

# THE BRITISH EXPERIENCE



Essays introduced by Peter Self

Published by Charles Knight for the  
Town and Country Planning Association

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## Changing goals in design : the Milton Keynes example

LORD LLEWELYN-DAVIES

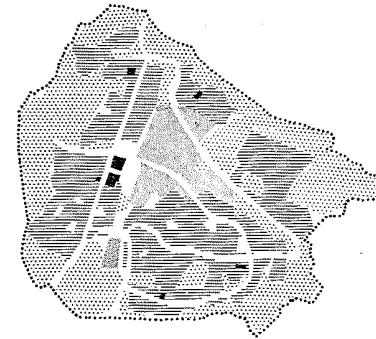
THERE is a surprising lack of serious theoretical discussion of new-town design. In a paper of mine, "Town design" in the *Town Planning Review* of October 1966, there were 21 bibliographic references. But I could find none dealing with design in general terms, with the possible exception of Buchanan's report on a new city for South Hampshire, which raised some significant general issues.

Most of the available material on new-town design is embedded in the master-plan proposals for individual towns. These proposals were presented as responding to the special problems of the particular site, and usually little attempt was made to argue the planning ideas on a more general basis. Nevertheless, there are general ideas implicit in all of the plans, which were not derived from ad hoc considerations.

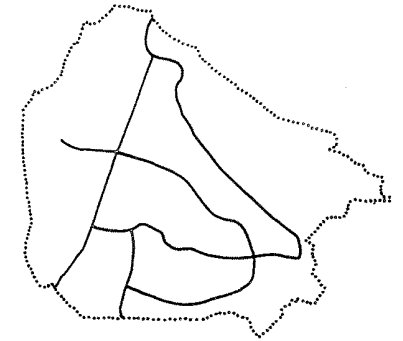
### *Designs from 1945 to 1966*

The first new towns in Britain, planned immediately after the war, represented the final development of the ideas inherent in the original garden cities of Letchworth and Welwyn. These towns were intended to be limited in size and surrounded by substantial areas of open country. They were planned to provide a complete urban environment including housing, employment and recreation. The planners of these towns were able to work within what they believed to be a fixed boundary. Therefore they saw their task as the arrangement of space within this boundary to give a coherent and attractive town. As a general rule the land uses were sharply demarcated. Housing was split into neighbourhoods, separated by large areas of open space. Neighbourhoods were supposed to encourage the formation of social grouping and each neighbourhood usually had a local centre. The characteristic road network consisted of radials and ring roads. The radials connected the various neighbourhoods to the centre, and the ring roads were designed to carry cross-movement and relieve some of the traffic pressure on the centre. Owing to the assumption that the town was a self-contained entity the connection between it and the outside world took the form of a limited number of main road connections running in towards the

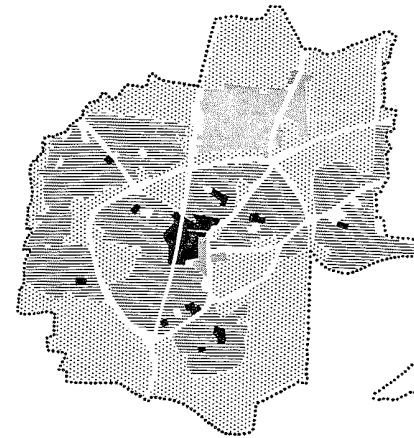
### CHANGING GOALS IN DESIGN: THE MILTON KEYNES EXAMPLE



Welwyn—Principal land uses.  
Area 4,317 acres. Population 50,000









Welwyn—Main road network



Crawley—Principal land uses.  
Area 6,047 acres. Population 50,000



Cumbernauld—Main road network

KEY		CENTRAL FUNCTION		RESIDENTIAL
		INDUSTRY		MAJOR OPEN AREA
		URBAN MOTORWAY WITH GRADE SEPARATED INTERSECTIONS		
		PRIMARY ROAD NETWORK		

Road systems shown are the main roads only. In the case of Welwyn, Crawley and Hemel Hempstead the main roads are generally 3 or 4 lane carriage-ways with traffic lights or roundabouts at intersections. In the later towns, Cumbernauld, Skelmersdale, Runcorn the main roads are urban motorways forming the primary network with grade-separated intersections.

Fig. 16. Welwyn and Crawley—principal land uses. Welwyn and Cumbernauld—main road networks.

centre. The densities of these towns were thought of as being low, although it has subsequently been demonstrated that they were very much the same as the densities in old-established towns of similar size.<sup>1</sup>

Crawley is a good example. In its plan the separation of neighbourhoods by open space can be clearly seen. There is a strongly developed town centre, and industry is grouped in a single large area. The road plan shows radial roads, linked by a ring route with a spine across its centre—a very characteristic solution.

The first generation of new towns was attacked from several directions. Many architects and some planners argued that their low density limited “urbanity” as buildings were too little concentrated to give any coherent architectural effect. Sociologists criticised “the neighbourhood” concept as being without justification in terms of observed patterns of human interaction. In response to such criticisms the new town of Cumbernauld was planned in a rather different way.<sup>2</sup> It was strongly centralised and planned to a higher density than towns such as Hemel Hempstead, Harlow or Stevenage. The neighbourhood concept was dropped and an effort was made to get a very high proportion of the whole population living within walking distance of a single concentrated centre. A rather similar approach was used in the design of Hook.<sup>3</sup>

During the period which elapsed between the planning of the first towns and the planning of Cumbernauld and Hook, substantial advances had been made in the study of motor transport. Predictions became available for the amount of traffic likely to be generated towards the end of the century when every household will have one car, and some two cars. The design of these later towns provides for road-systems capable of carrying this predicted heavy traffic without congestion, even at peak hours. The concentrated, highly centralised planning at Cumbernauld and Hook led to complex and expensive road networks, and the attempt to provide for the predicted traffic in terms of highway design produced complications.

A criticism of Cumbernauld and Hook, as models for future towns, was that they depended on complex multi-level city centres which would be difficult to alter or extend should the town expand. Further, the highly centralised plan, with maximum densities at the centre, led to road networks whose capacity for traffic fell off with distance from the centre. This characteristic obviously tends to prevent shifts in land use, such as would be needed if a town is to undergo normal growth.

The period immediately following the second world war was one of wide-sweeping reforms and innovations. These included the establishment of effective public control over development through the Town and Country Planning Acts, the establishment of the National Health Service, and a vast expansion of education at all levels. The building of new towns was a significant element in the social and economic policies of the time. The goals at which the first generation of new towns aimed were derived from these policies.

Now, 20 years later, social policies are different, and inevitably the purpose and role of new towns must reflect this change. Twenty years ago

social policy had the broad aim of providing an acceptable pattern of life for a majority—who at that time were not enjoying adequate housing, education or health-care, or were in other respects deprived. Social reformers were confident in prescribing the conditions for satisfactory living, and felt no great need to provide alternatives for people to choose from. Today, partly because of rapidly increasing national wealth and partly because of the success of the social policies introduced after the war, we face different problems and new policies are emerging to meet them.

Family incomes (in terms of real purchasing power) will certainly double, and may well treble, in the next 30 years. I need not emphasise the difference this will make in life-styles.

Increasing wealth, and better, more prolonged, education have led to a demand for freedom to choose between alternatives in housing, work and recreation. Providing for this is a new goal in town design.

At the other end of the scale we now recognise new dimensions in the problem of poverty. It now appears that, for a minority, poverty will not disappear as a result of increasing national wealth, nor even as a result of present policies for redistributing wealth. Poverty now seems to need multiple attack and to depend, even more than we thought, on patterns of urban living, transport and location.<sup>4</sup>

How do these broad changes actually come through as objectives for design? This can be seen by examining the goals set for the planning of the new city of Milton Keynes.<sup>5</sup>

These were reached by a series of seminars and discussions extending over three months, and preceded all design work on the plan. The goals were:

1. Opportunity and freedom of choice
2. Easy movement and access, good communications
3. Balance and variety
4. An attractive city
5. Public awareness and participation
6. Efficient and imaginative use of resources

These goals, when spelt out, include some of those implicit in first-generation new towns, modify some and reject some. They also include new aims.

#### 1. Opportunity and freedom of choice

This has profound implications for design. It leads to the rejection of the “neighbourhood unit”—so long an established component of every plan. It means that the plan should provide for people to exercise choice between alternative schools, shops, work-locations and services of every kind. It rejects planning based on defined catchment areas, in favour of widely overlapping areas of service, from widely distributed nodal points.

#### 2. Easy movement and access, good communications

This is a corollary of goal 1. If there is to be real freedom of choice, there must be freedom of movement. This means a change of emphasis in new-town design, putting a higher value on quick, free, direct access from any point in the town to any other point. Good communication has always been a goal in design, but it was thought to be satisfied if transit from home to certain defined locations was good. At town scale these would be the city

centre and the industrial estate. At neighbourhood level the only convenient journey might be to the neighbourhood centre. The new goal asks for more than this—for fast, convenient movement in any direction across the whole town. It rejects solutions which limit freedom of choice in mode of transport, or which lead to some areas of the town being significantly better served than others.

### 3. Balance and variety

This is not new. Every new town has aimed at social balance, and variety. But it is now restated with stronger emphasis. The first new towns had a job to do: to take population "overspill" resulting from metropolitan slum clearance and rebuilding. This they did, and if they did not succeed in getting a full cross-section of social classes, it was still well worth doing. But today, the sheer, quantitative need to accommodate "overspill" no longer exists. The main social purpose of a new town today is to assist in breaking down the urban poverty syndrome—the vicious centrifuging of population by social class—which has created the urban ghettos of America, and could do in Britain. The full design implications of this goal are not yet clear, but it does mean that it must be designed to attract, accept and tolerate every social and racial group. It must be designed to give people what they want when they first come, and provide for their needs and desires to change rapidly as they settle down. This means, for example, that local shopping might be essential at one time, but redundant soon afterwards. Therefore, plans must provide locations where social and commercial services can spring up or die away in response to need.

### 4. An attractive city

Early new towns aimed to be, and indeed generally were, attractive. But they did not depend for their survival on their attraction. "Overspill" agreements, and the general shortage of housing, made their population build-up fairly secure. But today's new towns have no such advantages. They really have to compete, both for industry and for population, with older towns and suburbs, and the economic levels are by no means stacked in their favour. Hence, like the private-enterprise new towns in America, they need to market the life they have to offer. This is a real challenge to design. One result is that the plan must permit the town to have a flexible response to market conditions. No one can foresee just what sort of towns, industries and services will be most wanted in the future—but we can plan to permit a variety of futures, to meet expressed demands, as they arrive.

### 5. Public awareness and participation

This is now an accepted part of planning—but its impact on design has not yet been fully realised. If we are serious, as we must be, in inviting people to participate, then they must be able to influence the outcome. A new town takes about 25 years to build. Its only inhabitants to begin with are those already living in the area at designation. Later, year by year, the new arrivals settle in the town in increasing numbers. When the master plan is being made, the incoming population has not yet arrived and cannot participate. Therefore, if their wishes are to have any effect, the plan must leave as many decisions as possible open for the future. It must

be indeterminate rather than prescriptive. This really calls for a new attitude to design. Instead of making a physical plan to fit our concept of the good life, we have to adopt a more modest and agnostic position. We have to try to design a physical infrastructure, for transport, services and other fixed elements, which permits the maximum freedom for future social patterns to develop. This has to be the aim in future new-town design, and it is a difficult and challenging concept. Of course, design alone cannot ensure full participation, much else is needed in political and social action. But it can make room for it to be a reality.

### 6. Efficient and imaginative use of resources

Obviously, this has always been an aim in new town design. But until now it has never been very real, because there was no adequate means of testing design against the economic criteria. I believe that the plan for Milton Keynes is the first for any British new town to have been tested against a cash-flow analysis. Rightly used, economic analysis is a most valuable design tool, indeed it is vital if the public interest is to be properly served. The real mystery is why it has taken us 25 years before we started to use it in the design of new towns.

#### *Designing to meet new goals*

Although the six design goals just described were worked out for Milton Keynes, they are obviously of general application. If the reasoning behind them is right, then they are the goals for any present or future new town. (Of course, the arguments for them may be debated and I hope they will be. As they largely control design we need to be very sure that we get them right.) Supposing they are accepted then the next questions are: first, can design meet them? And second, what will such a town be like? I shall try to answer these questions by using the example of Milton Keynes. But of course, Milton Keynes is only one example, and its plan is related to its special circumstances. So it is only one way of responding to the new aims in town design.

The development of a master plan for a new city is a complex and difficult task. It involves the interaction of many approaches and arguments, symbolised by a team of 20 to 30 professionals from a very wide range of disciplines. I shall not try to trace the full story of the Milton Keynes plan, this can be read in the report.<sup>6</sup> But I will pick out certain salient points in the plan relevant to the present discussion. These are:

1. Land-use and transportation patterns
2. Public transport and roads
3. Nodes as activity centres
4. Visual character

#### 1. Land-use and transportation patterns

Milton Keynes has been designated as a city of 250,000 inhabitants. Its area is 22,000 acres, roughly square in shape, and something over five miles across. Its size, shape and density define the problems of land-use and transportation. Size and shape are determined by the designation, but density is a question of policy. For reasons set out at length in the report,

NEW TOWNS: THE BRITISH EXPERIENCE

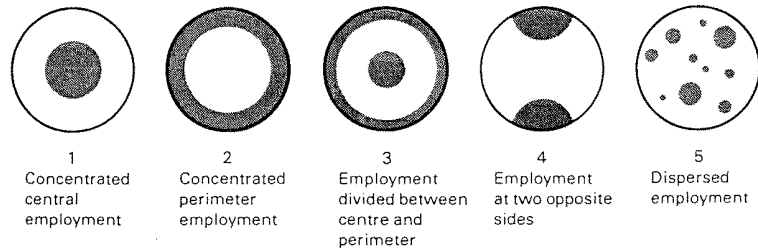


Fig. 17. Milton Keynes: alternative urban forms.

we concluded that net residential densities should be planned at an *average* of eight homes per acre over the city as a whole. (There will be, of course, wide variations in local densities.) This figure is somewhat lower than recent new towns but is similar to that proposed by Buchanan in the South Hampshire study. Land uses other than housing are generally in line with the standards adopted in other new towns. On this basis the land budget showed that the designated area of 22,000 acres just fitted the new city, and would be wholly taken up.

As a first step, five alternative urban forms were compared. Each showed a different disposition of employment, ranging from complete concentration to a fairly general dispersal. For the given conditions of size, shape and density, calculations were made for *total person mileage* on trips from home to work, and *the total road mileage* needed to cater for these journeys, convenience of each city form to its people and the cost of investment in its roads. This comparison showed dispersal of employment to be most advantageous, giving much the lowest investment cost. It also ranked high in convenience, equalled only by complete concentration of all employment at the centre. The study also showed that even if urban forms with highly concentrated employment were used, there would still be too little traffic on any single corridor to justify investment in fixed-track systems of transport. These calculations took no account of the local conditions, and therefore apply generally to any new town of similar size, shape and density. They suggest that dispersed employment carries no penalties in terms of transport cost and convenience, but actually confers benefits.

The land-use plan for Milton Keynes accordingly shows a wide distribution of employment and service centres, which assists in providing variety and freedom of choice. Major sites for industry are spread over the entire area, and small-scale industry is encouraged within the residential areas, to provide additional opportunities for women to work near their homes. Major non-industrial employment centres, such as the health complex and the higher education campus, were treated as focal points, and deliberately located away from the city centre—which is naturally a major employment centre in itself.

2. Public transport and roads

Despite indications from the study of urban form, all types of public

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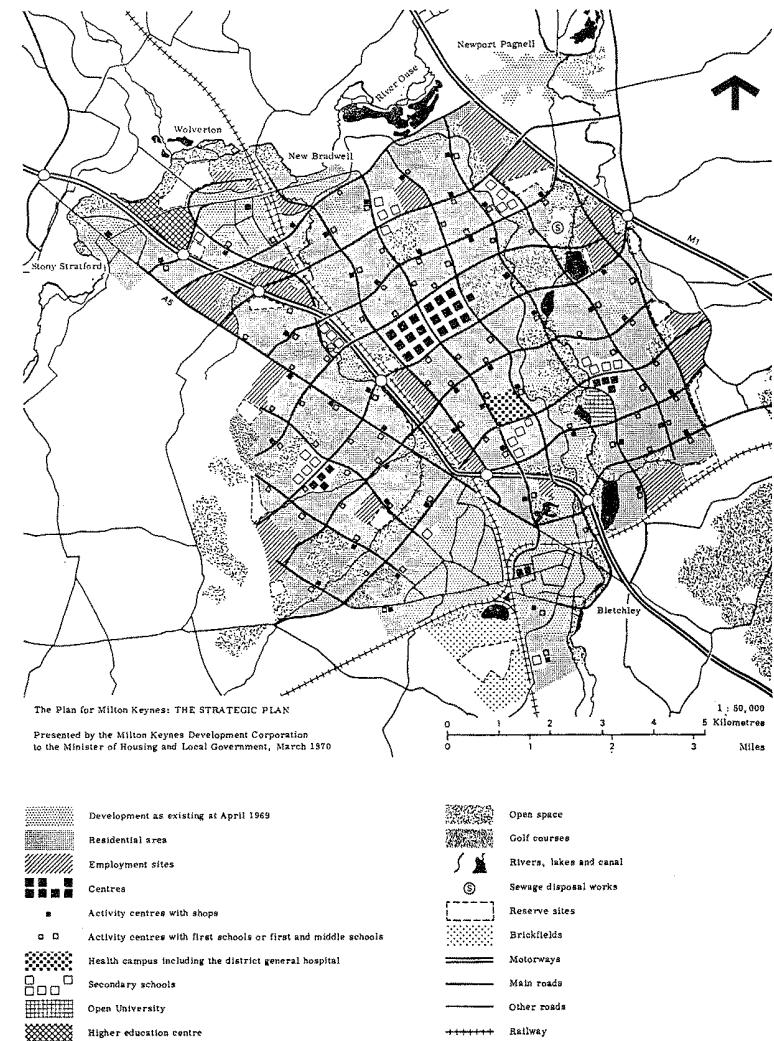


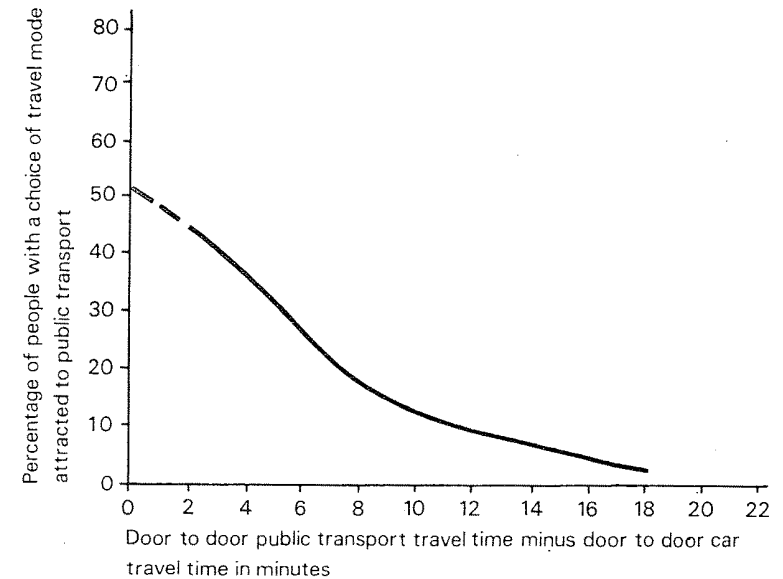
Fig. 18. Milton Keynes: the strategic plan.

transport, including fixed-track systems, were considered and compared for Milton Keynes. This analysis is fully described in the Milton Keynes report, and I can only summarise its results here. But, as the conclusions run counter to some accepted ideas in planning, I shall try to present the main points in the reasoning, step by step.

The goal of free choice in mode of transport was taken as starting point. This means that it is assumed that no deliberate steps are taken to prevent the use of cars—either by designing for road congestion or by restricting parking. (Of course, we might have found this goal unattainable, and were prepared to if it so turned out.) Then the demand for public transport can be predicted. First, it is generally established that even when full car-ownership is attained there will be 20 per cent of journeys to work by public transport—by old people, incapacitated people, young people, drunken drivers who have had their licences removed, and some who just don't like driving. Over and above this there will be additional passengers who have chosen public transport in preference to driving. It is also pretty certain that their choice depends almost exclusively on the relative time of the journey *from door-to-door* by the alternative modes of travel. Unless the time by public transit is close to that by car very few people will choose it voluntarily. Hence, the numbers travelling by public transit will vary with the journey time, door-to-door. For a city with the characteristics of Milton Keynes, the best possible public transit system might attract about another 10 per cent of travellers, giving a total 30 per cent of journeys by public means. (But to keep far-out possibilities under consideration some comparisons were made with 50 per cent journey by public transit.) But this argument of course applies only when full car-ownership is reached—until then there will be higher demand. So the public transport system must be flexible. It has to provide a service which grows as more people settle in the city, eventually reaches a peak, and later declines as more people take to using cars. Finally, those needing or choosing public transit will not be the poor. They will come from all groups in the city. This means that to give the service needed, public transit must penetrate everywhere. It won't do just to have it serving part of the town, if its genuine social purpose is to be met.

The first analysis showed the relation of cost (total social cost) and passenger volume for a range of systems, with the social cost of travel by private car included in the comparison. This suggested that under the conditions obtaining in Milton Keynes fixed-track systems could not compare with systems using buses. It also showed that the cost of bus services fell off rapidly as the size of the bus goes up.

The next analysis showed cost and service, as measured by door-to-door travel time. This comparison put even the best of the fixed-track systems out of court, as it gave a worse service at higher cost than any of the bus systems. More interestingly, that quality of service falls steeply as larger buses are used, but does not improve dramatically as bus size goes down below 25-seaters. It suggests that the "best buy" would be somewhere around the 25-30 passenger bus. Finally, estimated journey costs were



Source: Peat Marwick Kates & Co.

Fig. 19. Percentage of people choosing to travel by public transport.

calculated and compared with journey time. This suggests that a rather good service can be obtained for very reasonable cost with small buses.

A typical journey to work by bus in Milton Keynes is shown to take about 25 minutes. The service would run on all main roads, giving penetration to all parts of the city. Thus, so far as public transport is concerned, the goal of high accessibility everywhere seems attainable.

The road network at Milton Keynes is unusual for new towns, in that the main roads are at ground level without multi-level flyover intersections. (There is only one motorway-type route, substituting for the present A5 where it passes through the city.) The main roads are spaced at roughly one kilometre intervals. This spacing is critical in the design. The traffic-loading coming onto particular main roads is proportional, for any given density, and land use, to the area enclosed by these roads. The area is, of course, proportional to the square of the linear dimension. Thus small increases in road spacing can produce large increases in traffic-loading.

At Milton Keynes' densities, one square kilometre produces loadings appropriate to dual-carriageway main roads with colour-light-controlled intersections. It also results in traffic levels within residential areas which conduce to safety. Peak-hour traffic using the local roads within a one kilometre square need never exceed 250 vehicles per hour. This has been shown by Building Research Station studies to be a level at which accidents

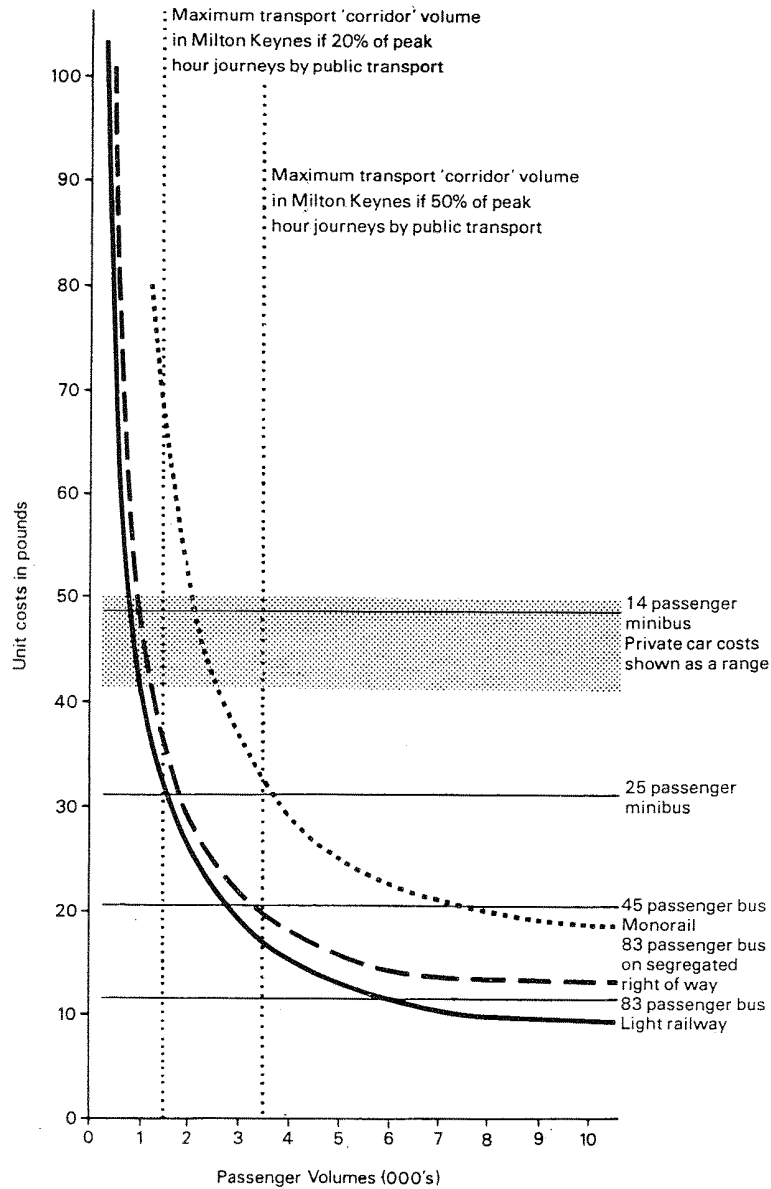


Fig. 20. Capacity and cost of public transport types. Private car costs are shown as a range. The maximum unit costs for private cars attribute a proportion of the vehicle capital costs to the work journey. The term transport "corridor" refers to the area within an acceptable walking distance which could be served by a single transport facility.

CHANGING GOALS IN DESIGN: THE MILTON KEYNES EXAMPLE

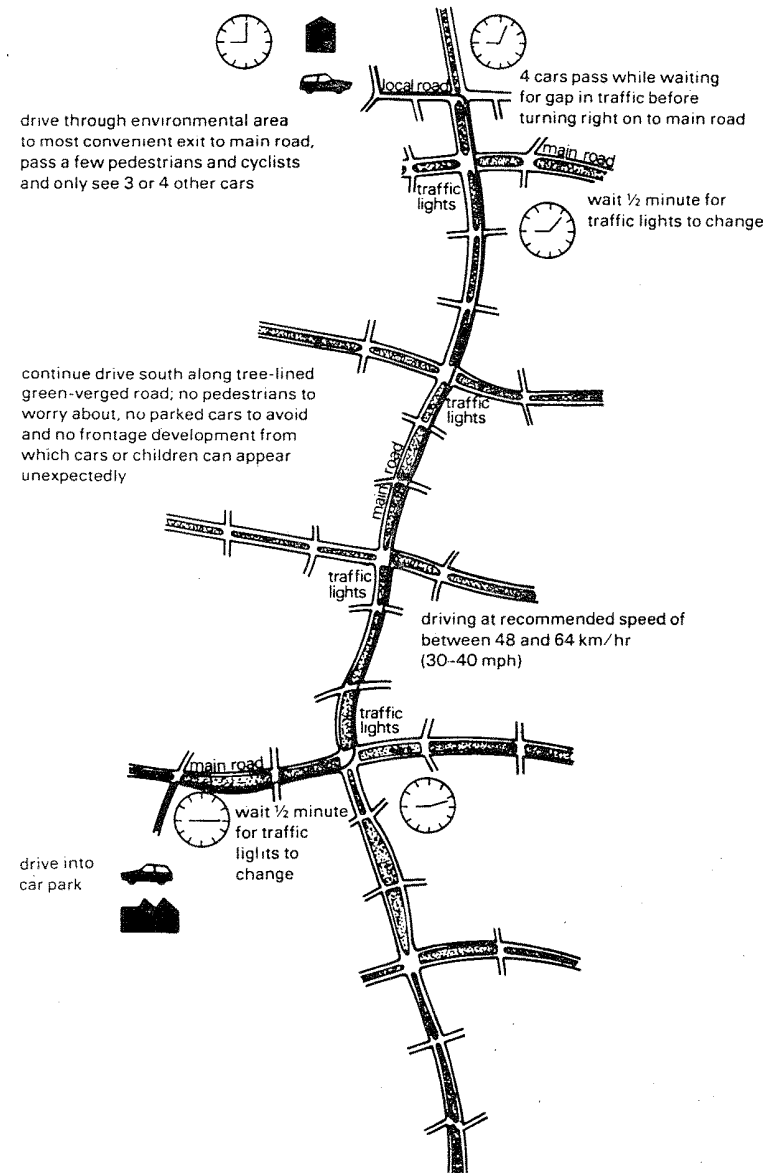


Fig. 21. A typical journey to work by car in Milton Keynes. The door-to-door journey of about 5 kilometres takes about 15 minutes, of which 1 minute was spent waiting at traffic lights.

rarely occur, and at which there is no real conflict with pedestrian movement. (The really dangerous roads, where most pedestrian casualties occur, are the collector roads, intermediate between main roads and local roads. These have been eliminated from Milton Keynes.) A typical journey to work by car, at peak-hours, shows that it will take about 15 minutes, of which about one minute may be spent in waiting for traffic-lights to change. The road system is cheap to build, and can be built in stages to meet changing needs. It will give free movement by car to and from all points in the city. It provides choice of route, not one only route, and generally short, direct connection from point to point. It therefore seems that there are no insuperable technical or economic problems to providing for full, free use of private transport in a new town. Nor does such provision prevent the simultaneous provision of good and cheap public transport.

Thus the goals of accessibility and good communication can be met in a fairly simple and straightforward way. At Milton Keynes provision is made for the inclusion, if and when they become practical, of advanced technologies in transport. But the indications are clear: these technologies will have to provide a service which is genuinely competitive with personal transport if they are to make a useful contribution in the situation of a new town.

### 3. Nodes as activity centres

The goals of choice and opportunity are reflected in the location of activity centres at Milton Keynes. Instead of being placed in the centres of defined neighbourhoods, these are placed round the edges of residential groupings, at communication nodes. They are found at the point where the bus stops, and where pedestrian routes cross, over and under, main roads. They thus serve two or more neighbouring groups of homes. Equally, two or more different local activity centres are in walking distance from each home. Activity centres will be where the first schools, the pub, the local shops and other facilities occur. Not all of the possible locations for these local centres may be used; this will reflect the demand for service at any place and time. They won't all have the same package of facilities—some may develop some things, and others will be different. This will help to achieve the goals of variety and freedom of choice. As they will be visible from the main roads they will contribute to the character and attraction of the city—which will not turn its back on the traveller as some new towns are apt to do.

### 4. Visual character

What will a new town, such as I have been describing, look like? First of all it will be to a great extent a garden city. Except in a few locations such as the city centre, there will be more emphasis on trees and grass than on solid buildings. (This does not necessarily mean lack of urban character as the college area at Cambridge shows.) As you drive along a main road your view will alternate between parkland and buildings, as local activity centres are passed. This means that the quality of landscape design will have a critical influence. Perhaps even more than architectural quality, landscape quality will determine the impact of the new city.

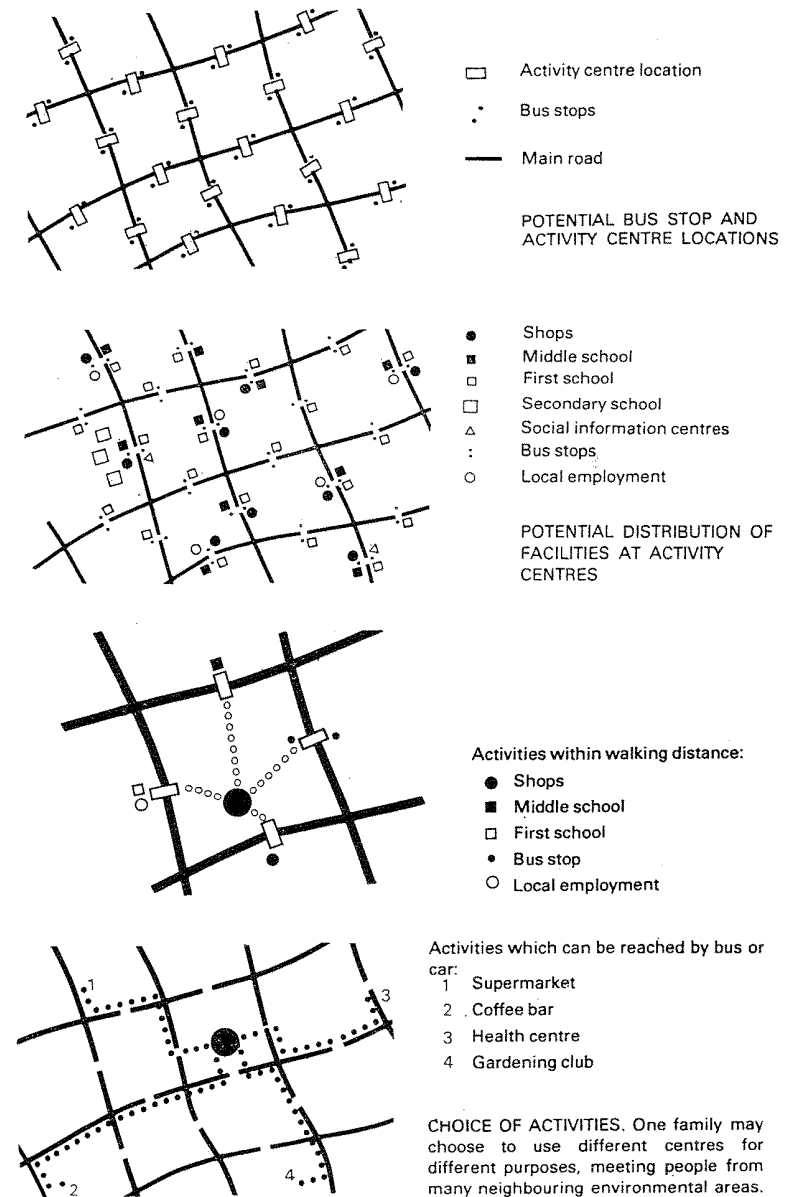


Fig. 22. Activity centres, Milton Keynes.



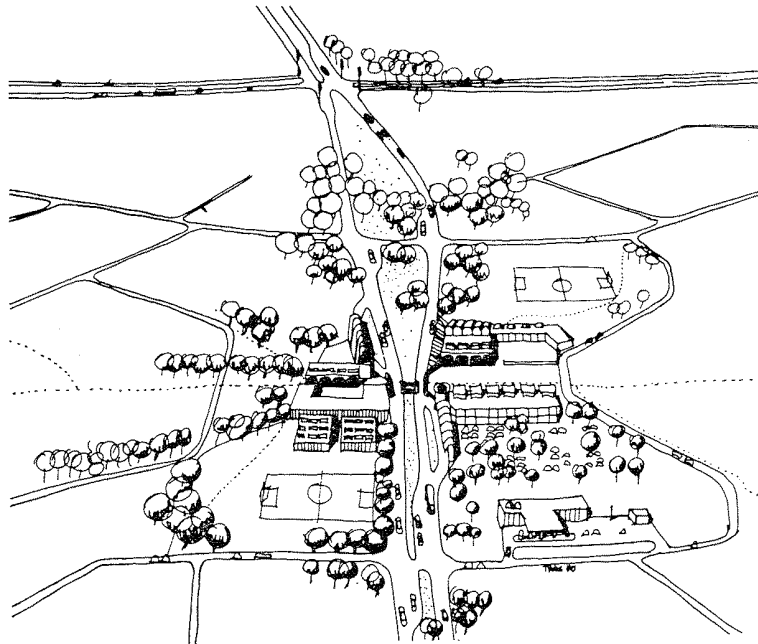


Fig. 23. Aerial sketch of a typical activity centre. Housing areas, contiguous with the centre, are not shown.

At the beginning of this section I posed two questions: Can the new goals for new-town design be met? And what will such a new town look like? The answers suggested by the experience of planning Milton Keynes are “yes” and “green”.

*Notes and references:*

<sup>1</sup>R. H. Best, *Land for New Towns*, TCPA, 1964.

<sup>2</sup>*Cumbernauld New Town, Planning Proposals*, Cumbernauld Development Corporation, 1959.

<sup>3</sup>*The Planning of a New Town*, London County Council, 1961.

<sup>4</sup>*Poverty in Spread City*, a study of constraints on the poor in Nassau County. Organisation for Social and Technical Innovation, August 1969.

<sup>5</sup>*The Plan for Milton Keynes*, Vol. 1. Milton Keynes Development Corporation, March 1970.

<sup>6</sup>*The Plan for Milton Keynes*, Vols. 1 and 2. Milton Keynes Development Corporation, March 1970.

## 12 Shops and shopping

SIR FRANK PRICE

DURING the past few years my development corporation has had to consider in great depth how the commercial pattern of our area should be laid down.

Telford, at the time of writing, has a population of over 80,000 people. They are dispersed around the designated area in a number of well-defined, long-established localities such as Dawley, Wellington and Oakengates, each with its commercial centre.

These three commercial localities, situated at the corners of an upturned triangle within the designated area, presented a permutation of ideas. They also presented pressure groups whose concern ranged from a fierce self-interest to simple civic pride. It was inevitable, therefore, that the question “was it absolutely necessary for a town to have a town centre?” would be posed. I concluded that it was, because whatever sort of plan the planners care to dream up—grid, radial, linear, or whatever—if the town is to be a success, there has to be a focal point which identifies the town in people’s minds. It is by their centres that towns and cities are recognised and, in most cases, remembered. When someone asks the obvious question: “Where is Telford?”, it is not too easy to frame an answer, even though Telford includes all the places I have mentioned, together with one or two others.

*Role of the town centre*

The fact is that people always identify a town with its town centre, and the impression of a town or city given to visitors is often determined by the quality and scale of its centre. When people think of Coventry, in the main they think of the new city centre and the cathedral. The same applies to Nottingham and Leicester, and all other great cities of renown. In the case of Telford, therefore, the corporation saw one of its priorities as being the establishment of a town centre as soon as commercially possible, which would provide the town with a central identity.