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INTRODUCTION

The objective of this treatise is to point out the basic design principles that ordinarily concern a planner when he deals with a residential development. The term residential development is defined as an architecturally integrated neighbourhood unit or an integral part of it.

The architectural integration is achieved by a design in which the elements involved, i.e., the building sites, (Fig. 1), the buildings themselves (Fig. 2), the circulation system (Fig. 3), and the open spaces (Fig. 4) are so arranged as to form a functional and aesthetically satisfactory composition. Such a composition is identifiable by a specific traffic arrangement whereby through and heavy traffic is channelled along the periphery of the neighbourhood rather than permitted to permeate it.

The neighbourhood is defined as a combination of physical and social features for the properly housed population of a school district. The physical features comprise mainly the street system, the built-up as well as the open spaces, and the location of stores and institutions. The social features include recreational, educational, and social welfare facilities. The last named are symbolized by the community centre located in the centre of gravity of the neighbourhood area.

The size of the neighbourhood may be said to elude definition. Although many authorities have recommended some particular size, usually between ten and twelve thousand people, one can name areas of two or three thousand persons which have been functioning satisfactorily as neighbourhoods. Three thousand people, however, is believed to be the smallest unit which can support the nucleus of a neighbourhood, i.e., an elementary school and a shopping centre. New developments much smaller than this minimum size are, of course, often built and these may be called housing units. Their size may vary from three hundred to one thousand people and a neighbourhood can be an integration of a series of such units.

One of the principal reasons for the neighbourhood as a concept in residential planning is the gratification of the drive of the individual for identification with the group. Such a drive, according to social psychologists, is strongly ingrained in human society. It manifests itself as a desire to conform to the street and to the neighbourhood.

Evidence points to the fact that the neighbourhood concept has been accepted as a desirable goal in the theory of residential planning. The acceptance, however, has not been unanimous because some flaws have been found in the concept. There has been criticism that the neighbourhood, as theoretically conceived, might favour the perpetuation of natural areas; and in the present state of building economics the aforementioned drive for group identification may be satisfied in other ways than by residential planning, for example, through social activities and group organization. Although not as a criticism of the neighbourhood, the words of Christopher Tunnard deserve a mention here:

"It goes without saying that environmental planning should be based on social needs although it is not a corollary that planning which ignores social needs must necessarily be bad. Many examples from the past can find justification for modern use although their origin was based on an entirely different set of values, from those now obtaining."

In spite of the popularity of the neighbourhood idea in the community of planners, neighbourhood planning is rarely carried out in practice, largely because of the attitude of pressure groups. The upper classes demand the most rigid protection, sometimes to the general disadvantage of the city. They oppose new residential developments if they seem too close to their "reservations." They dislike to break up segregated areas because they are afraid of neighbours who "do not fit." Speculators who have bought cheap land press for costly improvements so that land values may rise. Such improvements, however, rarely conform to the requirements of sound neighbourhood planning.

In order to satisfy the housing needs of various family groups, the neighbourhood plan includes a variety of dwelling types. The resulting building forms are used in the planning of variegated compositions or, as they are sometimes called, mixed developments. This is not merely a matter of stopping one kind of building form and starting another, but of mixing the forms together in such a way that each is related to its neighbour and to the neighbourhood as a whole. When the building forms are treated in this manner, it is possible to obtain great interest in the contrasts between the spaces, the masses and the silhouettes. This kind of neighbourhood plan has been successfully practiced in Britain.

In the U.S. and Canada, however, such a plan would conflict with the established zoning policy which confines the use of certain dwelling types to certain parts of the city only. The city is divided into sections which mainly follow a combination of the BURGESS and HOYT pattern. For each section the permissible dwelling types are specified by the zoning by-law. Existing polynucleation and partial decentralization is maintained by designating certain streets in every section for business and mixed use. These streets are ordinarily the main thoroughfares.

It should be emphasized that one of the purposes of zoning is the protection of the privileged position of the residents in "desirable" residential sections and the preservation of land values is the main reason for the protection. Whether these sections are existing or proposed, the only dwelling type permitted in them is a single-family house, the protection of which may be further strengthened by covenants. In these sections the neighbourhood plan of the above description would naturally meet the strongest opposition. In spite of these difficulties, some commendable neighbourhoods have been planned and realized in the U.S. and Canada.

The above remarks imply the dilemma in which the author found himself during his work. He subscribed to the neighbourhood concept but he discovered the obstacles with respect to its practical application. Since the objective has been the preparation of a planner's guide rather than a theoretical dissertation, the aim sought has been to achieve a compromise between the attainable and the ideal. It should be realized that a good many of the design considerations which have been dealt with in this work are not affected either by the acceptance or by the rejection of the neighbourhood concepts.

The material has been presented as a series of appraisals of selected design situations under two chapter headings:

- I Single-Family Developments
- II Mixed Developments

In the Appendix, four housing developments were appraised and a presentation in the question-answer form was ventured.

CHAPTER ONE

SINGLE FAMILY DEVELOPMENTS

LAYOUT SYSTEMS IN SUBDIVISION PLANNING

Introduction

When subdivisions have been planned certain layout systems have been advocated because they would utilize the sites of the lots to a high degree, would economically distribute the utility lines, or would present savings in the construction of roadways. The systems which have been devised and practised have been based on the use of one of the following layout devices: a particular type of block, a specific type of street, or street arrangement. Any plan in which one of these devices repeats itself may be recognizable by its definite layout pattern. A plan which possesses a recognizable layout pattern will for the purpose of this discussion be henceforth called a layout system.

In this chapter, the following layout systems will be presented for analysis:

1. Long blocks
2. Internally developed blocks
3. Culs-de-sac
4. Loops with ends on open spaces
5. Loops with ends closed by lots
6. Gridiron

Of the above, the gridiron represents the most conservative, and the loops and culs-de-sac the most progressive form of present day subdivision planning. However, layout systems must be recognized as merely planning formulae and should not be imposed upon a site as a preconceived arrangement with little or no regard to the site's uniqueness.

One must admit that the shape and size of the site, its traffic accessibility, its integration with the neighborhood, the lay-of-the-land, and natural amenities are factors which hardly ever make two residential sites alike. These factors

are valid justification for the conviction that a subdivision ought to be designed rather than be subjected to a layout system. Creative design based upon the "personality" of the site and deriving its inspiration from the site is the only logical planning method.

Supporters of layout systems, however, assert that creative design is visionary, impractical and costly, whereas a layout system is a practical, time-tested and economical form of planning. As far as the characteristics of the site are concerned, they believe that a system can, if necessary, be adjusted to meet the specific physical conditions. There are many who believe that the layout system corresponds better than does the creative design to established engineering practices in the planning of streets and public utilities. These arguments cannot be dismissed lightly. One cannot, in fact, deny that a skilful application of a layout system may prove to be a better subdivision plan than an ill-conceived creative design.

In order to throw some light on this controversial matter, a critical appraisal of basic layout systems will now be presented. In the series of plans that follow, each of the six previously mentioned systems has been applied to the same residential site. The area of the site is 184.7 acres. It may here be mentioned that plans 1 - 6 are taken from the publication entitled "TOWNSHIP LAYOUT" by T.B. Floyd (1.). Their appraisal, however, is the work of the author.

As will be noted, each of the systems selected has been applied to the given site with a commendable degree of planning skill. The critical comments accompanying each plan should, therefore, be attributed to the system as such and to its inherent limitations. Every plan has been appraised from the point of view of those amenities of living which are expected from a well-designed neighborhood. After all, a subdivision plan should accomplish more than an economical accommodation of houses on lots - it should provide for a pleasant community of homes.

In order to furnish a comparison between the layout systems and the opposite form of subdivision planning, namely, creative design, plan No. 7 has been worked out and included. Conclusions which may be drawn from this comparison are presented on p.21 They are accompanied by a table in which the pertinent technical data relating to all schemes (1 - 7) is evident.

2

1. LONG BLOCKS

Figure 5.

SCH School
SH Shopping Centre

PO Post Office
T Theatre

Opinions vary as to what should be the maximum length of blocks. Whilst some authorities put the limit as high as 2,000 feet or more, the American Society of Civil Engineers recommends 1,300 feet, provided that blocks of such length are equipped with pedestrian crossings. The same authority considers blocks less than 600 feet long uneconomical with respect to utilization of the surrounding streets.

While the longest blocks in this scheme are approximately 1,300 feet long, no crosswalks are provided for pedestrians. Block lengths which, according to the previous paragraph are considered uneconomical, have been used. The grouping of blocks renders the achievement of the desirable traffic distinction between major and minor residential streets difficult.

The table on p. shows that the use of long blocks resulted in an excessive amount of roadway, the figure being the second highest of all layout systems. For this serious disadvantage there is, nevertheless, some compensation in a fairly low cost index figure for the construction of sewers; the maintenance and the planning of domestic and storm sewers would be fairly economical. A certain compensation for the extravagance in roadways also accrues from the high rate of land utilization for lots, the net residential density being the second highest of the systems under review.

The marked monotony of the building line can easily be imagined from the plan. This, however, is the inherent disadvantage of long blocks and could only partially be remedied by using variations in setbacks.

Public buildings are located too close to residences, such arrangement being objectionable from the point of view of sound principles of zoning. These buildings would require considerably more parking space than was provided. To remedy this situation would be difficult in view of the restricted space devoted to the buildings as a civic group.

2. INTERNALLY DEVELOPED BLOCKS

Figure 6.

SCH School
SH Shopping Centre
CH Church

PO Post Office
T Theatre

In this layout, although there are fewer and less objectionable traffic junctions than in the preceding one, the general accessibility, particularly of the internal blocks, is less favourable. It may, however, be gathered from the plan that the inadequate accessibility could be improved by providing at least two entrances for the internal blocks.

Internally developed blocks might be considered either as having an undesirable shut-in effect or a desirable atmosphere of seclusion. Although internal blocks are controversial in this respect, it should be remembered that if they are employed they do not constitute the major part of the development.

In the plan, a certain amount of open space has been devoted to triangular green areas located in conjunction with the internal blocks. Designated as public spaces, these green triangles are supposed to alleviate the dense effect in and around the internal blocks. The small size of these spaces would hardly render them suitable as public parks. Their maintenance would be costly on account of the number of isolated locations. The amount of open space in this and in the preceding scheme is about equal (approximately 10 percent of the total area). In this scheme, however, there is definitely less park space than in the preceding scheme since the green triangles cannot be expected to fulfill the function of a park which serves the needs of the entire neighborhood. One can only defend the existence of these green areas as points of interest around which houses are grouped for the purpose of an extension of outlook.

As far as community buildings are concerned, the remarks made about scheme No. 1 also apply here.

3. CULS-DE-SAC

Figure 7.

SCH School
SH Shopping Centre
CH Church

PO Post Office
T Theatre

The use of culs-de-sac in this scheme has resulted in the over-all amount of road paving being slightly less than in the majority of the other schemes. Moreover, if the lots in this layout were circled around all turn-arounds of the culs-de-sac, the comparison would have been even more favourable, since the length of some of the culs-de-sac could have been shortened. As could be expected, the culs-de-sac have permitted a majority of lots to be withdrawn from the disturbing influence of major streets. It is axiomatic that culs-de-sac must branch off from major residential streets; otherwise, traffic inconveniences result. This layout complies with the axiom. The turn-arounds of some culs-de-sac are located in such a manner that the depth of one of the two adjoining lots is decreased to an undesirable minimum.

In the design of culs-de-sac, the length and the width of the leg, and the dimensioning of the turning space are important. The recommended length for a cul-de-sac with circular turn-around is 400-500 feet, whereas back-arounds should only be 300-350 feet. The position of the turning space of culs-de-sac can be either symmetrical or asymmetrical with respect to the leg. The former position is considered better for lot utilization under normal conditions, and possibly for the movement of traffic, than the latter.

In the plan the property lines have been used for the outline of culs-de-sac streets. Therefore, it can be assumed that the turning spaces of culs-de-sac are circular and adequately dimensioned for the flow of traffic along a residential street. One block in the south-east

corner of the neighbourhood attracts attention for its complicated lot layout, which would necessitate the utility lines cutting across lots in most undesirable locations. A few isolated examples of undesirably shaped lots with respect to accessibility and utilization for building can be detected in the plan.

Approximately 10 percent of the total area has been devoted to open spaces which take the form of adequately dimensioned public parks.

4. LOOPS WITH ENDS ON OPEN SPACES

Figure 8.

SCH School
SH Shopping Centre
CH Church

PO Post Office
T Theatre
MH Municipal Hall

In principle the loop can be very helpful in subdivision planning, its main purpose being to discourage through traffic from using the residential street as a short cut. The loop in this system differs from the standard arrangement in that no lots are placed around its end. This modification has been made in order to achieve an unobstructed contact with the park around which a number of loops are grouped. As a result, some lots benefit by a pleasant exposure to open spaces. Their number amounts to 4 lots per loop which, on average, only means 10 percent of the lots within a loop.

Improvement gained for such a small proportion can hardly justify the increased costs of this system as compared to loops with ends used for lots (scheme 5). The 639 lots achieved in this scheme require 31,995 feet of roadways as against 650 lots and 30,175 feet in scheme 5; therefore, each lot in this subdivision needs four more feet of roadways.

From the design point of view, the application of the system of loops with open ends has resulted in a marked inconsistency between the southern and northern parts of the plan. One might easily draw up a line dividing the two sections. In the southern part the loops are not substantially different from the usual monotonous rectangular blocks, the tedium being repeated along the two major streets from which the loops branch off. In the northern part the design forms a variegated pattern of considerable quality as a result of the employment of interesting and imaginative loop formations. In this part, however, little has been achieved by keeping the

loop ends open. In between the looping streets the open spaces take the form of small and narrow strips that are hardly any wider than two road allowances. Spaces of such shape and size do not justify the extravagance of unused loop ends.

The low rate of utilization of looping streets in this system could be offset only by the increased market price charged for choice lots. The number of these, however, is small, particularly in the southern part. Here only 46 out of the available 356 lots might belong in this category.

5. LOOPS WITH ENDS CLOSED BY LOTS

Figure 9.

SCH School
SH Shopping Centre
CH Church

PO Post Office
T Theatre
MH Municipal Hall

The kind of loop employed in this scheme is economical in that the entire course of the looping street is utilized. There is a good integration of the loops with the major residential streets. As has been stated before, the loops should feed directly onto major residential streets. Cross junctions, however, should be avoided whenever possible, particularly when two streets of equal traffic importance cross. This applies to both major and minor residential streets, the former situation being more hazardous than the latter. In any event, effort should be made to reduce the number of cross junctions.

It will be noted in the plan that the community buildings have been centred around two T-junctions which are too close to each other to provide a satisfactory arrangement with respect to the control of traffic. If parking areas were provided and were adequate in size, it would further aggravate the situation. It may be gathered from the plan that better locations for the public buildings, as a group, were available.

One of the major residential streets cuts through the public open space, thus creating an undesirable division. As a result, the park is engulfed by major traffic streets. If the intervening street had been eliminated, a desirable continuity of open space would have been achieved. In order to consolidate the park space, a different location for the school would have to be contemplated within the public open space area.

In the plan a certain number of small open spaces of varying size have been employed. These were meant, presumably, to serve as green links for pedestrian access to public open spaces, as well as easements for sewerage and storm water drainage. The amount of land devoted for either purpose mentioned is excessive. Strips or channels, approximately 15 feet wide, would have been ample.

These green wedges, as proposed, imply excessive maintenance costs. Their value to the lots abutting on them, as well as to the neighbourhood as a whole, can be questioned from the economic and functional point of view. These spaces are not suitably located for the purpose of using them as greens on which to front certain groups of houses. Some of them, however, might prove useful as tot lots.

6. GRIDIRON

Figure 10.

SCH School
SH Shopping Centre

PO Post Office
CH Church

This scheme, though labelled Gridiron, is not a true representative of grid planning. As compared to a typical grid plan, certain improvements have been achieved and these can be summarized as follows:

Heavy traffic is channelled along peripheral highways rather than allowed to flow through the planned areas. These highways define the limits of the area which is thus differentiated as a planning unit from the surrounding residential developments. The designer realized that the repetition of the East-West alignment of blocks throughout the entire area would have resulted in an undesirably high frequency of traffic junctions along the highways. Therefore, he altered the alignment of blocks along the major part of the periphery.

Unlike in the customary grid, the width of residential streets is not uniform. The designer differentiated between major and minor streets as far as the width of road allowances is concerned. The distinction, however, was not expressed clearly enough in the plan. Views along most streets have been arrested as a result of the position of blocks located along the peripheral highways. This arrangement is a considerable improvement over the monotony of the infinite, unarrested views along the standard grid streets.

Notwithstanding the foregoing remarks, the scheme invites the following criticism:

As far as traffic is concerned, the sameness of the street pattern would preclude an efficient differentiation between major and minor residential streets. Also, there are too many undesirable cross junctions. The street layout lacks architectural quality; it achieves little more than the mechanical carving of the area into blocks of almost uniform size and shape. Public open spaces are badly broken up. They are not only isolated by streets but also engulfed by them. One of the parks is considerably off the centre of population gravity. Neighbourhood public buildings are merely accommodated. As a group, they do not present themselves as a pleasing and distinct architectural composition. Churches have been located as focal points for certain vistas. Unfortunately, they are in proximity to the adjacent residences.

The grid, no matter whether in typical form or in modification such as this, is an objectionable layout device to use in neighbourhood planning. It can hardly achieve the kind of physical environment which has been recommended for neighbourhoods earlier in this treatise.

SCHEME 7

Figure 11.

SCH School
SH Shopping Centre

CH Church
T Theatre

This plan, as distinguished from the previous six, represents a different planning approach in that it is inspired rather than based on any preconceived layout device. As a creative design, it strives for the achievement of a desirable neighborhood environment.

Having taken the topography of the site into consideration the designer set himself the following objectives when preparing this design: to connect judiciously the site with the peripheral highways by means of traffic junctions of the appropriate type, number and spacing; to provide for the functional distribution of residential traffic within the site by means of a properly conceived network of major and minor streets; to achieve the desired privacy for the residences as well as their pleasant architectural arrangement by way of a well-devised lot layout; to plan the public open space as a continuous recreational area suitably located with respect to the needs of the whole neighborhood; finally, to locate the public buildings as a group close to the centre of neighborhood gravity, bearing in mind the need for an architectural treatment of the group as a satisfactory composition, well integrated with the public open space.

The manner in which these objectives were translated into the plan form should be apparent from the design. It should be realized that this design is not the only answer to the objectives stated above, rather, it should be taken as an illustration of the planning technique which it represents.

TABLE: LAYOUT SYSTEMS IN SUBDIVISION PLANNING

	1	2	3	4	5	6	7
TOTAL AREA	184.7	184.7	184.7	184.7	184.7	184.7	184.7
SCHOOL (ACRES)	7.0	7.0	7.0	7.0	7.0	7.0	-
SCHOOLS AND PARKS (ACRES)	18.1	18.5	18.0	23.0	21.8	18.0	23.5
(% TOTAL AREA)	9.8	10.0	9.8	12.5	11.8	9.8	12.7
INTERNAL ROADS (FT.)	34,215	33,515	30,255	31,995	30,175	34,765	26,400
(ACRES)	51.9	51.6	49.3	50.3	49.3	53.7	40.7
INDEX FOR COST COMP.	1.30	1.27	1.15	1.21	1.14	1.31	1.00
SEWERS - DOMESTIC	28,600	27,500	31,900	27,750	32,700	25,600	27,500
- STORM	14,700	14,000	12,300	12,900	10,500	14,500	13,200
NO. OF MAN HOLES	154	134	158	151	109	142	106
INDEX OF COMP.	1.07	1.14	1.14	1.01	1.00	1.03	*
DENSITY - GROSS (DWEL/AC)	3.67	3.66	3.45	3.46	3.52	3.64	3.55
- NET (DWEL/AC)	5.90	5.89	5.42	5.72	5.72	5.95	5.45
No. of Lots	677	675	637	639	650	673	660#

- IN THIS CASE THE SCHOOL BUILDING AND ITS PLAYGROUND AREA FORM AN INTEGRAL PART OF THE NEIGHBOURHOOD CENTER AND THE PUBLIC OPEN SPACE ; NO FIGURE IS THEREFORE GIVEN.

* LACK OF INFORMATION WITH REGARD TO LOCAL CONDITIONS (DEPTH OF SEWERS FOR INSTANCE) PREVENTED AN EVALUATION ON THE SAME BASIS AS IN CASES 4-6.

IN THIS DESIGN, THE LOT LAYOUT DOES NOT INCLUDE ANY NON-RESIDENTIAL LOTS. IN CASES 1-6, HOWEVER SUCH LOTS EXIST AND A VARYING NUMBER OF THEM HAVE BEEN INCLUDED IN THE TOTAL NUMBER OF LOTS IN EACH CASE. IN ORDER TO MAKE THE NECESSARY ADJUSTMENTS, 10 LOTS WERE ADDED IN CASE 7, BRINGING ITS TOTAL TO 660 LOTS.

CONCLUSIONS

A study of the figures presented in the table should reveal that none of the systems (schemes 1 - 6) is more economical than the creative design (scheme 7). In fact, the overall length of roadways which is often the most expensive item in a subdivision is higher in each of the systems than in scheme 7. In this scheme, the overall length of roadways is 12 percent lower than in scheme 5 (the lowest amount of roadways of the systems) and 27 percent lower than in scheme 6 (the highest amount of roadways of all systems).

Moreover, scheme 7 is the second lowest of all schemes with respect to the required length of domestic and storm sewers; also, it needs the lowest number of manholes.

The average number of lots achieved in the six systems is 658, which compares with 660 in scheme 7, in spite of the fact that the latter devoted the largest acreage to public open space.

As designs of suitable neighborhoods, the systems deserved criticisms, therefore, the remarks made elsewhere should now be recalled. Observations made in this study prompt a conclusion that layout systems do not provide the advantages in subdivision planning which are claimed by their advocates.

Note: It will be noticed that domestic sewers in schemes 1 - 6 are located at rear of lots, this being the practice in South Africa where these plans were originally drawn. Consequently, the same sewer arrangement had to be made in scheme 7 in order to provide the same basis for comparison. For the same reason, catch basins in scheme 7 were arranged in the same manner as in schemes 1 - 6. Easements, though required, are not shown on the plans. In all schemes, the size of lots is 70 feet by 100 feet.

This scheme demonstrates a sound planning approach under unusually difficult terrain conditions. The example is from Atikokan, the home of Steep Rock Mines, in rugged Northern Ontario. The contour map (Fig. 12) of the site records the presence of sharply rising rock outcrops 60 to 150 feet high as well as considerably large pockets of swamps 5 to 6 feet deep.

The designer's strategy was to avoid rock cuts, to utilize the swamps as much as possible, and to relate the street system to the terrain. Poplar Avenue, for instance, was terminated with a round-about in order to avoid a cut through rock outcrop. Swamp areas have been suitably landscaped and drained and within them certain locations provided acceptable foundation conditions for the location of public buildings.

The achievement of proper relationship of a street to contours may be demonstrated on Maple Crescent. On entering the site from O'Brien Street, Maple Crescent runs almost parallel to contours so as to facilitate proper drainage for water runoff and sewage disposal. At the junction of Birch Road, the street turns and cuts at right angle to contours, thus reducing expensive cuts and fills and again enabling proper drainage.

The survey work for this type of layout is more difficult and more expensive than for the usual grid street system but the additional expense is more than compensated for by the achievement of the minimum and the uniform depth of sewer trenching.

The street curvature employed in the scheme is gentle enough to make the building line interesting and the grouping of buildings architecturally desirable.

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In 1929, C.S. Stein and Henry Wright introduced a new approach to residential planning in their design of the suburb of Radburn in New Jersey. They originated the modern neighbourhood idea in the form that has since become generally accepted (see F.14). The illustration shows the basic element of the plan, a cul-de-sac street, the merits of which may be summarized as follows:

Vehicular access to houses and garages, delivery and other services are from short dead-end streets, called service lanes, which also serve for most of the parking. On these streets there are no sidewalks, these being located as footways on the perimeter of each house group. As opposed to established planning practices, houses have been "turned around," the living rooms, porches, and as many bedrooms as possible facing the garden; kitchens, garages and cellar storage being accessible from service lanes. The architectural discipline of the house group as a unit was achieved by the employment of a judicious building line, continuity in roof lines, consistency in the use of building materials, and by proper planning of landscape elements. With respect to the location of garages, "the disorderly loose appearance of the free standing houses in relation to each other, and the insufficient space left on either side of the small buildings lead us to join houses by coupling garages -- the most interesting grouping of two houses was that in which garages and houses were joined by porches, through which summer breezes could play" (2, p.54).

This subdivision from Winnipeg merits attention as one of the few examples of superbblock planning in Canada. Like Radburn, the centre of the superbblock is devoted to a communal park, but loops instead of culs-de-sac were used in the Wildwood project as the basic design element. The illustration shows the design of a house group around a typical looping street. Although the Wildwood plan appears more "crowded" than Radburn, it must be remembered that the former employed single-family houses whereas duplexes were used in the latter.

In Wildwood, the looping streets were originally designed for service only, the main approach to the houses was visualized to be from the walks through the central park. These walks, however, are never used during the six months of winter in Winnipeg. Consequently, they are not maintained in that period. Even during the summer the street is more frequently used since driving is preferred to walking. Therefore, in spite of the unorthodox nature of the subdivision, the street retains its orthodox position as the main approach to the houses. This position, however, is not affirmed architecturally, largely on account of the detached garages which present themselves as an unsightly element in the street facade. Moreover, in spite of the variety of house types used, the street has a stereotype, back-lane character. The Radburn cul-de-sac streets were also designed as service lanes only, yet architecturally they make pleasing compositions. In Wildwood, 37 percent of houses are inside the loop where some of them overlook the garages or the bend of the street where the crowding of houses and garages is most pronounced.

This plan illustrates the now prevalent arrangement of the building line. The distances at which the houses are set back from the street, or setbacks, vary irregularly from house to house along the street. As a result, the building line is broken up and the locations of houses on lots appear to be random. For this reason, the arrangement has been termed "randomization" of setbacks.

Randomization, obviously, is a distortion. Like other forms of irregularity in the realm of aesthetics, it can be quite pleasing. To achieve such distortion in subdivision design, however, skill and vision of an experienced architect is required. Subdivisions, unfortunately, receive architectural attention only sporadically. When speculative builders use this kind of setback arrangement as one of the "modern" devices, the results seldom amount to more than a senseless disorder.

The purpose of using this pattern of setbacks is, no doubt, an effort to counteract the usual monotony of the street alignment. It is safe to say that the pleasing informality of a skilful randomization should be able to achieve this purpose. The greater the monotony of the street layout, the greater the need for some counterbalancing effect, and vice versa.

In this plan, the street system is not in the least monotonous. In fact, it has a considerable architectural quality for the culs-de-sac and curved streets provide sufficient interest; there was, as a consequence, no apparent need for drastic variations in the arrangement of setbacks. The two curved streets around the club might serve as a good illustration. They are of such a curvature as to assure architectural interest even if no variation in setbacks were employed. In fact, one wonders if the proposed setbacks would not overdramatize the total aesthetic effect to the point of detracting from the beauty of the curves. One is, therefore, inclined to

suggest in this case that the continuity of the building line or, at most, only a very slight variation in setbacks would have made a better architectural composition.

There is no reason why a continuity of the building line should not be maintained around culs-de-sac. The same reasons as mentioned in the previous example apply here. Moreover, aesthetically, the group effect of the cul-de-sac arrangement of houses is particularly strong, consequently, it is inadvisable to site houses in any manner which reduces such effect.

Irregular setbacks are more logical along streets of slight curvature or along straight streets of some length. Even in these cases drastic variations in setbacks are seldom, if ever, necessary in order to achieve the desired aesthetic interest. A valid reason for randomization occurs when existing trees are located in such positions that in order to preserve them, varied setbacks have to be employed. Unfortunately, the all too common practice is to remove all trees from the site by a bulldozer and then to employ some arbitrary setbacks.

The design which uses an irregular pattern of setbacks requires that adherence to the plan be maintained when houses are actually built since even a slight departure from the planned composition may change a pleasing originality into an unaesthetic casualty.

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The matter of siting garages deserves attention in subdivision planning, primarily as far as zoning regulations and the architectural appearance are concerned. From the standpoint of a standard zoning by-law or ordinance, a garage means any building, space or enclosure in which one or more motor vehicles are kept. Regulations may specify that a private garage may be located in any side yard provided that such garage shall then be subject to the same restrictions respecting setback and side yards as the building which it serves. Also, it may be required that the garage shall not be located within a certain minimum distance from any window or door of the house. Less common are cases where garages accessible from streets are subject to such severe restrictions that their location in back lanes is practically enforced.

Zoning regulations permitting the siting of a garage may be planned in a number of ways as is illustrated in the plan. The architectural implications in terms of the three dimensional house-garage compositions formed should be visualized without much difficulty. The least successful are cases where a garage is attached to the street side of the house as this composition emphasizes the inherent clash in scale that exists between a bulky garage and the relatively small size of a single family dwelling. Garages or carports located in side yards make the best attainable compositions, particularly when breezeways or porches have been used as interesting and useful links with the house.

On some irregularly shaped lots the location is such that the longer dimension of the garage is in a line parallel to the street. A garage attached in this manner takes its usually unattractive door away from the street facade. Moreover, it enables the achievement of visual opulence of the composition by enhancing its horizontality.

In spite of the variety employed in the siting of garages, the subdivision is architecturally successful. A contributing factor was, no doubt, the size of lots almost all of which are 90 feet or more wide. Lots of less generous width would have dictated restraint in the amount of individuality in house-garage formations.

Some planning authorities justifiably believe that 55 feet is a minimum width of the lot on which to permit a garage accessible from the street. If on lots of such narrow width individualistic house-garage formations are employed, the overall architectural effect of the street is likely to be doubtful.

A team of graduate students of civic design at Yale have made a study of the cluster type of subdivision plan. The objective was "to discover how the mass-produced house (40 feet by 25 feet) could be arranged on the site in a more pleasing and more functional manner than now seen all over the United States. ... The minimum group unit is to consist of four houses, while the maximum is ten houses. This is based on considerations of child play, access, parking, grouping and aesthetics. To stay within the realm of practicality, this idea could only be put in practice if it could be shown that it is more economical in site planning for the builder and more useful to the householder in function. Thus a land allocation of 12,000 square feet per family was maintained, approximately 3,000 feet of which is the common property contribution to the central lot area and parking space. This leaves the individual home owner with a lot averaging 9,000 square feet (100 by 90) and with the freedom to arrange it for privacy if desired, without garage, driveway, sandboxes or swings.

In a typical plan there is a large saving in roadways (as much as 77% in some cases) even though the paved area for automobiles within the unit is larger than absolutely necessary for automobile use, to allow for children's vehicles and to diminish the possibility of their venturing out into the collector street for play." (3, p.22-3)

This design might be considered one of the most controversial of the examples shown. The answer to the question of whether or not the designers stayed within the realm of practicability will in practice depend largely on the point of view taken by the municipal authority and by the average householder. Any subdivision, no matter how economical it may be for the builder, requires official approval. One can well imagine objections being raised against the walkway access to

houses for reasons of fire protection, utility installations and repairs. The road link between the street and the parking area is likely to be questioned from the traffic point of view.

The average householder, although he is more probably to accept progressive ideas than the municipal authority, is likely to expect a garage or carport to be located on a lot, particularly if 9,000 square feet large. With respect to the lots planned, a discrepancy attracts attention. The indicated size of 90 feet by 100 feet, in terms of proportion, does not correspond to the plan where the relation of width to length appears to be approximately 1 to 2.

The value of this study lies in its avantgarde ideas. As architectural compositions, the group units make an interesting and original contribution.

The following contribution from Finland is an example of originality employed in the design of a site which is richly endowed with densely treed areas. The manner in which the designer integrated the subdivision with the existing natural amenities presents a noteworthy example of creative design.

The illustrations reveal the distribution pattern of the trees over the site. Apart from densely treed parts worthy of preservation, one observes a number of irregularly shaped pockets with only sporadic trees and one realizes that Nature provided these areas as unique enclosures for development. This configuration lends itself ideally for an irregular plan arrangement, each enclosure inviting the location of a cluster of residences and offering to them a truly beautiful environment.

Hexagonal lots have been used and these, as demonstrated, lend themselves well for the formation of clusters of varying sizes and shapes. Hexagons enable the breaking up of property lines both on the perimeter of the cluster as well as in its interior in a manner more suitable for the preservation of occasional trees within the building area than would be the case if property lines were straight.

Hexagons have afforded a considerable freedom in the siting of residences and garages. This advantage, however, was not fully exploited, garages being detached from residences and the relationship between the two elements has been repeated somewhat mechanically in the design. The location of garages is such that these present themselves as undesirable architectural intruders in the pleasant garden spaces around the dwellings.

Each cluster is served by a turn-around which forms the dead-end of a minor residential road. The road layout is a good illustration of a functional system in which a number of minor roads feed into the major roads, the latter forming the main traffic collectors.

One cannot deny that this kind of development would involve increased costs of construction with respect to utility lines and a greater amount of roadway per dwelling than a conventional subdivision of higher density. The compensating values, however, should be too obvious to mention.

Units of farm lands in the Province of Quebec and elsewhere usually take the form of elongated and narrow parcels, particularly when bordering on water-fronts. The subdivision of such sites and their neighbourhood integration are difficult for reasons of the geometric form and their accessibility only along the narrow side. The location of existing utility lines may further aggravate the situation.

In this plan an existing sewer line has been used as a path through the subdivision providing access to dead-end streets for fire trucks and snow ploughs. The required width of easements makes the path unnecessarily wide and renders a number of lots unusable. The value of these as open spaces is questionable. Fire service and snow removal vehicles demand hard surfacing of the path, thus increasing considerably the overall amount of paved areas.

CHAPTER TWO

MIXED DEVELOPMENTS

In 1943, a team of architects associated with the Housing Standards Section of N.H.A. worked out a project for a "mixed rental neighborhood" for 1,000 families of Federal workers in Washington, D.C. The project did not receive official support from the N.H.A., presumably for reasons of its avantgarde approach which challenged the wisdom of established zoning regulations. The designers stated: "Under present regulations it is not possible as a rule to mix high apartment buildings with single-family dwellings, yet this might be highly desirable." (4,p.79) They proposed a new approach to zoning with regulations based principally on overall density restrictions.

The project was visualized as a small town, or a "neighbourhood community" in which the variety of dwelling types provided would satisfy the needs of a variety of family types. The hypothesized family types and the kinds of accommodation proposed for them were presented pictorially in a chart in Figure 23. The advantages and disadvantages of the dwelling types included in the chart were appraised as follows:

Elevator apartments offer maximum services, most economic use of various mechanical equipment, and abundance of space around the buildings themselves. They suffer, however, from the lack of privacy, and they do not provide space for gardening. Children are not wanted. Apartments (2 and 3 storey) afford access to the ground and a private garden area within the communal open space. They do not, however, offer privacy. They are not suitable for children and for those who are disturbed by them. Row houses, of all house types, achieve the most intensive use of the land, streets and utilities with adequate privacy; they afford a private garden which, however, is narrow. Through access is difficult and there is a considerable closeness to neighbours. Semi-detached houses add to the pretense of privacy on account of the exterior openness, afford a more flexible plan arrangement of the interior. They require considerably more land and utilities than the row houses, yet the amount of privacy they offer is still limited. Single houses, if properly planned, assure quiet and privacy, their only disadvantage being the cost.

The site, located just inside the District of Columbia line, is 175 acres of woodland. Apartments were proposed in locations where best advantage could be taken of views and where woods were thickest. The areas to the south were to be partly cleared to let in the breeze, and for use by the tenants. Areas to the north which will be in shadow much of the time, were to be left in their natural state. Sites for detached houses, individually built, were left on the roughest and most thickly wooded south slope. With larger individual lots, this section was meant to be developed with narrow gravel roads, thus permitting the preservation of the character of the landscape and enhancing the views from the apartments. Sites for all row and double houses were given access to green strips through which pedestrian paths lead to the central open space.

Extending beyond the banks of the brook, an attractive park area was provided in the project. Adjoining this area are sites for an elementary school with public library, and a fairly complete commercial center comprising a restaurant, a swimming pool and a moving picture house.

Those who know how difficult it is to lay out such an unpretentious site as this, i.e., fairly restricted in size and shape and accessible from one side only, will appreciate this excellent piece of civic design by Mr. Paul Mauger.

The central turn-around may be regarded as the key to the design. Apart from being a useful traffic device, the turn-around has permitted the routing of the two streets to be adjusted to the shape of the site. Further, it has enabled the planning of two short streets which, in this case, lead to a better composition than the alternative, one long street.

Spaces enclosed by dwellings as well as spaces between dwellings are architecturally balanced; and the whole development forms a unified composition which is enhanced by a judicious location of trees. A careful study of the details of this sensitive design is recommended as a rewarding lesson in site planning. The setbacks are neither random, undisciplined, nor drastic. They are employed with restraint, a sense of scale, and for a definite architectural purpose, i.e., to introduce interest to the building line and to help shape the main space enclosures. In each of the three courtyards, the building line arrangement is different yet it is aesthetically logical.

The architectural policy employed in the distribution of the dwelling types, namely, the duplexes, triplexes and rows is sound and practical. Details such as the slight curvature in the street alignment, differentiation in the spacing of dwellings, the angles at which buildings or groups of them are set, the row of trees arresting the view along the street are constituent parts of the composition. They are worthy of the attention they received in this design.

In Canada, row houses are only reluctantly used. The main objection seems to be the fear of dullness and sameness. Critics who object to row houses on these grounds might ponder the monotony of our single-family districts, typified by long, seemingly endless streets bordered on either side by nondescript dwellings crowded on narrow lots.

This illustration shows an above average row house layout which, as an exception, was designed by an architect. In view of the restricted site and the unfortunate alignment of existing streets, it would be difficult to achieve a fundamentally better composition. As one compares this layout to that from Buntingford, one realizes the significance of the design subtleties employed in the latter.

CUL-de-SAC COURTS

Figure 27

Groups of dwellings may be made accessible by cul-de-sac or entrance courts located off residential streets. Cul-de-sac courts may advantageously be used for the purpose of developing the interiors of blocks. When applied to odd-shaped parcels of land, these courts may offer better land utilization for lots than the use of the usual cul-de-sac street. Courts, however, should not be used as a means for excessive lot utilization as exemplified in this plan.

Some of the lots are grossly under-dimensioned and the spacing of dwellings is on the whole inadequate. The rear gardens are, in some cases, almost non-existent. Under these circumstances, the proposed informality in the grouping of the dwellings is architecturally unsound and it means little more than a distortion. In view of the obvious limitations of this site the house type "A" has been ill-dimensioned. The excessive length of this house, apart from making the building difficult for grouping purposes, has necessitated an extravagant amount of court paving.

This illustration may serve as a good, though modest, example of a curved street which has been properly related in scale to the court situated opposite it. A considerable skill is needed to lay out a curving street of aesthetic merit. The radius of a curving street should be within reasonable limits, otherwise lots are difficult to plan. Properly, the radius should be determined by such factors as the use of the street, its width and gradient, and the obstructions on its convex side. A recommended minimum radius is one which affords an unobstructed view for at least three hundred feet. An inappropriate use of a curve obtains when two straight sections of a street are connected by a short curve.

In the example shown, the gracefulness of the curve is enhanced by the gradual rise in the terrain and the street facade benefits by the use of connecting elements situated between the houses.

This plan represents a part of the residential area of the New Town of Harlow in Britain. Three-storey apartments and two-storey row houses were used as dwelling types. The proximity of the plan area to the center of town explains the employment of fairly long row houses and the resulting increased density. The apartments are set at an angle to the street in order to reduce their architectural "weight" with respect to a long facade of row houses in front of them. A judiciously curved street serving both these dwelling units introduces further interest to the composition.

In spite of the length of row houses, pleasant space enclosures have been achieved. In this respect, the court served by a dead-end street in the Western part of the layout and the alignment of buildings along the street in the Eastern part are worthy of mention. In each case, the designer has used a slight angle at which he has set the rows of dwellings in order to dramatize the perspective terminated by the vista of a court. The location of the court around the bend of

the street in the Eastern part shows how one can reduce, visually, the length of a street aligned by dwellings of the same kind. As compared to a monotonous arrangement of row houses which is so typical of many North-American projects, the view along this street will be ever-changing and it will offer a great deal of "architectural surprise." This scheme should dissipate the fears of monotony which is ordinarily expected when the employment of apartments and row houses is proposed in a housing scheme for reasons for the economic advantages offered by these dwelling types.

CRAWLEY (East Sussex)

Figure 30

This design, a part of the residential neighbourhood of the British New Town of Crawley, received a housing medal awarded by the Ministry of Housing in 1952. The author, A.G. Sheppard Fidler, achieved a variegated composition of row houses, semi-detached, and single-family dwellings. The North part of the plan is an illustration of a successful architectural organization of these dwelling types into a block with the main approach road located on the perimeter. A pleasant feature of this arrangement is two courts, accessible from the peripheral road by footways and turn-arounds, and linked with garages and children's playground. These courts merit attention as intimate and balanced space enclosures of architectural unity.

On the perimeter of the block the street facades present equally harmonious compositions. For example, one cannot help noticing the manner in which a group of three single-family houses and seven semi-detached dwellings along the North edge of the block are welded into an architecturally disciplined unit. The building line formed by these dwellings is full of interest yet the variations in setbacks are moderate. The variety in the treatment of the spaces between the street and dwellings may be noted. In some cases, front gardens broken by hedges were employed, in others, stretches of unbroken lawns were used. Whether or not the dimensioning of turn-arounds and streets, or the size of garage compounds would satisfy the North-American requirements is believed to be irrelevant. The example has been shown as an illustration of the desired architectural approach in housing design.

This residential development from the British New Town of Hatfield is another good example of a well-balanced composition in which semi-detached dwellings, row houses and apartments are successfully combined. The two major elements of the design, namely, the street layout and the arrangement of buildings complement each other in this composition. It may be appropriate to emphasize that satisfactory results in civic design can only be achieved when these elements have been conceived in unison and when their proposals are worked out as one creative operation.

Apartments have been judiciously sited either near street intersections or in places where they interfere least with the other dwelling types, yet where they enjoy an extension of outlook and sufficient properly landscaped open space. The development features fairly small, intimate blocks. There are a few larger blocks with their interiors developed and these have been made accessible by means of short turn-arounds. Spaces around street intersections are well-defined architecturally. The views along streets have been arrested, sufficiently large buildings or groups of them being used as interesting vistas. Trees in proposed locations make an important ally in the composition. They help define the various space enclosures by occupying strategic positions in between buildings, they channel the views along the streets thus enhancing their perspective, or they act as vistas. Planted as clusters or as individual trees, they provide the desired natural amenities within the open spaces.

ENNISKILLEN (Scotland)

Figure 32

One of the advantages of this design is a considerable reduction in the amount of roadway which has been effected by placing a number of short row houses perpendicularly to the street and by making them accessible by walkways only. Such arrangement reduces the street frontage and, consequently, economizes on the length of road paving. The walking distances from the street are not excessive and the dwellings enjoy privacy, quiet and a sufficient extension of the diagonal views. The planning of dead-end streets, the arrangement of buildings around them, and the design of walkways are particularly interesting details of the project. The dwellings, whether fronting onto the street or not, are imaginatively grouped, the composition as a whole being unpretentious. The two public buildings planned for the future, the school in the center and the community center on the perimeter of the development, are suitably located.

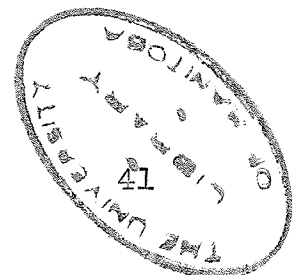
The project is well-fitted into the peninsula which offers exceptionally attractive natural amenities. As evident from the plan, the bountiful trees permeate harmoniously the development. Whether for reasons of topographic conditions or of deliberate policy, it is gratifying to see that a substantial part of this scenic site was left as open space.

CHICAGO (West Pullman, Illinois)

Figures 33 - 34

In 1943, the Chicago Planning Commission put out a publication for illustrative purposes, showing how the built-up area of West Pullman might be resubdivided if all land, or most of it, could be reassembled. The two schemes, the "gridiron" and "neighbourhood" design, are shown as a comparison.

In the redevelopment, each proposed school site is combined with a park, one of which is made large enough to serve as common park-athletic field. The four shopping centres were designed to meet the "neighbourhood" requirements in regard to safe and easy access by pedestrians, and to off-street parking areas offering ready access to motorists.



CHICAGO (WEST PULLMAN, ILLINOIS)

AREA ANALYSIS	ACRES	% OF TOTAL SITE AREA
STREETS AND ALLEYS	75.47	21.15
PARKS, SCHOOL SITES, AND BUFFER STRIPS	57.16	16.10
CHURCH SITES	6.13	1.72
INDUSTRIAL AREA	8.25	2.31
SHOPPING CENTRES	20.77	5.77
RESIDENTIAL AREAS:		
APARTMENT	17.86	
ROW HOUSES	57.60	
SINGLE-FAMILY	114.25	
TOTAL RESIDENTIAL	188.81	52.95
TOTAL SITE AREA	356.59	100.00

Seventy-five acres were taken up by streets in this neighbourhood scheme as compared to 115 acres in the previous plan. This saving of 40 acres greatly adds to the area of land which may be used productively for homes or business, and would materially reduce the cost of installation and maintenance of these streets.

CHICAGO (Illinois)

Figures 35-36

Another piece of research work was done by the Chicago Planning Commission to study the economic and functional advantages of the "neighbourhood" design over the standardized "gridiron" layout. The area in question was free for future development and the Commission was interested in selling the neighbourhood concept which would permit the enjoyment of urban life without hazards, and of quiet, pleasant homes within easy walking distance of community facilities.

For a fair economic comparison, areas for parks, schools, public buildings, churches and retail stores were kept the same size.

Although the gridiron has provided areas, in rectilinear block arrangement, for these facilities, it would be necessary to cross many streets which are potential traffic carriers, to reach schools and parks. Aside from the fact there is not any differentiation made between major and minor residential streets, this block system is aesthetically uninteresting, and lacks character.

The planned scheme represents an integrated community made up of five distinct neighbourhoods, individual in character, and with an elementary school and playground constituting the centre of each. To reach schools, children need to cross only a minimum number of streets, and these are local.

The recreation facilities are the centre of the community educational and social life.

Adjacent to the high school and closely related in function is a proposed central grouping of public buildings and retail shops to serve the whole community.

CHICAGO, ILLINOIS

	GRIDIRON	NEIGHBOURHOOD
TOTAL NET AREA	1031 ACRES 1.6 SQ. MILES	1031 ACRES 1.6 SQ. MILES
STREETS	161,521 LIN. FT. 244.6 ACRES (24%)	133,882 LIN. FT. 195.4 ACRES (19%)
ALLEYS	129,146 LIN. FT. 47.4 ACRES (4%)	67,765 LIN. FT. 25 ACRES
NEIGHBOURHOOD PARKS AND ELEMENTARY SCHOOLS	34.8 ACRES (3.3%)	33.3 ACRES (3.2%)
COMM. PARK AND HIGH SCHOOL	28.6 ACRES (2.7%)	29.8 ACRES (2.9%)
PUBLIC BUILDINGS	2.9 ACRES	8.6 ACRES
SMALL PARKS AND WALKWAYS	10.7 ACRES	12.5 ACRES
BUFFER PARKS	63.2 ACRES	62.5 ACRES
PAROCHIAL SCHOOL	8.7 ACRES	9.1 ACRES
CHURCHES	4.0 ACRES	4.8 ACRES
SINGLE-FAMILY AREAS	260.6 ACRES	266.9 ACRES
GROUP DWELLING AREAS	228.0 ACRES	265.1 ACRES
APARTMENT DWELLING AREAS	65.0 ACRES	77.6 ACRES
RETAIL-COMM. AREAS	32.9 ACRES	55.8 ACRES
TOTAL DWELLING UNITS	6,837	7,753
ESTIMATED POPULATION	23,000	26,000

The Sherbrooke District of Edmonton, Alberta, was laid out in 1949 as a typical "gridiron" pattern, but it was later abandoned and replaced by a new scheme.

In the new scheme, a reduction in lengths of both local streets and service lanes was achieved, thus saving home owners unnecessary street construction and maintenance costs. There were, however, slight increases in some utility costs as compared to the unplanned scheme, but these factors were far outweighed by the above-mentioned savings.

The planned scheme incorporates the advantages defined in the "neighbourhood" concept, i.e., adequate provisions for schools, churches, shops, and play space within the centre of the subdivision.

Traffic conditions are also safer because of differentiation of major and minor streets, and discouragement of through traffic.

SHERBROOKE DISTRICT

EDMONTON, ALBERTA

	GRIDIRON	NEIGHBOURHOOD
INTERNAL ROADS	37,960 LIN. FT. 57.2 ACRES	27,600 LIN. FT. 41.7 ACRES
UTILITY AND SERVICE LANES	27,460 LIN. FT. 12.6 ACRES	23,400 LIN. FT. 10.7 ACRES
PUBLIC SCHOOL SPACE	2.14 ACRES	6.0 ACRES
CATHOLIC SCHOOL SPACE	--	4.0 "
RECREATION LEAGUE AREAS	--	2.0 "
PARKS	--	4.0 "
CHURCHES	--	1.5 "
SHOPPING AREA	1.9 ACRES	1.5 "
AGRICULTURAL ZONE	19.0 "	--
LIGHT INDUSTRY	6.56 "	--
PLANTED ISLANDS	--	11.6 ACRES
ONE-FAMILY DWELLINGS	1,068 UNITS 122.6 ACRES	896 UNITS 112 ACRES
ROW HOUSING	--	245 UNITS 17.5 ACRES
APARTMENTS	--	190 UNITS 9.5 ACRES
TOTAL ACREAGE OF SCHEME	222 ACRES	222 ACRES
TOTAL POPULATION	3,400	5,324
GROSS DENSITY	4.8 DWELL UNITS/ACRE	5.7 DWELL UNITS/ACRE
NET DENSITY	6.27 DWELL UNITS/ACRE	7 DWELL UNITS/ACRE

APPENDIX

KEY:

S	Single-family houses	CC	Community Centre
SD	Semi-detached houses	RE	Restaurant
R	Row houses	SCH	School
A	Apartments 3-storey high	SH	Shopping Centre
E	Existing streets and highways	SS	Service Station
P	Proposed streets and highways	CP	Car Parks
W	Walkways	P	Park

This is a proposal for a new neighbourhood on a site bounded by the river along one side and by existing residential developments on the other sides. Existing and proposed highways delineate the planned area. A system of walkways, shown only in a portion of the plan, links the dwellings with the public buildings.

Items for discussion:

1. Was it necessary to include the lot lines in areas devoted to single-family dwellings?
2. Is the grouping of single-family houses and their setbacks satisfactory?
3. What should be said about the relationship between single-family houses and the other types of dwellings?
4. Is the accessibility and the location of public buildings convenient and desirable?

ANSWERS

1. The lot lines must be shown in any subdivision since they define physically and legally the limits of land ownership. Without these lines, a proposal cannot be called a subdivision for it does not provide a basis on which to appraise its practicability and conformity to existing municipal regulations.
2. The grouping of dwellings is chaotic and architecturally disorganized as a result of a drastic randomization of setbacks. The dwellings that have been turned at an angle to the street are particularly ill-sited.
3. In a number of cases, single-family houses are placed too close to semi-detached dwellings, row houses or even apartments. Such a bad location policy could only result in a decrease of the real and saleable value of the houses so obviously misplaced.
4. Accessibility by car is inferior to that by foot. Driving to the public buildings would involve trips around the neighbourhood. Such detours are discouraging and wasteful. The assumption that the neighbourhood dwellers will take to pedestrianism is unrealistic. A large percentage of car ownership in a community such as this can be taken for granted. If safety of the pedestrians were the designer's reason for not providing car access across the open space, a roadway with an underpass could have been a simple solution. In view of the size of this neighbourhood, it is reasonable to assume that the public buildings will also serve the adjacent residential areas. Therefore, the excessive distances of these buildings from the highway are not desirable.

KEY:	E-	Existing streets and highways
	P-	Proposed streets and highways
	EL-SCH	Elementary school
	P&G	Parking and garages
	PRG	Private green
	PUG	Public green
	R	Row houses
	TL	Tot lots

In this project row houses constitute the only dwelling type. Accommodation provided by them ranges from 2-4 bedroom units of the usual standard. Garden space allotted to each row house is labelled as "private green," the rest of open space is "public green." Tot lots and an elementary school are provided but no other community buildings. The proposed circulation system including existing and planned highways, streets and other forms of access is self-explanatory from the plan. To justify the repetition of this dwelling type over such fair-sized area it was assumed that the disadvantage might be compensated by an attractive layout. Only a portion of the plan is drawn up in detail.

Items for discussion:

1. What may be said of the layout of row houses and of their accessibility?
2. How would one appraise the landscape design on the basis of what is shown in the plan?

ANSWERS

1. In a design of this nature the designer has to strive for suitable architectural enclosures of space formed by buildings. These enclosures, however, have to be laid out in such a manner that approximately an equal amount of open space, and a fairly good extension of outlook, is apportioned to each building. In the light of this axiom, the layout is satisfactory only in general. In detail, inequalities with respect to the foregoing objective occur in a number of places in the plan. Notwithstanding these drawbacks, the design presents interesting layout ideas.

Accessibility of buildings is, on the whole, inadequate, particularly when provided for by short-length drives without a properly dimensioned turning space. Even the culs-de-sac, giving access to groups of buildings, are somewhat under-dimensioned. One can easily locate in the design two groups of almost identical size, one served by cul-de-sac and the other by the previously mentioned drive. By comparison, the latter cannot be regarded as sufficient in size. In some cases, when a row house is located perpendicularly to the street, no car access has been planned for such a situation is obviously unsatisfactory and particularly in the case of a long row.

Labelled as "parking and garages" (P&G), strips of land of varying sizes appear here and there along the streets and the drives. A considerable number of buildings, or groups of buildings, have been left without any space for parking and garages. Where space has been devoted to the accommodation of cars, the indication on the plan lacks sufficient detail.

2. Landscape design means more than a mere dotting of the land with a few trees and bushes. It includes all the ramifications associated with the best possible distribution of all open spaces within the project area. Objection can be raised against the impracticability of the distribution of open spaces in the project. The public green areas are unnecessarily split into too many fragments whose maintenance would be both difficult and costly. Private green shows undesirable "jogs"; tot lots are undefined with respect to landscape elements; the over-all length of footpaths is excessive, some of them being superfluous or devious. One would wish to see more trees and hedges in places where they might enhance the architectural composition.

PROJECT 3

Figure 41

KEY:

SH	Shopping centres	E-SCH	Elementary school
CH	Churches	CC	Community centre
T	Theatre	MH	Municipal hall
ST	Stadium	SK	Skating and curling rink
H-SCH	High school	E-	Existing streets & highways
CE	Cemetery	P-	Proposed streets & highways
HO	Hotel	SD	Semi-detached dwellings
A	Apartments	S	Single-family houses
R	Row houses	P&G	Parking and garages

This is a proposal for a suburban residential neighbourhood, located in an attractive peninsula. The land is fairly level with portions of it sloping gently towards the river. Drainage and the layout of utilities present no problem. Apartments, row houses, semi-detached dwellings and single-family houses have been employed in the scheme. The design has been based on the superblock idea since it employs a major peripheral traffic route from which minor residential streets branch off in a manner apparent from the plan.

Items for discussion:

1. Is this scheme a satisfactory example of a superblock?
2. Are the neighbourhood public buildings well located with respect to the neighbourhood as a whole; and are they well related to each other architecturally?

ANSWERS

1. This scheme is not a successful superblock. The peripheral traffic route is so extended in length as to be impractical and inconvenient because of the extensive detours incurred in order to reach most points of destination within the neighbourhood. As far as loops are concerned, some of them are too small from the point of view of street utilization. When they are grouped in a cluster, the arrangement is objectionable traffic-wise. For instance, one such cluster consisting of five loops is joined with the peripheral route by only one street which acts both as egress and ingress for 119 single-family dwellings, 17 row houses, one apartment, one shopping centre and one large community centre.

For these disadvantages, there is a negligible compensation in that vehicular traffic has been eliminated from the centre of the neighbourhood. The only achievement worthy of note in this scheme is the demonstration that the site, on account of its size, shape, and location does not lend itself to being planned as a superblock.

2. It is correct to assume that those community buildings which are expected to serve the needs of the whole neighbourhood should be located as close to its centre of gravity as possible. In the plan, however, the churches, the municipal hall, the community centre, the curling rink, the stadium and the high school are as far away from such centre as the site permitted.

The majority of the buildings pay little or no architectural attention to each other. Instead of being grouped to form compositions, they are merely scattered over the site.

KEY:

S	Single-family houses	EL-SCH	Elementary school
SD	Semi-detached houses	N-SCH	Nursery school
R	Row houses	PG	Playground
A	Apartments (3-storey high)	G	Garages
TL	Tot lots	P-	Proposed highways

The project area, at present vacant land, has been bought by a syndicate of private developers who plan to develop it as part of a new neighbourhood. Adjacent vacant land East and West of the project area, though not owned by the syndicate, will accommodate the rest of the neighbourhood. A designer commissioned to work out this preliminary sketch had to employ single-family houses, semi-detached dwellings, row houses and apartments. The syndicate plans to offer single-family houses and semi-detached dwellings for sale as private homes, row houses and apartments are intended to be rental units. Public buildings comprise an elementary school and two nursery schools.

Items for discussion

1. Is the building line formed by semi-detached houses satisfactory?
2. Has the cul-de-sac in the centre of the site been properly planned?
3. What may be said about the location of garages in the centre of traffic turning spaces?

ANSWERS

1. The building line is not satisfactory. One does not achieve a correct architectural composition merely by alternating haphazardly the perpendicular and the parallel siting of a building with respect to the street. The spaces enclosed by buildings in such positions are bound to appear disorganized.
2. This cul-de-sac street is not properly designed, its length is excessive and its integration with the adjoining streets is unsatisfactory from the traffic point of view. The loop from which this street branches off would have a fairly heavy traffic commitment even if the cul-de-sac were not attached to it. The "mixture" of the dwelling types around the cul-de-sac is such that the single-family houses would find themselves isolated and their real values would be adversely affected by their proximity to the adjoining rental row houses. The placement of row houses only along one side of the street and of semi-detached dwellings and single-family houses along the other represents too sharp a division which can hardly contribute toward stability of real values. It is doubtful if the terrain conditions in this case warranted the use of a cul-de-sac street.
3. The location of garages in this position would justifiably invite violent protests from engineers for reasons of safety, visibility and the facility of traffic flow. Obviously, constant use of the turning space surrounding the garages by the considerable number of cars likely to be accommodated, would obstruct the normal flow of traffic, the fire engine, and the service vehicles. In addition, the garage located in such a focal position would hardly act as a satisfactory element architecturally.

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