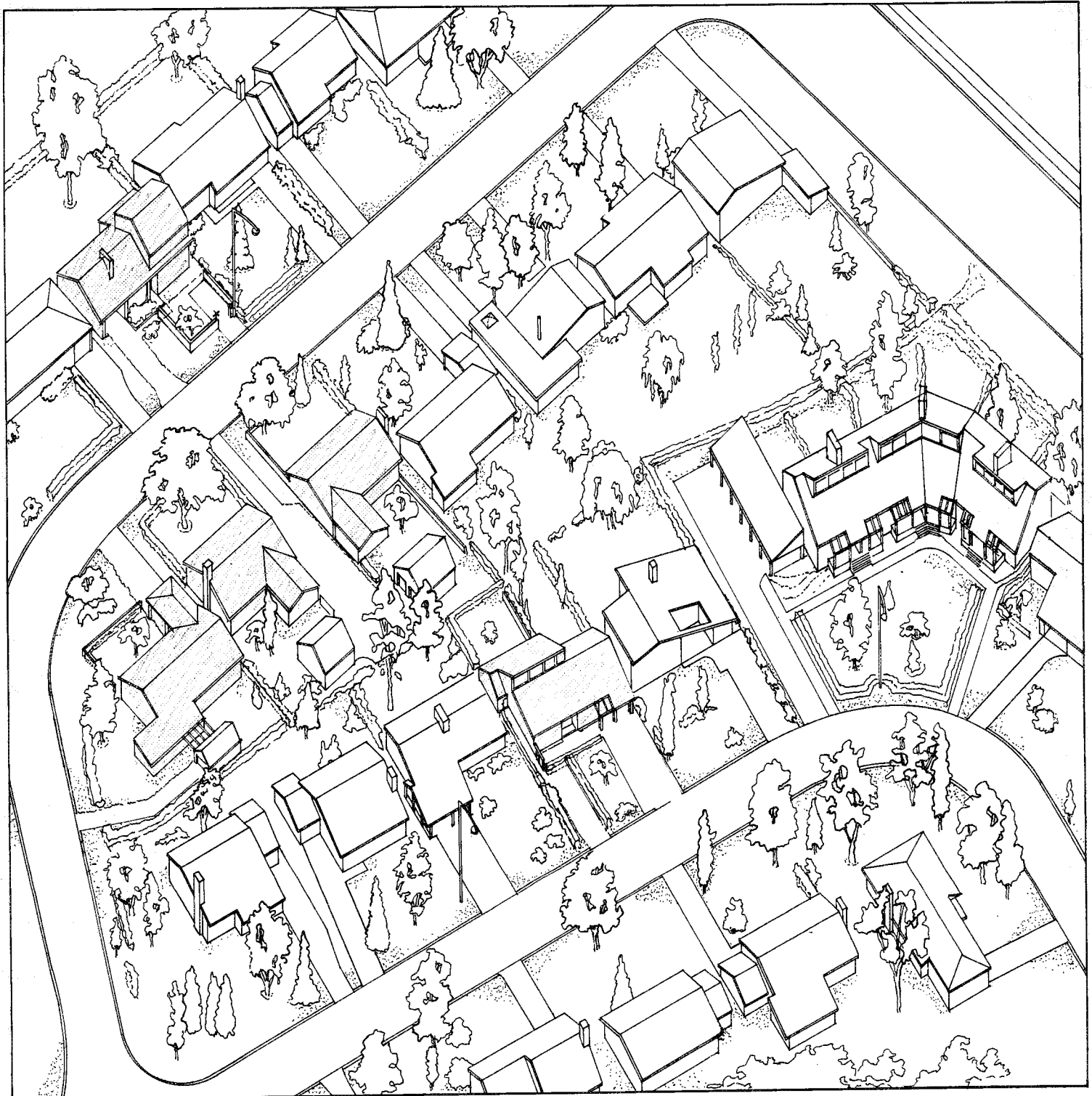
SECOND FLOOR PLAN



GROUND FLOOR PLAN - CONVERSION TO TWO UNITS

FIGURE 3

FIGURE 3a



0 50 100 ft.

DON MILLS *adaptation*

FIGURE 5

Erin Mills: The 1970's Suburbs

Like Don Mills, Erin Mills is a planned community, based on the neighbourhood unit of 1,500 to 1,800 families, each neighbourhood having its own public school and with groups of neighbourhoods making up a "community". A regional town centre and shopping centre serves four communities. Erin Mills is still being developed on 8,000 acres northwest of Metropolitan Toronto and is estimated to house 25,000 people currently with about one-third of its 8,000 acres developed. The Erin Mills plan has less clarity of organization than Don Mills, but its principles are similar. A hierarchical street system, separation of vehicles from pedestrians, loop roads and cul-de-sacs, and an extensive walkway system are important elements of Erin Mills planning. However, the housing being built currently is on narrower lots, 50 foot for the larger houses, 40 and 30 foot lots for smaller, less expensive units. Moreover, the housing itself is reverting to a form similar to that of inner city housing - narrower houses of two and three storeys with less ground relationship. The most striking difference is the garage, which is still in front of the house and now occupies a large percentage of the house frontage. Lots are relatively shallow with a small rear garden; and the internal organization of the house typically has a central entrance and stair, rather than the side entrance and stair which are more prevalent in older central city housing. The materials and detailing of the new Erin Mills housing are very different from the "modern" style of the Don Mills examples. Traditional elements - fan lights, bay windows, gables, dormers, mullioned windows and shutter details are reminiscent of Victorian housing, while brick is used extensively as a facing material. Architectural control is exercised by the development company throughout Erin Mills over both exterior elevations and colours.

Figure 7 shows a small area of Erin Mills which is located just east of the Erin Mills Parkway and south of a parkway belt and a major highway. The houses in the cul-de-sac illustrated were built in 1980 and 1981, with some just occupied in the past months. Figure 7 shows the housing as it is presently. Street trees, required by the developer, are planted at regular intervals between the sidewalk and the road and are presently very small. Residents have as yet had little opportunity to plant their own shrubs and trees, build fences or otherwise begin to place their individual imprint on the regularity of the street.

Figures 8 and 8a are an example of the division of typical house in such a way that the owner could subdivide and sell the second unit with its accompanying lot as freehold or condominium. The existing house is a four bedroom, two storey unit, approximate 2,015 square feet with a full basement (unfinished) and double garage. In Figure 8a the house is divided vertically along an interior bearing wall. In Unit A the ground floor is extended slightly at the rear and the front, and an exterior side stair to the basement is added. Unit A is a long, narrow unit, 900 square feet plus basement, which is shown with two bedrooms on the second floor. It can also retain the existing large bedroom and bathroom on the second floor to create a more generous one bedroom unit. Its twelve foot* width is tight, but acceptable for a couple or single person.

Unit B is a three bedroom unit of 1350 square feet, which requires very little change from the original floor plan.

Figures 9 and 9a illustrate the conversion of a two storey, three bedroom house, 1787 square feet with unfinished basement, to two units, a two bedroom and a three bedroom. Unit A, the two bedroom unit, has a small foyer (shared with Unit B), kitchen, two piece bathroom and dining room on the ground floor. The previously unfinished basement is finished to provide a living room with walkout to a newly excavated terrace which is half a level down from grade. A small study, furnace and laundry room, two bedrooms and a second three piece bathroom are at the basement level. This unit has a total of 1200 square feet.

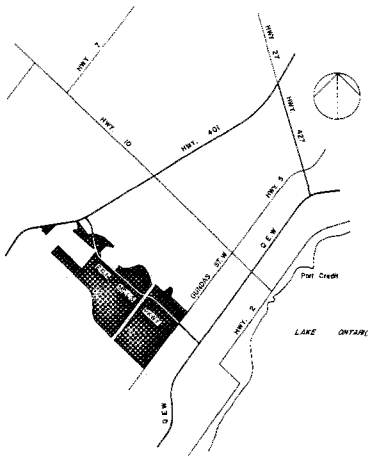
Unit B, the three bedroom unit, has a living, dining room and large kitchen on the ground floor. On the second floor the room layout remains untouched with a master bedroom with ensuite three piece bath and two smaller bedrooms sharing a second bathroom. This unit has a total of 1225 square feet.

Figure 10 shows the Erin Mills street as it could be in ten or fifteen years. The street trees have matured and individual residents have added fences, planting and swimming pools. Houses have been adapted in a variety of ways,

* It is interesting to note that the new suburban houses of this type are all based on a twelve foot modular width or less to allow for standard twelve foot widths of carpeting.

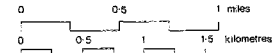
based on the two basic types illustrated in preceding figures. However the configuration of lots, their narrow frontage and particularly their shallow depth, has lead to a rejection of the opportunity for demolition and infill which can be more readily accommodated in the Don Mills example. It is interesting to compare the form of the Erin Mills street in Figure 10 with the form and streetscape of a downtown core neighbourhood. Figure 11 shows an area of single family housing in downtown Toronto, built around the turn of the century. While the two street patterns are dramatically different, the housing form is quite similar and both differ greatly from the 1950's example.

The street as shown in its current condition contains about 25 houses and would house approximately 85 people. Assuming again that every second house might be subdivided into two units, the number of units increases from 25 to 37, a 50% increase. The number of people housed rises from 85 to 105, a 23% increase.



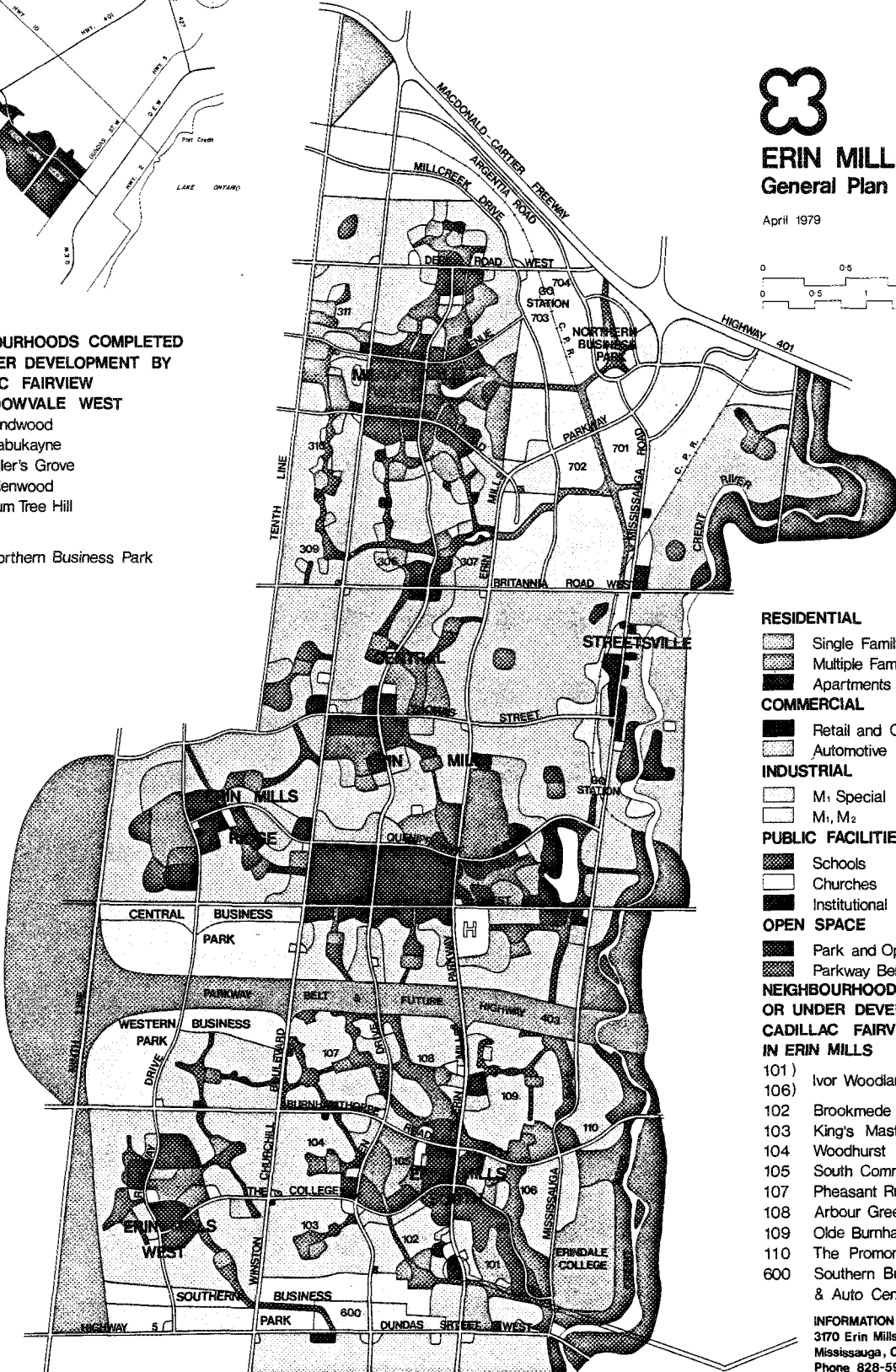
ERIN MILLS General Plan

April 1979



NEIGHBOURHOODS COMPLETED OR UNDER DEVELOPMENT BY CADILLAC FAIRVIEW IN MEADOWVALE WEST

- 306 Windwood
- 307 Wabukayne
- 309 Miller's Grove
- 310 Edenwood
- 311 Plum Tree Hill
- 701)
- 702) Northern Business Park
- 703
- 704



RESIDENTIAL

- Single Family
- Multiple Family
- Apartments

COMMERCIAL

- Retail and Office
- Automotive

INDUSTRIAL

- M₁ Special
- M₁, M₂

PUBLIC FACILITIES

- Schools
- Churches
- Institutional

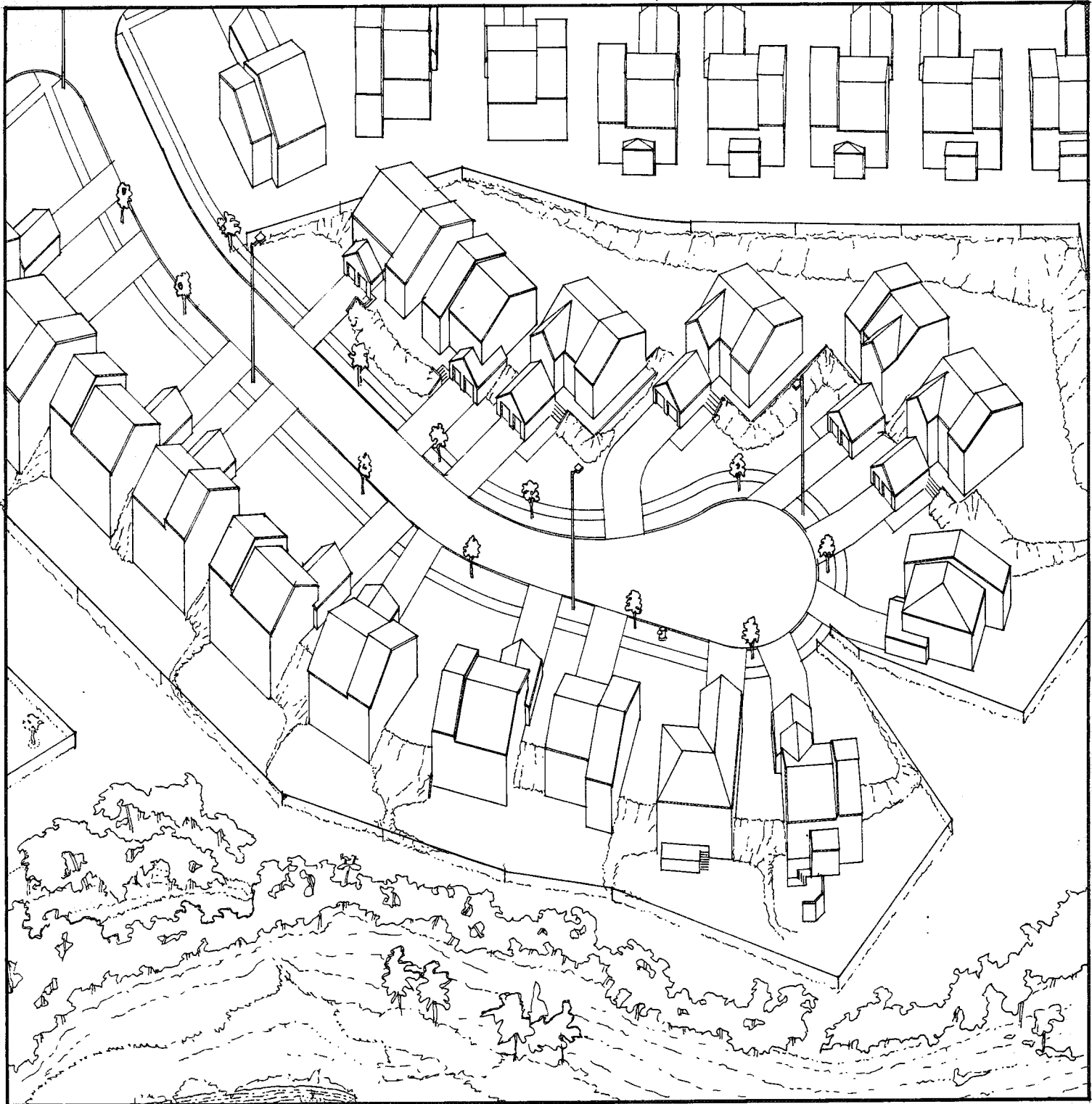
OPEN SPACE

- Park and Open Space
- Parkway Belt and Services

NEIGHBOURHOODS COMPLETED OR UNDER DEVELOPMENT BY CADILLAC FAIRVIEW IN ERIN MILLS

- 101)
- 106) Ivor Woodlands
- 102 Brookmede
- 103 King's Masting
- 104 Woodhurst
- 105 South Common
- 107 Pheasant Run
- 108 Arbour Green
- 109 Olde Burnhamthorpe
- 110 The Promontory
- 600 Southern Business Park & Auto Centre

INFORMATION CENTRE
3170 Erin Mills Parkway
Mississauga, Ontario
Phone 828-5920



0 50 100 ft.



ERIN MILLS *existing (1981)*

FIGURE 7

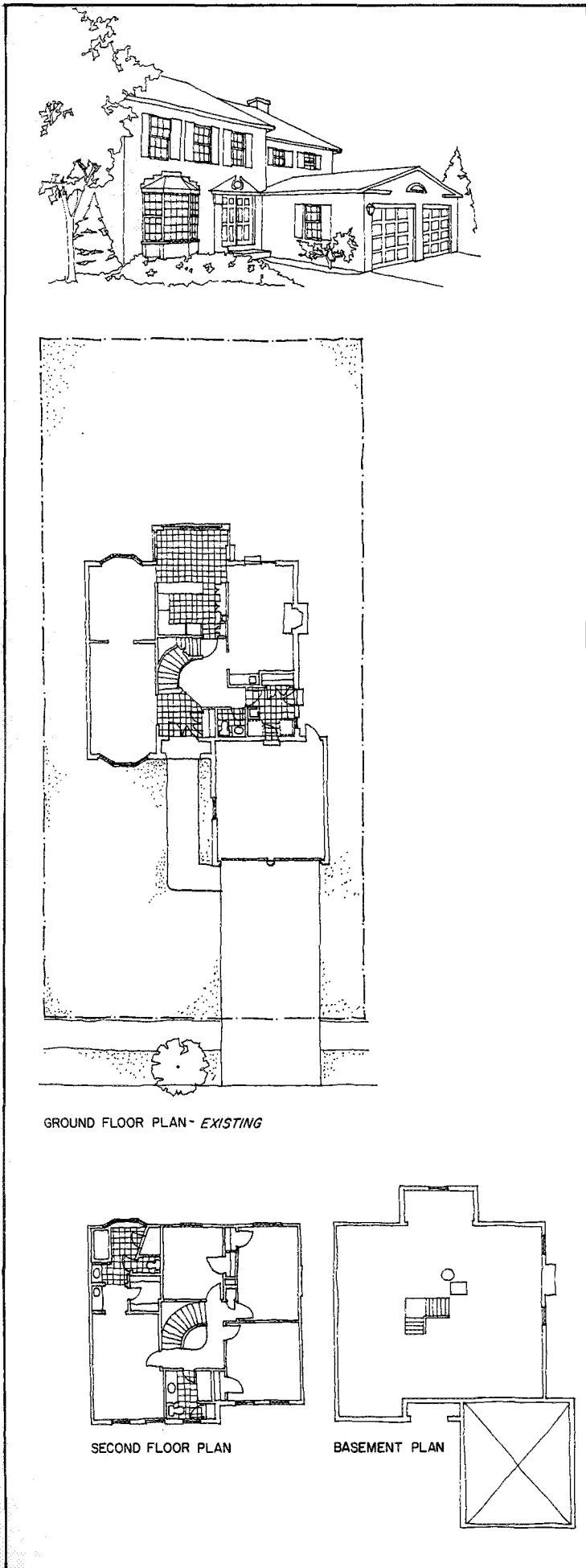


FIGURE 8

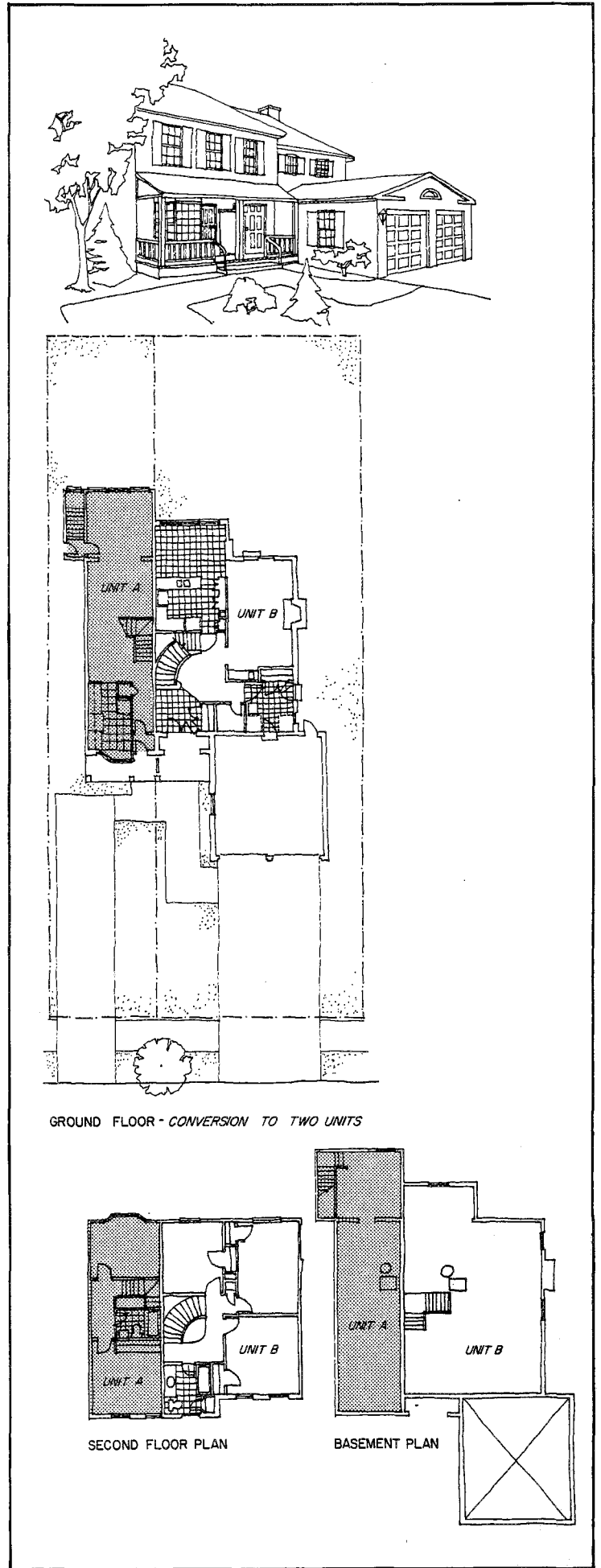
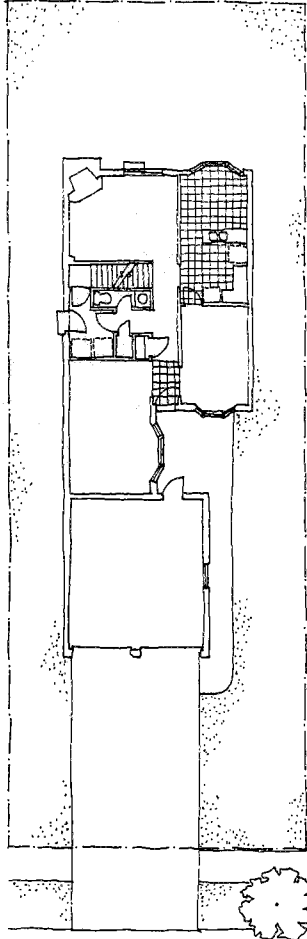
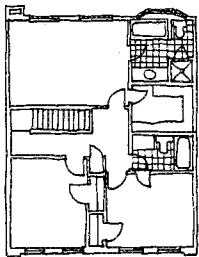


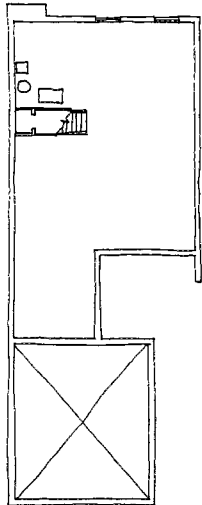
FIGURE 8a



GROUND FLOOR PLAN-
EXISTING

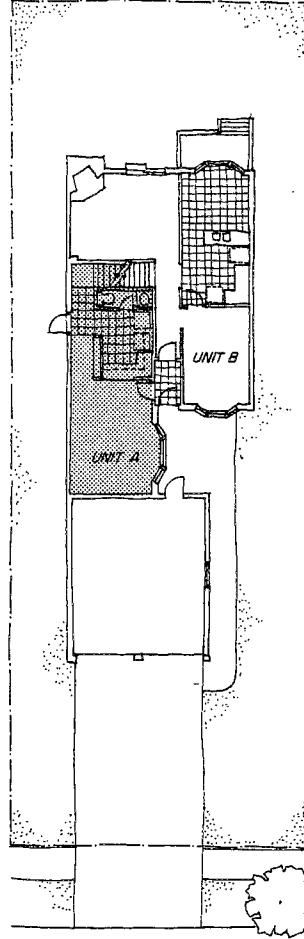


SECOND FLOOR PLAN

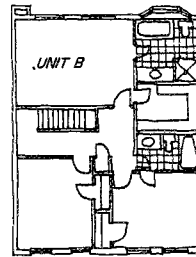


BASEMENT PLAN

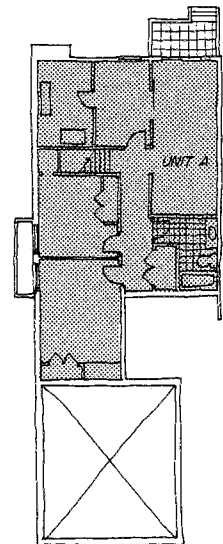
FIGURE 9



GROUND FLOOR PLAN-
CONVERSION TO TWO UNITS

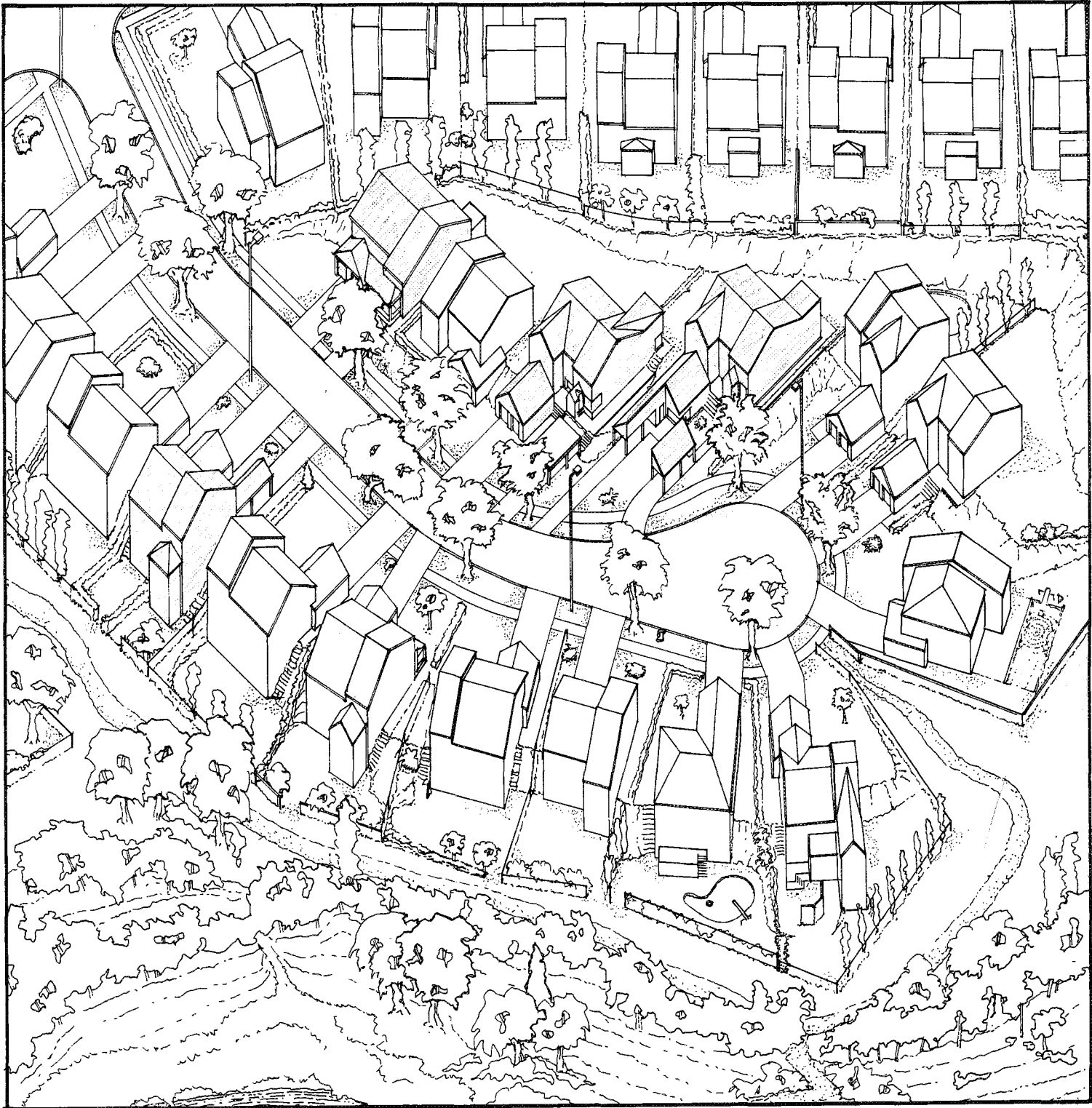


SECOND FLOOR PLAN



BASEMENT PLAN

FIGURE 9a



0 50 100 ft.



ERIN MILLS *adaptation*

FIGURE 10

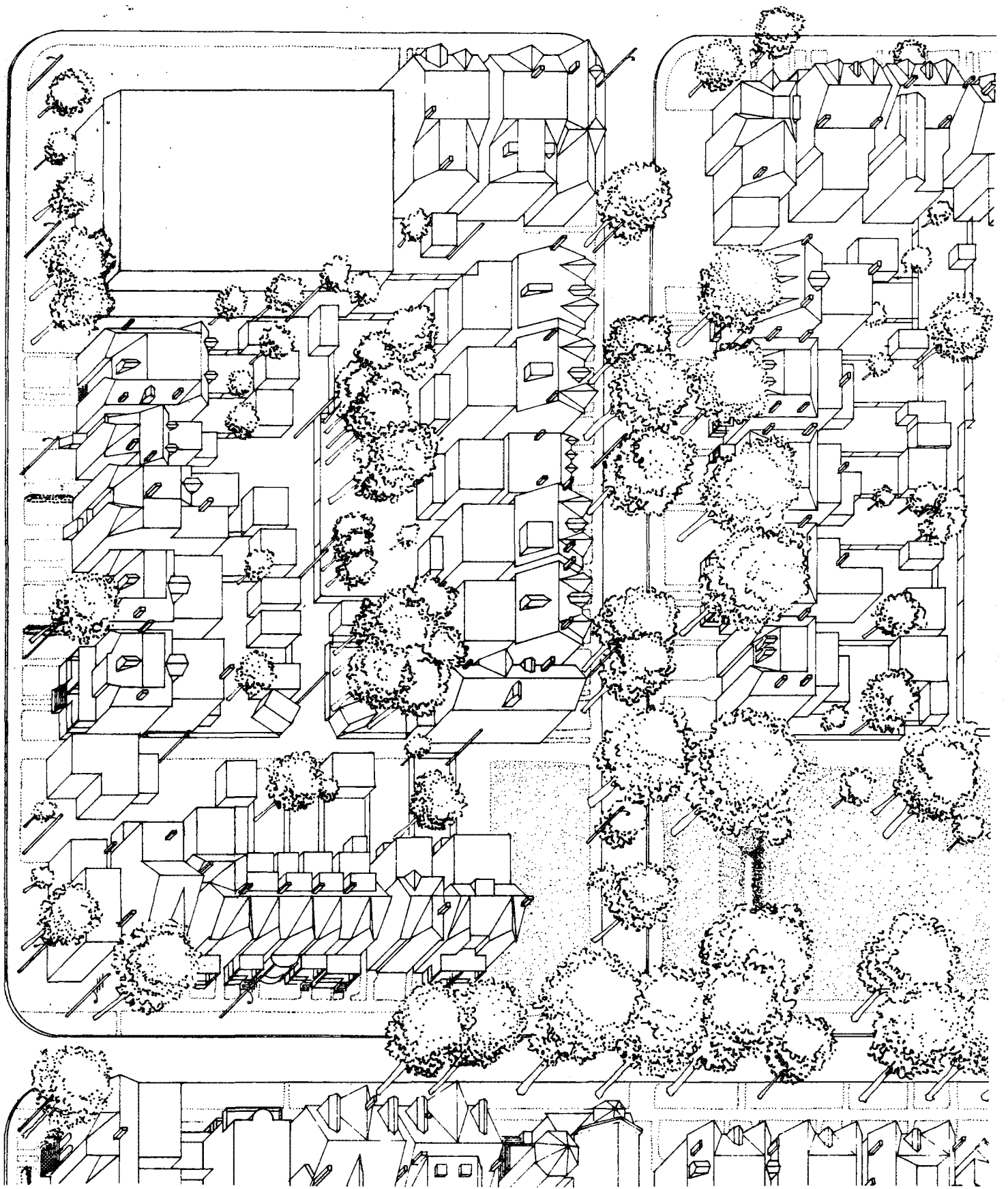


FIGURE 11

Economic Analysis

A cost analysis has been carried out for the renovations required for one of the Don Mills examples and one of the Erin Mills examples.

The Don Mills example illustrated in Figures 3 and 3a, which creates a second storey, requires almost a complete gutting of the existing house. New kitchens and bathrooms are built, a new electrical heating system is added to heat the new floor space, exterior walls are repainted and refinished to ensure that they match the new addition.

The construction costs of this renovation, if carried out by a contractor, are estimated at \$77,000. The resulting economic pro forma is as follows:

1. Assume the house is owned by an older couple who has no existing mortgage, but wish to remain in their own home and familiar neighbourhood while providing themselves with additional retirement income.

Construction Costs:

\$77,000 financed at 19%	=	\$14,630.00
Annual carrying cost	=	\$ 1,220 monthly

Potential monthly unit,		
Unit B	=	\$ 900

NET GAIN	=	(\$ 320 shortfall)
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Clearly at current interest rates, a renovation of this type could not be economically undertaken. At a 14% interest rate, the monthly carrying costs are equivalent to the rental which might be expected, \$900.00 monthly. At a 12% interest rate the monthly carrying costs are \$770.00, and the hypothetical Don Mills couple would add \$130.00 monthly or \$1,500.00 annually to their income.

Alternatively, if the Don Mills couple were skilled at some aspects of house renovation and were able to act as their own contractors and so some of the work themselves, the savings in construction costs could be 25% - 30%.

more back
1/2

While this alternative has significantly reduced renovation costs, the unit which is created is sufficiently smaller. Given its size and the greater distance between the Erin Mills area and central Toronto, the potential rental revenue is correspondingly less than in the Don Mills example. However, at reduced interest rates the owners of the house can increase their monthly income by \$80 - \$100 in the first year. If they were able to do some of the work themselves, the savings would be significantly greater.

The pro forma is now as follows:

Construction Costs:

\$57,750 financed at 19% = \$10,972
Annual carrying cost = \$ 915 monthly

Potential monthly rental
Unit B = \$ 900

\$57,750 financed at 17% = \$ 818 monthly
\$57,750 financed at 16% = \$ 770 monthly

If, as is possible, interests rates drop to 16% or 17%, the renovation of the house as shown is feasible. However, it is questionable whether there is sufficient financial incentive in this renovation scheme, given the small return and the amount of work required by the individual home owner. Present construction costs and high interest rates have not yet been matched by rents which justify the construction of rental housing in a way which requires as dramatic a structural change to the dwelling as is illustrated in this example.

2. The Erin Mills example, illustrated in Figures 8 and 8a requires much less structural and interior change to the existing house. A new kitchen is built in Unit A, but Unit B keeps its existing kitchen and its floor plan is close to that of the original house. The total construction cost of the renovation as shown under-taken entirely by a contractor, is estimated at \$38,700. The resulting pro forma analysis is as follows:

Construction Costs:

\$38,700 financed at 19% = \$ 7,353
Annual carrying cost = \$ 612 monthly

Potential monthly rental = \$ 600

Net Gain = NIL

\$38,700 financed @ 18% = \$ 580 monthly
\$38,700 financed @ 17% = \$ 550 monthly
\$38,700 financed @ 16% = \$ 516 monthly

Approvals

It is difficult to generalize about the feasibility of these options for suburban densification from the perspective of municipal approvals. The by-laws and zoning ordinances of every municipality differ widely. However, typically the proposals contained in this study are not permitted in areas of single family housing. Zoning by-laws permit only single family residences and require minimum lot widths less than those shown in the illustrated examples. Side yard and set back regulations may also be affected where small additions are made to the houses. In some cases the Official Plan has statements which permit only single family housing, necessitating both an Official Plan amendment and a rezoning in order to renovate a house to create two units.

While the suburbs are still for the most part exclusionary in their zoning for single family housing, it appears that pressure from individual home-owners is growing to allow the creation of apartments or duplex units within the single family house form. Several of the suburban Toronto municipalities are aware that such conversion are occurring illegally, as family household and economic needs change. Just as the "suburbs" of the 1900's and 1920's which are now central city neighbourhoods have adapted to accommodate duplexes, boarding houses and flats, it is expected that as the suburbs mature, similar pressures will provide a climate of political acceptability for such change.

Summary and Conclusions

Suburban development has taken a distinctly different physical pattern since the 1950's. It is a pattern and house type which has assumed that there is a single market for housing - the affluent young family, with small children, rising incomes and a mother who does not hold a job. This assumption about the housing market may have served a large percentage of the population in the 1950's and 1960's, but it does not hold today. The suburbs are now under pressure to adapt to changing life styles and a less buoyant economy. It is unlikely that these pressures will cease in the foreseeable future.

The object of this study has been to demonstrate that suburban housing can be adapted to allow a wider variety of household sizes and types, and to accept increased densities of from 25% to 50%. While this adaptation is not a panacea or cure-all for the problems of the suburban development pattern - it does not address the eccentric street pattern which creates severe difficulty for transit systems - it does provide a means for gradual incremental change, initiated by the individual home-owner. It is this kind of gradual, modest, individual change which has proven in the past to be the most effective and least damaging means of changing the structure of a city. It is recommended that public policy at the local Provincial and Federal levels recognize the value of such adaptation through relaxed zoning by-laws, and fiscal incentives to the individual homeowner to allow such adaptation to occur.