

HOBART PAPERS IN PRINT

All Capitalists Now GRAHAM HUTTON (2s 6d)

1. *Resale Price Maintenance* B. S. YAMEY (fourth edition, 6s max.)
2. *To Let?* NORMAN MACRAE (3s 6d)
3. *Balance-sheet for Take-overs* ANTHONY VICE (3s 6d)
4. *Pensions for Prosperity* ARTHUR SELDON (3s 6d)
5. *Anything but Action?* A. P. HERBERT (3s 6d)
6. *Unions in Prosperity* FRANK BEALEY & STEPHEN PARKINSON (3s 6d)
7. *Company Law for Shareholders* GUY NAYLOR (3s 6d)
13. *A Prosperous Press* IAIN COLQUHOUN (5s)
15. *TV: From Monopoly to Competition - and Back?* WILFRED ALTMAN DENIS THOMAS & DAVID SAWERS (second edition, 7s 6d)
16. *Ordinary Shares for Ordinary Savers* RICHARD KELLETT (5s)
18. *The Wage Fixers* HENRY SMITH (5s)
19. *Libraries Free-for-All?* A. P. HERBERT (6s)
21. *Freedom for Fuel* GEORG TUGENDHAT (7s 6d)
22. *Farming for Consumers* GRAHAM HALLETT & GWYN JAMES (6s)
23. *Transport for Passengers* JOHN HIBBS (7s 6d)
25. *Education for Democrats* A. T. PEACOCK & JACK WISEMAN (6s)
26. *Taxmanship* COLIN CLARK (6s)
27. *Monetary Policy for Stable Growth* E. VICTOR MORGAN (5s)
28. *Vacant Possession* JOHN CARMICHAEL (6s)
29. *Policy for Incomes?* F. W. PAISH & JOSSLEYN HENNESSY (6s)
30. *Land in the Market* D. R. DENMAN (4s)
31. *Money in the International Economy* GOTTFRIED HABERLER (6s)
32. *Taxing Inheritance and Capital Gains* C. T. SANDFORD (6s)

HOBART PAPERS IN BOUND VOLUMES

- Vol. 1. *Radical Reaction* (Nos. 1-5) HUTTON, YAMEY, MACRAE, VICE, SELDON, HERBERT. 1961 (hard covers, 25s)
- Vol. 2. *Ancient or Modern?* (Nos. 8-12) PREST, FULOP, CLARK, HEATH, ROBERTSON. 1965 (hard covers 25s, paperback 10s 6d)
- Vol. 3. *Freedom or Free-for-All?* (Nos. 14, 17-20) LEES, MEADE, SMITH, HERBERT/HARRIS, ILERSIC, 1965 (hard covers 25s, paperback 10s 6d)

(Each volume includes postscripts by the authors and an introduction by RALPH HARRIS).

For further information about details of subscription services, ETON and OCCASIONAL PAPERS, etc., please write to the address on the inside front cover.

Paying for Parking

G. J. ROTH

HOBART PAPER 33

SIX SHILLINGS

INSTITUTE OF ECONOMIC AFFAIRS

The Institute was formed in 1957 as an educational trust. Its chief aim is to raise the standard of economic discussion by spreading knowledge of basic principles and market analysis. Authors are invited to examine the role of competitive markets and show how business and public policy can best serve the interest of the community.

Its work is assisted by an advisory council which includes:

Colin Clark	Professor Alan T. Peacock
Professor Stanley Dennison	G. J. Ponsonby
Dr R. F. Henderson	Professor A. R. Prest
Graham Hutton	George Schwartz
Professor John Jewkes	Henry Smith
Professor E. Victor Morgan	Professor Jack Wiseman
Professor B. S. Yamey	

The Institute is independent of any political party or group. It is financed partly by sales of its publications and partly by voluntary contributions. Subscription is open to all interested individuals and organisations: associate membership (individual or corporate) is at the invitation of the Trustees.

<i>General Director</i>	<i>Editorial Director</i>
Ralph Harris	Arthur Seldon
<i>Secretary and Treasurer</i>	<i>Research Officer</i>
G. E. Blundell	Hamish Gray
<i>Editorial Officer</i>	
Michael Solly	

Books and paperbacks published by the Institute are listed on the inside back cover and Hobart Papers on the back cover. Details of other publications including Eton and Occasional Papers from:

THE INSTITUTE OF ECONOMIC AFFAIRS LTD

EATON HOUSE, 66A EATON SQUARE, LONDON SW1

Telephone BELGRAVIA 2294

Paying for Parking

G. J. ROTH

M.A., B.Sc.(Eng.), A.M.I.C.E.

Published by

THE INSTITUTE OF ECONOMIC AFFAIRS

1965

First published July 1965

©

THE INSTITUTE OF ECONOMIC AFFAIRS LIMITED

Printed in Great Britain by

SEVERN RIVER PRINTING CO LTD - WORCESTER

Set in Monotype Garamond series 156

PREFACE

The purpose of the *Hobart Papers* is to contribute a stream of authoritative, independent and readable commentary to the discussion of economic opinion and policy. Their general method is to analyse the mechanism and institutions which best enable consumers to direct the use of resources.

One of the resources that we have most conspicuously failed to use effectively in an age of increasing travel by motor vehicles is space for parking them and for allowing movement in and through towns. The problem is of more general interest because space used for parking vehicles or for roads cannot also be used for building; if parking space is not available the owners or users of vehicles may not be able to conduct their affairs, and if parking space is excessive or inadequate there may be avoidable under-use of, or pressure on, public transport. Space seems to be overcrowded in some places and under-used in others. Yet there seems to be no commonly accepted general solution to the most effective use of scarce space for parking.

The Institute therefore invited Mr. Gabriel Roth, who is both a civil engineer and a transport economist, to examine the fundamental conditions of the supply of, and the demand for, parking space and to offer proposals for policy. His unique combination of acquaintance with the engineering problems and his capacity to apply economic analysis to a problem which is not only one of physical planning but of the allocation of scarce resources between alternative uses, has yielded an especially valuable survey of the problem. In distinction to the solutions usually offered by physical planners and social engineers, Mr. Roth has proposed a structure of market prices designed to ensure that scarce parking space is used in varying circumstances of time and place to satisfy most urgent requirements. He also examines the variegated forms of demand for parking space and the kinds of suppliers who might be called into activity if parking space were priced.

Hitherto in Britain the common approach to parking has been to suppose that it is a 'social service' that must be provided by

public authority at low or zero price. In the course of his analysis and discussion Mr. Roth demonstrates the confusion that follows from this approach and the wastes that have been caused by the attempts to ration a scarce resource without the use of prices. He shows that unless prices are used the alternative is not to make space available to all motorists who want it without paying for it but to ration it by administrative decree or regulation which can be arbitrary, capricious and wasteful.

Mr. Roth's *Hobart Paper* demonstrates the application of micro-economic analysis, that is, an examination of the reaction of individuals in the supply of and the demands for car parking space. And his solution, a structure of prices designed to equate supply and demand, illustrates the effectiveness of analysing the responses of individuals (persons, councils or companies) as buyers and sellers in a market. This—or any other—solution could not have been found by macro-economic analysis of the 'total' demand for parking space and its 'total' supply.

If public policy is to follow the lines proposed by Mr. Roth there will need to be many changes in the public attitude to parking space as a free good and to the use of market prices as an orderly method of administering and allocating scarce space.

Without necessarily accepting Mr. Roth's analysis and conclusions for itself and the members of the Advisory Council, the Institute warmly commends his cogent and persuasive paper as a refreshing contribution to a discussion of public policy on a subject long obscured by wishful and muddled thinking.

THE EDITOR

THE AUTHOR

GABRIEL ROTH was born in Manchester in 1926. He studied civil engineering at Imperial College, London, and economics at Christ's College, Cambridge. After spending his civil engineering apprenticeship with Sir William Halcrow and Partners he went to the Road Research Laboratory as a Rees Jeffereys Fellow to study some of the economic benefits obtainable from road improvements. This work stimulated an interest in the economics of roads and traffic, and eventually he found his way to the Department of Applied Economics in Cambridge where he spent three years investigating the economics of car parking. He is now working in London as a consulting transport economist.

He has written articles on the application of economics to transport and traffic in the *Journal of the Town Planning Institute*, the *Town Planning Review*, and the *Westminster Bank Review*. He has lectured and broadcast on transport economics and was a member of the Smeed Committee on road pricing which reported in 1964.

ACKNOWLEDGMENTS

My thanks are due to Mr. Gilbert Ponsonby, Reader in Transport at the London School of Economics, Mr. F. G. Pennance, Head of the Economics Department at the College of Estate Management, Sir Ian McTaggart and to the Editorial Director and staff of the I.E.A. for help, encouragement and advice; and to Mr. J. T. Duff, Assistant Chief Engineer, Ministry of Transport, and to the Ministry, for permission to reproduce some of the tables from his paper 'Traffic Management in Towns' presented to the Seventh International Study Week in Traffic Engineering in London in September 1964.

G.J.R.

CONTENTS

PREFACE	<i>The Editor</i>	3
THE AUTHOR		5
ACKNOWLEDGMENTS		6
I STATING THE PROBLEM		9
Basic principles		10
Willingness to pay as a criterion of need		10
Parking subsidies:		12
effects on		
(i) car users		12
(ii) public transport		13
(iii) commercial car parks		14
(iv) trade		14
The irrelevance of motor taxation		15
II STREET PARKING		16
Methods of allocating the available space		17
(a) 'First come, first served'		17
(b) Time limitation		17
(c) Pricing		17
Parking prices		19
Parking meters		22
Parking meter costs—increasing meter revenues—		
enforcement difficulties—parking meter revenues—		
shortcomings of conventional meter schemes—		23
Other methods of charging		
(a) The ticket-issuing parking meter		26
(b) 'Personal' parking meters		27
(c) A road-pricing meter used as a		
personal parking meter		27
The disposal of meter profits		28
How many spaces to provide?		30

III	OFF-STREET PARKING	33
	Possible suppliers	34
	Private enterprise—local authorities— a 'National Parking Authority'—	
	Conclusions	
	Planning requirements	38
IV	THE PROBLEM OF RESIDENTS	41
	Street parking	41
	Off-street parking	43
V	PARKING RESTRICTIONS AS A MEANS OF RELIEVING TRAFFIC CONGESTION	45
	The Buchanan Report	45
	The logic of a parking tax	46
	The operation of a parking tax	48
	The problem of non-parking traffic	49
	Conclusions	51
VI	SUMMARY AND CONCLUSIONS	51
	QUESTIONS FOR DISCUSSION	53
	FURTHER READING	54
	APPENDICES	57
I.	The costs of providing off-street parking space	57
	TABLE: Examples of the costs of providing off-street parking space	59
	GRAPH Showing the relation between parking costs and land costs	60
2.	Estimating the demand for off-street parking space	61
3.	Devices for pricing the use of congested roads	62
	TABLES	
I	Parking meter utilisation in London	21
II	The spread of parking meters in Britain	22
III	Parking meter revenues in Greater London	23
IV	Breakdown of meter income and expenditure	24
V	Parking meters in London: income, expenditure and surpluses used for off-street car parks	29

I. STATING THE PROBLEM

There can be few vehicle users in Britain who are not acutely aware of the parking problem. In residential areas an ever-increasing proportion of the road space is used for garaging cars by day and by night. In the centres of cities, shoppers are finding more and more difficulty in reaching their destinations and lorries in unloading their goods. Essential services such as street cleaning—and even fire fighting—are often hindered by parked cars.

Despite the general awareness that 'something must be done', surprisingly little is done to provide more parking space. A motorist in Britain takes it for granted that he can buy—or hire—a car at any time, so long as he is prepared to pay the cost. He knows that he can buy petrol at most times of the day or night, and that on arrival at his destination he can expect to find a hotel room. But there are few cities in which the traveller can expect to find convenient parking space during working or shopping hours.

It is all too easy to blame the shortage on the inadequacies of the central government, local authorities, or property developers. Most of the people concerned are highly intelligent and fully aware of the problem. The main trouble is that it is not at all clear who is responsible for providing the remedy.

The basic cause of this confusion is that our society has not made up its mind whether parking space should be provided at a market (commercial) price or as a 'social service'. Our parking troubles stem from the common assumption that parking space should be provided at the expense of 'the community' and that it should not be charged for when used. But, as soon as attempts are made to provide parking space on this basis, the question of who should pay becomes unavoidable. As the question does not receive a clear-cut answer, the parking facilities are not provided.

The object of this *Hobart Paper* is to treat parking space as a 'normal' commodity, such as gas or electricity, and to follow the implications of this 'commercial' or market approach for prices and investment policy. Although our society accepts commercial criteria for the allocation of most goods and services—even the most militant of motorists have not proposed that petrol should

be supplied free to all out of general taxation—the idea that parking space can be usefully treated in the same way as office space, hotel rooms, or theatre seats, seems strange to most people. Readers are therefore asked to put aside all preconceptions in approaching the subject of this *Paper* and to remember only that the economic principles upon which it is based are taken for granted in most other fields.

Basic principles

If parking space is to be treated as an ordinary commodity, what are the principles we should use to determine the number of spaces to provide and the price to be charged?

The consequences of the scarcity of parking space are not different in kind from those of the scarcity of hotel rooms, or of warehousing space. To deal with the parking problem we must recognise two fundamental principles:

- a) that existing parking space in towns should be made available to people with most need¹ of it, and
- b) that since space in towns is scarce, the demand for it must compete with the demand for other land uses; space should be allocated to car parking only if car parkers need it more than people who wish to use it for other purposes.

The first principle relates to the (short-term) allocation of existing parking space among would-be parkers. The second relates to the (long-term) problem of how much space in a town should be allocated to parking, and how much to other purposes—shops, houses, schools, streets, and so on. The application of these principles is discussed in Sections II and III, in relation both to on-street and to off-street parking. But before these sections there are two preliminary hurdles: (a) the assessment of ‘need’ and (b) the relevance of road-use taxation.

Willingness to pay as a criterion of need

One of the biggest problems facing contemporary society is how to allocate limited resources when the demand for them is virtually unlimited. In theory two methods are available:

¹ The meaning of ‘need’ is discussed below.

- a) to put goods and services up for sale or hire, and allocate them to buyers or hirers prepared to pay the most;
- b) to allocate resources to people who are considered to be in greatest need of them by a public authority.

The first method has the great advantage that it allows consumers freedom of choice. But it undoubtedly gives an advantage to the richer over the poorer, and cannot be considered satisfactory unless the distribution of income is fair.¹

The alternative method of allocation, by an administrative test of need, would not favour the rich over the poor but has its own difficulties and anomalies, as was seen in the 1940s when many goods were allocated by means of physical rationing. In practice it is workable only over a very limited field.

The subject of how to allocate resources is beyond the scope of this *Paper*. Suffice it to say that our society is organised on the principle that—broadly speaking—people earn as much as they can get, are taxed at a level determined by Parliament and are allowed to spend the balance—on average 60 per cent or less—in the way they think best. Where hardship occurs, it is to some extent relieved by public funds, again as decided by Parliament. This principle of allocating resources may not be the best, but it is used for most of the things we consume. The need for food, for fuel and for clothing—to take three examples of fairly ‘essential’ goods—is usually assessed by the amounts that consumers are prepared to pay for them out of their net income, i.e. after redistribution by taxes and subsidies.

This *Paper* is based on the assumption that parking needs should also be assessed by the amount that users are prepared to pay, and that

‘a permanent allocation of land to parking should be charged at least the economic rent for the use of the land, that is to say the value someone else would be ready to pay rather than be deprived of the use of the land. This is the cost to the community of the diversion of land to the purposes of parking. The principle applies equally to land used for the building of garages, for land set aside for parking by means of parking meters, or even for land permitted to be used for this purpose

¹ It is *injustice* in income distribution—and not *inequality* of incomes—that can provide an argument against the use of the price mechanism.

by that most arbitrary of planning authorities, the local police. In all these cases land is diverted from other uses, and should be charged for per square foot'.¹

Parking subsidies

It may be countered that some commodities are provided by public authority at less than cost, with the aid of subsidies, and that parking space should be included among them. Subsidies may be desirable where for example they transfer purchasing power or wealth from the strong to the weak, where the recipients are too young or too ignorant to help themselves, or (as in some medical services) where needs cannot generally be assessed by ability to pay.

But none of these considerations applies to parking. Generally speaking, people who own cars are better off than people who do not. If car owners are unwilling to pay parking charges in full, they are asking part or all of parking costs to be paid by non-car owners. The taxation of the poorer to help the richer is unacceptable on welfare grounds.

Moreover, a number of specific reasons associated with the effects on car users, public transport, people who provide car parks, and trade, make parking subsidies undesirable.

(i) Effects on car users

It is often taken for granted that cheap, subsidised parking space benefits vehicle users. This is not necessarily so. A cheap commodity loses much of its attraction if its supply is reduced so that it is not readily available. If parking spaces are so cheap that queues form for them, they will be used mainly by people who have time to queue. These people comprise only a section of car users, and not necessarily that with the most need. Nobody enjoys putting his money in a parking meter, but many would rather pay and park quickly than spend time in search of a free space. The salesman who earns his living in a congested city centre; the theatre-goer who wishes to arrive for the beginning of the performance; the shopper who wishes to make a quick purchase—all need to park urgently and are prepared to pay the cost. That parking space is provided at no charge through the

¹ D. L. Munby, 'The Roads as Economic Assets', *Bulletin of the Oxford University Institute of Statistics*, November 1960.

kindness of 'progressive' local authorities is no attraction if it cannot readily be obtained when required.

It is true that vehicle-users would benefit if parking space were both cheap and available. But space in cities is expensive, and it will tend to become more so as living standards rise. In no large city in the modern world—not even in the United States—can parking space be obtained both cheaply and quickly. In practice the choice is between paying and queuing. Many car users prefer paying to queuing, and it is therefore wrong to suppose that the interests of car users as a whole would be best met by forcing them to queue for free or cheap (subsidised) parking places.

(ii) Effects on public transport

In most cities public transport is losing ground to the private car, although it is more efficient in its use of road space, particularly in the rush hours. The reasons for the relative decline of public transport cannot be discussed here. Unlike the private car, the bus often provides the only possible form of mechanised transport for the very old, the very young, the not so well off, the sick—people who on welfare grounds might command a good case for a subsidy. Whether this subsidy should go to public transport or to the passenger, there is certainly no case for subsidising the private car, the main competitor of the bus.

Parking subsidies can have three adverse effects on public transport:

(a) They encourage long-term parkers, such as people who park while at work. On grounds of congestion it is undesirable to encourage them, for people who journey to work by car often contribute to peak flows, and they also have the alternative of using public transport for all or part of their journeys.

(b) Cars that park on the road without payment, or occupy it while their drivers search for cheap parking spaces, add to traffic congestion and thereby increase the costs of public transport while lowering the regularity of its service.

(c) Parking spaces at artificially low prices help to conceal from the motorist the true costs of his journeys, and increase resistance to paying economic bus fares. Even if a rise in the price at parking meters would not alter the number of meters in use, it would cause the public to see the level of bus fares in better perspective.

(iii) *Effects on commercial car parks*

The provision of subsidised parking space by local authorities is bound to discourage the provision of car parks by private enterprise. The commercial operator has to meet *all* his costs, including the rent of land, the return on risk capital and the remuneration of management. He cannot meet competition from a local authority that subsidises parking from the rates.

The mere fact that a local authority provides parking space at a relatively low charge will discourage private enterprise, even if there are many potential parkers who cannot be accommodated in the subsidised local authority car park. No supplier likes having to charge more for his product than the price charged for a similar commodity in close proximity. If the commercial operator charges more than the council, he is bound to incur the odium that the commercial operator 'takes advantage' while the gallant local authority 'does its best'. Commercial enterprise will not emerge spontaneously under these conditions. Furthermore, once the local authority provides *some* parking space below cost, it is liable to find itself having to provide *all* the parking space in its area—below cost.

(iv) *Effects on trade*

It is often argued that trade benefits from cheap parking space in shopping centres, and that if neither shoppers nor traders are prepared to pay the cost of parking space, it should be borne by 'the community' in order to safeguard the rateable value of the city centres.

The first comment to be made is that if trade is attracted from a village to a market town, or from one town to another, there is not necessarily an advantage to the community. The gain to trade in one place is offset by a loss in the other. From the point of view of the community as a whole any arrangement that artificially stimulates travel adds to real costs and is therefore wasteful.

It might be answered that even if from the point of view of the community at large there is no virtue in trade moving to a particular town, the movement would nevertheless be desirable for the town. A well-known firm of chartered surveyors has told me that all shopping centres can be regarded as being in competition with one another, and that the centres that did not

provide subsidised parking to attract customers would lose trade to the centres that did.

This may be true, and yet it is undesirable that local authorities should vie with one another to provide parking space for the benefit of their traders at the expense of their ratepayers. If people in a locality wish to assist local shops to stimulate trade, they are of course free to do so; but in my view it is wrong to force the whole body of ratepayers to give such support through the medium of the rate fund. A simple way of stopping this competition would be to make it illegal for local authorities to spend money on the provision of parking space, the only possible exceptions being expenditure on sign posting, and monies spent at the early stages of meter schemes. Local authorities are not (yet) allowed to provide subsidised beer halls, hairdressing salons, or cinema shows to attract trade to their localities; the same rules should apply to the provision of parking space for cars.

There is much to be said for the provision of car parks by the co-operation of local traders, who could share among themselves the costs and the profits, and it may be that local authorities could use their influence to get such schemes started. But subsidising local traders out of rate monies is a completely different story.

The irrelevance of motor taxation

The second hurdle is the widely held assumption that it is wrong to charge car users for parking because of the level of motor taxation. This viewpoint cannot be sustained.

There are two basic ways of looking at motor taxation. The first is that motor taxes do not differ in kind from other indirect taxes, that the proceeds of motor taxation should be used for the general purposes of the community, and that there is no necessary relationship between the costs of providing roads and the amounts raised by motor taxation. To those who hold this view there can be no connection between the level of motor taxes and the right to park in public places. That smokers pay heavy duty on tobacco does not give them the right to enter shops and remove ashtrays without paying for them.

Others (myself among them) hold that road taxation ought not to be a 'general revenue' tax but payment for the use of roads (on the lines of payment for gas, electricity or the telephone service), that payments should bear some relationship to costs, and that

surpluses should be invested in expanding the road system. Those who hold this view are apt to point out that the amounts paid by road users in tax exceed by many hundreds of millions the amounts spent on improving and maintaining the road system. Although it may very well be true that vehicle users as a class pay in vehicle taxation a sum that exceeds the costs of the roads to the community¹ (many of the calculations exclude important costs, such as the rental value of the land used for roads), the matter does not end there. It is important to consider not only what vehicle users pay *as a class* but what *individual* vehicle users pay for the costs they incur. If motor taxation is to be regarded as payment for roads, each individual should be expected to pay in road tax an amount roughly equivalent to the costs arising from his use of the road system. Parking space in cities uses resources that are particularly scarce and costly and, if road taxation were based on costs, would certainly be charged to the users.

Many of us might agree that a tax on petrol ought not to be used as a means of raising revenue for general purposes, and that it should be reduced. Our remedy is to make our case through our representatives in Parliament. But to claim that we are entitled to park in central London at no charge because of the level of petrol tax or purchase tax, is no more logical than to claim that cars should be supplied at less than cost by the manufacturers because the government uses the proceeds of motoring taxation for the benefit of non-motorists.

II. STREET PARKING

The basic point about the economics of street parking space is the high cost of increasing the supply. Street parking can cause crippling obstruction to moving traffic and is associated with a high proportion of road accidents in cities;² we may therefore expect the number of street parking spaces to decrease rather than to increase.

¹ Professor A. R. Prest calculated that in 1961 the cost of the road system in the UK was £470 million and the net receipts from road users £554 million. See 'Some Aspects of Road Finance in the UK', *Manchester School*, September 1963.

² On some roads in London the introduction of 'no waiting' restrictions between 1947 and 1949 led to an estimated reduction in accidents on the roads concerned of up to 30 per cent. F. Garwood and J. C. Tanner, 'Accident Studies before and after Road Changes', *Public Works Congress*, 1956, Paper No. 12.

Methods of allocating the available space

If in any area the number of people requiring to park on the street is larger than the number of spaces, some are bound to be disappointed. How are we to decide who should use the available space? In practice there are three methods:

- (a) 'first come, first served';
- (b) time limitation;
- (c) pricing.

(a) '*First come, first served*' is the method that asserts itself in the absence of parking restrictions. The available spaces go to those who get to them earliest. It gives an advantage to those who happen to travel into town early. It favours people who use their cars to travel early to work—and park it all day near their place of work. It discriminates against people who come in later during the course of the day—the later arrivals to work, shoppers, commercial travellers, and delivery vans.

(b) *Time limitation* is used to encourage a high turnover of cars in the parking spaces available. It is said to have two virtues:

(i) 'Fairness'. According to the Ministry of Transport: 'It is better—and in the general interest—for eight vehicles to be able to use a street parking space in a day, than for one to occupy it all day.'¹

(ii) It gives priority to the short-term parker over the long-term parker. This is said to be an advantage, as the short-term parker uses his vehicle for social and business purposes, which are considered to be more appropriate for the private car than is the main journey purpose of the long-term parker—the journey to work. The long-term parker is considered to be something of a nuisance because his trips are often made at the times of heavy peak-hour traffic.

(c) *Pricing* is the method of restriction adopted for the allocation of most goods and services in our society. High prices tend to restrain demand, and low prices tend to stimulate it. If the number of parking spaces in an area is fixed, a pattern of prices could be aimed at which would result in a small proportion of spaces in

¹ *Parking—the next stage*, HMSO, 1963.

every area being vacant at most times, so that parkers could find places with little difficulty.

The 'first come, first served' method is obviously of little value in allocating parking space to people in most need. It has no defenders and there is no point in discussing it further. But what are the relative merits of time limitation and pricing?

The proposition said by the Ministry of Transport to be self-evident, is not so at all. Why should it be more in the general interest for eight vehicles to use a street parking space in one day than for one to occupy it for eight hours? Do we say that it is more in the general interest for seven people to be able to stay at a hotel for one night each than for one to stay a whole week? If somebody wants to buy four pounds of sugar, do we say that it is better that he should buy four separate pounds in four separate shops rather than four pounds in one? If I decide to buy a suit, is it 'fairer' that I buy the jacket from one tailor, the trousers from a second and the waistcoat from a third?

The argument that time limitation is a good method because it discriminates against the motorist who uses his car for the journey to work and leaves spaces for people who use cars for other reasons, contains two separate elements. First, it is said that the long-term parker tends to use roads at peak times and should be discouraged to ease congestion on the roads. This is not always true; many people who park while at work arrive either before or after the peak. Secondly it is said that the long-term parker is less deserving of parking space than the short-term parker: that short-term parkers include shoppers, and that parking schemes should encourage shoppers. But if traders wish to encourage short-term parking, there is nothing to stop them building car parks in town centres and making them available for short-term parkers.¹ It is certainly not in the 'general interest' that people should be encouraged by subsidised parking spaces to shop in some centres or towns rather than others.

Thus provided that motorists who park for long periods are made to pay accordingly, it is difficult to see good reasons for restricting car parkers by time limits.

On the other hand, there is a good reason for discouraging this method: motorists who do not find a parking place under a

¹ The town planning authorities are usually anxious to encourage the provision of off-street car parks in town centres.

system of time limitation tend to add to congestion by cruising in the area looking for a vacant parking space. This practice, which has been described as 'mobile parking', adds considerably to street congestion. In one American survey 34 per cent of vehicles were classified as 'mobile parked', and others revealed that 7 to 10 per cent of moving vehicles were looking for a parking space or waiting to pick up passengers.¹

Where parking limitation is by price, mobile parking would appear only if the price were too low. Otherwise, people prepared to pay the price would enter the area and find their places quickly, while others would keep their cars out and not add to congestion on the streets.

These considerations put out of court all systems of parking control that consist only of time limitation. One such system is the French 'disque' system, whereby car parkers indicate the time of arrival at a parking place by means of clock-like discs on their windscreens. Another system of 'pure' time limitation is the one developed in Leicester, where wardens armed with watches ration the available parking time among competing motorists. The real objection to these methods is that they fail to allocate space to motorists in most need. They do not allow those whose requirements are more urgent to obtain preference. Pricing methods, on the other hand, enable some users to outbid others for parking space and, in so far as willingness to pay indicates need, give preference to those with most need.

Parking prices

If street parking space is to be allocated by price, what price should be charged? And how should payment be collected?

In theory the ideal price is that which would result in a few spaces being available in all areas at all times so that parkers prepared to pay the price can be assured of finding a convenient place reasonably quickly.² If the price is pitched so high that there

¹ R. G. Knight, *The Parking Problem. A Digest of the Literature*, Library Communication No. 154/RGK, Road Research Laboratory, April 1950.

² 'A price which clears the market sorts out those who really want to use the asset most (given the normal assumptions about a fair distribution of income). It can also be regarded as the marginal cost price.' D. L. Munby, *op. cit.* If A and B wish to park in the same place, the cost of A using the space is the loss of benefit to B, which is the marginal cost price. This is the amount that A has to pay in order to outbid all other Bs.

are always large numbers of parking spaces vacant, a waste of resources would result. If the price was so low that there were many people looking for spaces for long periods, the price would fail in its purpose of allocating spaces quickly to motorists prepared to pay for them.

What proportion of spaces should be left vacant? The Ministry of Transport has suggested in *Parking—the Next Stage* that an average occupancy of 85 per cent was the one to aim at. This figure is also aimed at by some commercial organisations.

But in practice, as demand fluctuates from time to time and from place to place, it will not be possible to find prices which would bring about a utilisation of 85 per cent (or any other figure) at all times and in all places. Parking requirements change from one hour of the day to another, from one day of the week to another and from one season of the year to another. Requirements also vary very widely from one place to another, even within a very small area. For example, investigations carried out in 1961 by the School of Work Study revealed that in the Bond Street area of central London the odds of finding a vacant meter space could be as low as one in 300. On the other hand, in some side streets, even in Mayfair, space was often available for long periods.

Clearly, the important requirement for a meter pricing system is that it should be as flexible as possible. Schedules of charges must be simple, but this does not prevent variations between streets, times of the day, or parking periods.

Until recently, meter prices in Britain were anything but flexible, the usual charge being 6d. an hour or *pro rata*. Only Newcastle-on-Tyne and Cambridge had differential charges: 6d. for half-an-hour, an hour and two hours in three price zones in Newcastle, 6d. for half-an-hour and an hour in two zones in Cambridge. In London the standard 6d. an hour has just been raised to 6d. for half-an-hour in some areas and to 6d. for a quarter of an hour in others. These changes were long overdue, and it is to be hoped that they will set a pattern for more price flexibility throughout the country. In Melbourne, Australia, meter charges in the last few years have been 'tapered' from 6d. for 20 minutes in the city centre to 3s. a day at the outskirts.

Changing the price in accordance with the time of the day, though desirable, has not yet been tried because it would cause

meters to become more complicated. Ideally, the charge for parking should be highest between 11 a.m. and 3 p.m., and lowest early and late in the day when demand is comparatively slack. In many shopping areas demand for space is very high on Saturdays, and extra high rates would be desirable. A high 'Christmas rate' in December might be necessary in some shopping areas. These variations would shift some of the demand to periods in which parking charges were lower, and thus help to achieve the highest utilisation of the available parking space.

The waste of parking space resulting from the imposition of uniform charges over large areas is illustrated by the figures in Table I. They show the average utilisation of metered spaces in different parts of London when parking charges were fixed at 6d. an hour throughout the area.

TABLE I
PARKING METER UTILISATION IN LONDON

Area	Average meter utilisation per cent
City of London	96
Westminster	90
St. Marylebone	83
Shoreditch	83
Holborn	81
St. Pancras	71
Paddington	38
Finsbury	21

Source: J. T. Duff, *Traffic Management in Towns*, World Touring and Automobile Association, 1964.

In the flexibility of pricing systems, two characteristics are desirable. First, it should be accepted that parking prices are provisional. Local authorities should have the power to alter prices at short notice in order to meet fluctuations in demand. It is now not possible for this to be done without the cumbersome procedure of approval by the Minister of Transport. Secondly, parkers should be enabled to buy parking time in small amounts. If it is decided to charge at the basic rate of, say, 1s. an hour, it is better that the parker be given the option of paying 6d. for half

an hour or two 6ds. for one hour. It would be better still if he were given the option of paying 3d. for a quarter of an hour, or two 3d. bits for half an hour, and so on without limit. So long as the charge is exactly 1s. for one hour, people who need to park for only half an hour are nevertheless made to pay for a whole hour and are therefore encouraged to dally and so waste space. There may also be people prepared to pay 6d. for half an hour *but not 1s. for a whole hour*, when the space is required by them for only half an hour. They would be deprived of the chance to park if they were not given the option of buying only half an hour's parking time. There is much to be said for keeping the unit of charge low, even if it does entail more work for supervisory staff, and (if 3d. bits are used) a more frequent emptying of meters.

Parking meters

So much for the theoretical advantages of allocating street parking space by price. How is it to be collected?

The chosen instrument of the Ministry of Transport since 1958 has been the parking meter. In that year 647 meters were introduced experimentally in central London. They 'sold' parking space at 6d. for one hour or 1s. for two hours, and a further two hours at the 'deterrent' price of 10s. Staying at a meter for over four hours was illegal, and punishable by a £2 fine.

Since 1958 meters have spread rapidly in Britain. Most of them have followed the original pattern set in London, but some sell four hours' space for 2s. and some five hours' for 2s. 6d. Some sell only half an hour's space for 6d., and some two hours' for 6d. The spread of parking meters in Britain is shown in Table II.

TABLE II
THE SPREAD OF PARKING METERS
IN BRITAIN

	1961	1962	1963	1964	1965 ¹
Central London	5,397	10,555	12,492	13,845	13,901
Outer London	—	1,558	2,135	2,095	2,135
Provincial cities	500	1,250	4,630	8,710	13,645
Total	5,897	13,363	19,257	24,650	29,681

Source: J. T. Duff, *op. cit.*, and Ministry of Transport Press Office.

¹ At 1 April in each year except 1965, 15 June.

TABLE III
PARKING METER REVENUES IN GREATER
LONDON

(Average annual takings to 31 March, 1963)

Area	Income per meter per year £
Westminster	70
St. Marylebone	55
Holborn	50
City of London	49
Kingston	49
St. Pancras	46
Shoreditch	37
Paddington	29
Finsbury	29
Croydon	29
Woolwich	25
Mean	55

Source: J. T. Duff, *op. cit.*

Parking meter costs

The costs of providing and maintaining parking meters are subject to considerable variation. An example of what the costs can be was given by the late City Engineer of Westminster who calculated¹ that the total cost of providing and installing the first 1,822 meters in Mayfair was £69,000, which worked out at about £38 per meter. This figure included the cost of all necessary signs and road markings and also £5,000 for preparing and making the Orders, including the expense of public enquiries.

Mr. Hogg estimated that the annual costs were £84,000, or £46 per meter per year. This estimate provided for amortising the initial costs over a period of 10 years, full maintenance of meters, road markings, etc., and all salaries and expenses of the staff employed. However, it did not include all the costs of enforcing the meter scheme.

Parking meter revenues

The revenues from parking meters also vary widely. Some of the figures collected by Mr. Duff are shown in Table III.

¹ A. W. Hogg, 'Control of Street Parking', Institution of Municipal Engineers' Convention on 'The Problem of Car Parking', 1960.

TABLE IV
BREAKDOWN OF METER INCOME AND
EXPENDITURE

<i>Income</i>		<i>Expenditure¹</i>	
	<i>per cent</i>		<i>per cent</i>
Meter fees	78	Wardens (or attendants)	54
Excess charges	22	Maintenance	27
		Loan charges	11
		Other expenditure	8
Total	100	Total	100

Source: J. T. Duff, *op. cit.*

¹ The expenditure figures cannot include all the enforcement costs, some of which are not borne directly by the boroughs concerned. Enforcement of parking regulations has to be paid for even where there are no meters.

Mr. Duff gives the breakdown shown in Table IV of income and expenditure relating to meters in five London boroughs.

Shortcomings of conventional meter schemes

Parking meters are often criticised on the following grounds:

- (a) the income is comparatively low;
- (b) the systems are cumbersome to enforce;
- (c) the meters are unsightly and take up space on pavements;
- (d) the division of parking areas into meter bays wastes road space as all bays have got to be large enough to accommodate the biggest cars.

The difficulties are largely self-inflicted. They are not inherent in allocating road space by price and they could be avoided by measures such as the following.

Increasing meter revenues

While in areas where parking demand is low, meter revenues can only be low, revenues could be increased in areas of high demand by the simple expedient of raising charges. As was shown earlier in this section, economic meter charges would increase the usefulness of parking meters. There is no logical case for pro-

viding parking space in towns other than at market charges designed to balance supply and demand.

Enforcement difficulties

Why has it proved difficult to enforce parking meter regulations? Which vehicles are parked without paying the meter fee can be seen by a glance at the meter. The name of the owner of the vehicle can be traced through the registration number of the car. The difficulties that have been encountered are:

- (a) Tracing the *vehicle owner*; it has proved troublesome and time-consuming to obtain from him the name of the *driver*. This difficulty persists although in most cases the owner and driver are usually the same person.
- (b) Stopping the habit of 'meter feeding'—inserting successive coins to buy more time than allowed by the meter regulations.
- (c) Dealing with vehicles waiting to unload goods—or purporting to be waiting—outside the meter bays.

All these difficulties arise from trying to enforce not the *pricing* function of meters, but their *rationing* function. The problem of finding the name of the driver of the vehicle could be solved simply by making no attempt to find it, and making the vehicle owner responsible for the payment of parking dues. This solution—common in the USA—has been advocated by responsible opinion within the police force, but so far to no avail. Vehicle owners could, if they wanted to, recover any parking dues from the drivers.

The problem of 'meter feeding' could be solved by making it legal. As long as the price charged is high enough to ensure that there are always vacant spaces at meters, there is no reason to deny people the right to pay for extra time if they require it. All the paraphernalia of 'excess charges' and other complicated devices could then be swept away. Motorists who over-stay their time should be charged for the time their cars are parked, plus a 'collection charge' of one pound or so to cover the cost of invoicing, etc. The collection charge could be reduced on outstanding debts being paid promptly, and possibly reduced still further if payment were made on the spot. There would be no

need to chase up vehicle owners who do not pay. All the authorities would need to do is wait until the owners come to renew their car licences. The vast majority of defaulters could then be made to pay as a condition for getting their licences renewed.¹ In addition to the parking dues and collection charges they could also be charged interest on outstanding accounts.

The difficulty of vehicles unloading in meter areas could be mitigated by metering the whole area, including loading bays, but giving owners of premises the right to 'hood' the meters outside their premises when the space is required for unloading.²

Other methods of charging

The disadvantages arising from the unsightliness and 'clutter' of parking meters and the necessity of providing meter bays large enough to accommodate big cars could be overcome by using different kinds of meter. Three new types of meter have been suggested:

- (a) Ticket-issuing machines;
- (b) 'Personal' parking meters to be carried in cars;
- (c) A road pricing meter to charge for parking time.

(a) The ticket-issuing parking meter

This coin-operated machine (one type is manufactured by Universal Parking Meter Ltd. of Orpington, Kent) issues a time-stamped ticket which can be affixed by the motorist inside his windscreen when he parks his car. The time stamped on the ticket indicates whether parking time has been paid for. One ticket issuing-machine can cover a section of a street or a square and the need for separate meters is obviated. There is also no necessity to mark out separate bays. These machines are used successfully in Newcastle, Colchester, Maidenhead, Sevenoaks and other places. The main difficulty is that the motorist may have to walk a short distance from his parking place to the ticket machine in order to obtain the ticket, although they can be sited at the entrance or exits of car parks or parking spaces.

¹ The collection of gas, electricity and telephone bills is enforced by the threat of interruption to the supply, rather than by the ultimate sanction of legal proceedings.

² See Section IV, pp. 41-43.

In addition to doing away with the unsightliness of parking meters and the necessity of providing fixed meter bays, ticket-issuing machines have other advantages over conventional parking meters.

(i) As one ticket-issuing meter can replace a large number of conventional meters (say 10 to 30), there can be considerable savings in capital, installation, and maintenance costs.

(ii) Ticket-issuing machines can be made large enough to incorporate change-giving units, or to accept a wider variety of coins than can a conventional parking meter. They can also incorporate thermostatically-controlled heating elements to guard against freezing.

(iii) Although the ticket-issuing machine is set to give a given parking time for a given coin, multiples of this can be sold by permitting the user to buy a number of tickets simultaneously, and to reveal them together in the windscreen of his car. Thus if a single ticket time-stamped '9.00 a.m.' were to allow parking until 10.00 a.m., a strip of four tickets joined together stamped '9.00 a.m.' could allow parking until 1.00 p.m.

(iv) The tickets can be numbered and so provide a ready means of checking the cash in the machine and keeping records of meter utilisation. Conventional meters provide no record of cash takings.

(b) 'Personal' parking meters

A 'personal parking meter' can be considered as a mechanised parking 'disque'. It could consist of a clock that could be started or stopped at will and that has to be wound up to give a fixed number of parking hours. It would be attached to the inside of the car windscreen, and when the driver wishes to park in a metered parking area all he would have to do would be to set his clock going. In this way he would run down his meter and eventually he would have to have it re-wound. This would involve paying the parking fee. The meters could be re-wound at post offices or at special meter-winding depots. It is possible to envisage a meter which has two or more running speeds, and parkers could set the meter to run down quickly in some circumstances and slowly in others.

TABLE V
PARKING METERS IN LONDON: INCOME, EXPENDITURE AND SURPLUSES USED FOR
OFF-STREET CAR PARKS

Area	Total income to 31.3.64	Total expenditure to 31.3.64	Surplus (+) or deficit (—)	Amount of surplus used for off-street parking.	Purpose
£	£	£	£	£	
Croydon	90,762	78,029	+12,733	10,066	To reduce revenue deficits.
Finbury	44,954	62,790	—17,836	—	To defray the cost of land purchased by the Council for a car park to be built by private developers.
Holborn	286,634	183,436	+103,198	33,845	—
Kingston	41,680	36,987	+4,693	—	To reduce revenue deficits.
City of London	117,999	107,884	+10,115	10,115	—
Paddington	27,236	29,638	—2,402	—	To meet preliminary expenses and land costs for new car parks.
St. Marylebone	539,983	379,924	+160,059	14,629	—
St. Pancras	102,639	84,625	+18,014	—	—
Shoreditch	39,738	38,075	+1,663	—	—
City of Westminster	967,096	668,184	+298,912	137,218	To make good revenue deficits on completed schemes and to meet preliminary expenses on uncompleted ones.
Woolwich	28,167	36,905	—8,738	—	—

Source: Ministry of Transport press release, 8 March, 1965.

(c) *A road-pricing meter used as a personal parking meter*

This method would be the most satisfactory of all. If cars were to carry meters to charge the owners for driving in towns, it should be possible to arrange for the meters to be available for parking. They could have a special 'parking rate' at which they would have to be set when parked at authorised parking places. The main enforcement problem here would be to make sure that they were switched on. Payment for parking would then be combined with payment for the use of road space for moving. The principles and methods of road pricing have been discussed recently in a number of publications and some information on this subject is given in Appendix 3.

The disposal of meter profits

According to figures published by the Ministry of Transport, the income and expenditure on parking meters in the Greater London area up to 31 March, 1964 was as shown in Table V.

The total net revenues since meters were first installed to 31 March, 1964 was £609,000, representing about 1½d. out of every sixpence put into a parking meter.

The potential net revenues from meters are obviously much more than 25 per cent of the takings. If the authorities regarded meters as space salesmen attracting revenue by selling parking space to the highest bidder rather than as rationing devices, they could gain in two ways: they could increase gross revenues by raising meter prices; they could simplify supervision and reduce enforcement costs by abolishing time limits and excess charges.

How should the profits from meters be spent? The Road Traffic Act of 1956 established the principle that profits must be used for meeting all or part of the cost of providing and maintaining off-street parking accommodation. Strictly speaking, this principle does not necessarily imply a subsidy, as there is nothing in the Act to prevent a local authority from recovering the full costs of the car parks from the users and so also the parking meter revenues spent on providing the off-street car parks. But a subsidy was certainly intended by Parliament, and the Act is interpreted in this sense by local authorities, motoring organisations and others.

The principle of forcing short-term parkers to subsidise long-term ones is difficult to justify on rational grounds. It certainly makes no economic sense. The rent obtainable from street parkers should properly be regarded as due to the owners of the road space—the local ratepayers.¹ It should be used by the local authority for its general purposes. This form of subsidy is not generally likely to improve traffic conditions. It is not desirable to encourage car owners to travel to a town and park there all day. It would be more sensible to provide parking spaces *outside* the central area than within it, particularly at railway stations and at bus termini.

The idea that a local authority should charge an economic rent for the use of street parking space might be novel, but the principle is well established in other spheres. When local authorities lease or sell property, it is taken for granted that they strike the best possible bargain in the interests of their electors and ratepayers.² If, by virtue of their control of road space, local authorities are enabled to earn a rent from its users, it is in the interest of the community that they should collect it and use the revenue to offset the costs of community services.

How many spaces to provide?

So much for the short-term problem of allocating existing street parking-spaces among competing users. We must now consider the long-term problem of how many street parking-spaces to provide.

It was suggested in Section I that the criterion to use here is that space should be allocated to car parking only if the needs of car parkers are more urgent than those of people who wish to use the space for other purposes, and that 'need' should be assessed by willingness and ability to pay. Two main alternative uses must be considered:

- (a) the narrowing of the road and the use of the space for buildings or other non-transport uses;
- (b) the use of the road space by moving vehicles.

¹ Technically, the owners of the road space might be private estates or individuals. But when a road is dedicated to public use, private owners lose both the obligation to maintain it and the right to use it for their own purposes. The private ownership of public roads is thus of little practical importance.

² When the London County Council developed Kingsway, and found itself owning the properties on both sides of the street, it let them at their market values, and has continued to do so even under a Labour administration.

A conflict between the demands of car parkers and site developers for the use of space can in principle be resolved by allocating the space to the highest bidder. There would of course be practical difficulties, one of which is that the rent that people pay for a building will be influenced by the amount of parking space in its vicinity. Furthermore, buildings are usually built or demolished in large units, and it is rarely practicable to convert part of a street to a building site or *vice-versa*. But when complete redevelopment takes place it is often necessary to decide where to draw the line between parking and non-parking uses; if parking space were properly charged for, the rents could be used as a guide to the number of spaces to provide.

It will be seen later (Appendix 1) that street parking is very costly. Where land is scarce, the application of these principles is likely to result in street parking-space being displaced in favour of multi-storey parking.

More difficult in principle is the question of the extent to which road space should be used for parked cars rather than for moving traffic. The difficulty is that while there is a market for building land—imperfect, but still a market—there is no market for the use of road space. Road users are required to pay taxes for road use, but not specifically the costs that arise from their use of scarce road space.

One of the most important of these costs can be described as 'congestion costs', created by vehicles that delay one another in traffic congestion. The effect of one vehicle delaying the traffic can be calculated from a knowledge of the speed-flow characteristics of the road network. The cost of delay includes higher labour costs, loss of people's time, higher fuel and running costs, and lower utilisation of vehicles and their loads. These costs have been measured in some detail by the Road Research Laboratory,¹ and estimates for central London show that when the traffic is slowed down by congestion, the costs imposed by a typical car on other vehicles rise from 4d. a mile at traffic speeds of 20 m.p.h. to 2s. 2d. a mile at 12 m.p.h. and 3s. 5d. a mile at 10 m.p.h. These costs of 4d. to 3s. 5d. a mile are far in excess of the 1d. to 2d. a mile paid in petrol tax by most private cars.

¹ *Road Pricing: The Economic and Technical Possibilities*, HMSO, 1964; see Appendix 2.

To make the best use of the road system it is necessary to exclude from it those whose benefits from using the road fall short of the costs imposed by them on others. The obvious way of doing this is by the price mechanism, i.e. by making the road users pay the costs imposed by them on others.¹ However, until (by a pricing mechanism or otherwise) we exclude these road users, it is not possible to allocate rationally road space between parked cars and moving cars. This may be illustrated by the following example.

Consider a street narrowed by a lane of parked cars. The cars will impose delays, and therefore costs, on the moving traffic. The costs to moving traffic might be, say, £1 an hour. If there are 10 cars in the lane it could be argued that each should pay at least 2s. an hour for the privilege of slowing down the moving traffic. It would follow from this that if the 10 spaces were fully used at 3s. an hour, so that the parked cars were paying more than the costs they imposed on the moving traffic, there would be a case for increasing the number of parking spaces and reducing the street capacity still further. If, at the optimum utilisation of the 10 spaces, the parked cars were paying only 1s. an hour, there would be a case for allocating more of the street space for moving cars.

But this argument cannot be sustained if the moving cars do not pay the costs imposed by them on the rest of the traffic. For if some of the owners of the moving cars were asked to do so, they might prefer to avoid the street. In that case congestion would fall, the parked cars would not impose costs of £1 an hour on the moving ones, and there would be no case for requiring them to justify their use of the road space by paying 2s. an hour each.

If both moving and parking vehicles paid the short-term costs arising out of their use of the road (that is, if each moving vehicle paid the costs imposed by it on other moving vehicles, and each parked car paid an amount equal to the costs imposed by it on the unsuccessful would-be parker²), the allocation rule would be that the number of street parking spaces should be increased to the point at which parking charges paid by street parkers just

equalled the congestion charges paid by moving traffic. Parking charges less than the congestion charges would indicate that congestion was excessive and that there was a case for increasing the space available to moving cars; parking charges higher than congestion charges would indicate that the parkers were out-bidding the moving traffic for space, and that there was a case for increasing the number of parking spaces at the expense of the space available for movement.

Until all cars are charged for the use of the road, there is no rational way of allocating road space between parked cars and moving ones. All one can do is to warn against the prevalent attitude that moving traffic should always be given priority over stationary traffic because 'streets are made for movement and not for parking'. The object of city streets is to provide facilities for access, which requires parking as well as movement. Street parking should be forbidden where it causes 'exceptional' danger and interference with movement, but there are many streets in which the benefits to car parkers outweigh any conceivable losses to moving traffic, even under the present system of charging.

III. OFF-STREET PARKING

In order to apply our basic principles (page 10) to the provision of off-street parking facilities we should first adjust the charges for existing parking spaces (both on-street and off-street) so as to obtain the highest possible utilisation consistent with some spaces always being available. If these charges are high enough to cover the costs of further parking spaces, the number of parking spaces in the area should be increased accordingly, and the revenues from the new car parks used to cover their costs.

On the other hand, if the charges currently obtainable for parking space are not high enough to cover the costs of further spaces, no more should be provided.

'There is no economic shortage of parking space until the rent of land in use for parking exceeds the rent of similarly situated land used for other purposes'.¹

¹ D. W. Glassborow, 'Parking Charges and Parking Meters', *Westminster Bank Review*, November 1961.

¹ The appropriate price to charge would be equal to the costs imposed by vehicles upon one another under the conditions prevailing *after* the introduction of a price mechanism. For a private car this might be 8d. to 1s. a mile where present traffic speeds are 10 miles an hour.

² I.e., a price that 'clears the market' and results in maximum utilisation of parking space. See footnote 2 on page 19.

In practice, this procedure for dealing with the parking problem in any area would necessitate the following stages:

1. Introduce a pricing system for street parking using either parking meters, ticket-issuing machines or road-pricing meters.
2. Evaluate the costs of providing off-street car parks in different parts of the area.
3. Evaluate the economic demand for parking space in different parts of the area.
4. Construct car parks where the demand for space appears to be high enough to cover the costs, having regard to the effect of the car parks on amenity, traffic flows and other relevant considerations.

The problems of estimating the costs of parking space and the demand for parking space are technical and are discussed in Appendices 1 and 2 respectively.

Appendix 1 shows that the costs of providing off-street parking spaces can usually be met by charges of 9d. to 1s. 6d. an hour. Appendix 2 suggests that there is a considerable demand for parking space at charges of up to 1s. an hour, and that many car users are likely to pay even higher rates for convenient parking space. There is therefore no unbridgeable gap between the charges necessary to cover costs and charges that motorists are prepared to pay.

Possible suppliers

But who will provide the car parks? There are three possibilities:

- (i) Private enterprise.
- (ii) Local authorities.
- (iii) The central government.

Private enterprise

We rely on private enterprise to supply us with most of the commodities for which there is a demand at prices that cover costs: motor cars, petrol, housing space, storage space, and so on. In a rational world we would expect private enterprise to step in and provide parking space when it becomes profitable to do so. Unfortunately, in many cities parking space is not provided by private enterprise, even when charges could cover costs. Why?

The main reason is probably that at the moment the climate of opinion is hostile to the payment of free-market parking charges. A man who does not hesitate to pay 6d. for a 5-minute telephone

call may go to a lot of trouble to avoid paying 6d. for an hour's parking. A woman who regularly tips her hairdresser 10s. has been heard to complain bitterly at being asked to pay 5s. to park all day at the store in which the hairdressing *salon* is situated. There is undoubtedly a widespread feeling among drivers that their contribution to the Exchequer by way of motoring taxes entitles them to park at the public expense. This viewpoint may be understandable, but as long as it is widely held commercial interests cannot be expected to invest in car parks on a large scale. Let any person who doubts this conclusion ask himself whether he would invest his money—or advise his widowed aunt to invest hers—in an off-street car park.

This attitude can only be overcome by education. It is necessary to show motorists that whatever view is held about motor taxation, whether it should be regarded as a tax pure and simple or as a price for the use of roads, there can never be any justification for high-cost parking space being provided otherwise than against payment that covers its cost. But the intellectual argument will not be sufficient; the important point to put over to the vehicle user is that although it is for him always better to park free than to park and pay, it is often better to park and pay than not to park at all. When meters started in London there was a reluctance to pay for them; this is perhaps understandable, in the sense that few people like paying for anything. But once motorists got used to paying for parking at meters they appreciated the convenience of being able to obtain parking space when they required it. Alas! they did not enjoy this luxury for long. In many places the demand for space at 6d. an hour was so pressing that queues formed once again.¹

Another impediment to the supply of parking space by private enterprise is the existence of low-cost alternatives. Free street parking has already been discussed: no rational person will pay for a car park when equally convenient space is available on the street at no charge. The provision of parking space at subsidised rates by local authorities is another low-cost alternative. So is the space provided by developers to satisfy the requirements of planning authorities. (Both are discussed below.)

¹ Since meter prices were raised to 6d. for 15 minutes, spaces in Mayfair have once more become available. Time will show whether the new price is anywhere near the equilibrium level.

These factors may help to explain the reluctance of private enterprise to invest money and effort in the provision of car parks. And they reflect credit on the handful of firms which are pioneering commercial parking under the present unfavourable circumstances.

Local authorities

It was the Public Health Act, 1925 (Section 68) which first gave local authorities in England and Wales, the powers to provide parking places, and for that purpose to acquire land and appoint staff to control car parking. Although the Act enabled local authorities to charge for the use of the parking places, there was no obligation to ensure that the charges collected were high enough to cover the costs. Local authorities may therefore spend large amounts from rate funds on parking space without any regard whatsoever to the income obtainable from them. As a result, many councils make land available for parking free or at nominal rents. In the New Towns it is taken for granted that free off-street car parks should be made available to all-comers. The City of Cambridge has for years used one of the most expensive sites in its centre for car parking at a charge of a 1s. for a morning or for an afternoon. At this price the 'Car Park Full' sign is put up every Saturday and on most other days. Similar examples can be quoted from all over the country.

If a local authority were to run a hotel at nominal charges and long queues of would-be guests formed every night, the ratepayers would rise as one man and elect a new council. Yet when car parks are run in this manner there is little or no opposition.

Readers who accept the argument advanced so far will agree that it is generally undesirable for local authorities to provide parking space at charges that do not cover costs. There is however the possibility of local authorities providing parking space commercially, that is, at charges that do cover costs. Are they suitable organisations for providing parking space on this principle?

While in some cases the public enterprise of local authorities can be beneficial, it can also lead to difficulties. In the first place there is the financial risk; few things are easier than to lose money on commercial enterprises. If an individual or a group of individuals organised as a company loses its money, that is a

private matter: no-one else suffers. But when an enterprise run by elected councillors loses money the loss is likely to fall on the ratepayers and the community at large.

It is sometimes said that local authorities can run parks at lower cost than private enterprise because they can raise money more cheaply and often own suitable sites. But both these examples are not examples of genuine cost reductions; they are examples of some of the costs being passed to ratepayers. In so far as the provision of a car park involves risk, it is necessary to raise risk capital and to pay for it accordingly. If a local authority uses its rate funds to guarantee the commercial success of a car park it is in fact giving it a subsidy equal to the cost of obtaining such a guarantee commercially. Nor can a local authority reduce costs by virtue of its ownership of the land on which the car park is built. The car park should be debited with the rental value of the land, which is the same whether under private or under public ownership.

On the other hand there are reasons that would make one expect a local authority to be less successful than a private firm in running a car park, or even in choosing its location. The commercial firm is—or should be—geared to the search for enterprises that yield profit. The local authority is not. A commercial firm can be much more flexible than a local authority; it can offer special terms to attract business and to retain key members of staff. A local authority cannot differentiate between customers and must pay equal rates to all employees. Local authorities are not organised to run commercial operations and it is no reflection on elected members or their staffs to say that they are often unable to provide commercial services as cheaply as private firms. Indeed many local authorities recognise this and contract the operation of their car parks to private firms.

Other problems may arise when local authorities go into the car parking business. The positioning of a public car park can have important effects on the fortunes of individual shops or on the amenity of workers in factories, and it is undesirable that decisions on these matters should be taken by councillors who would not be able to move without being accused of political partiality. There is a further reason which makes local authorities unsuitable for the promotion of commercial car parks; they are unlikely to command the necessary expertise.

A 'National Parking Authority'

As an alternative to local car park authorities, it is possible to envisage a 'National Parking Authority' as a governmental body employing expert staff and empowered to construct and operate car parks on a commercial basis wherever it sees fit. Its aims would be to make its car parks individually self-supporting, though it would be allowed to operate at a loss in the early stages. As a national authority could employ expert staff and would not be deeply involved in local affairs, it might have advantages over local authorities. On the other hand, if it were to act on purely commercial grounds it is difficult to see what advantage it would have over a private enterprise firm.

Conclusions

There are a number of obstacles to the participation of private enterprise in the provision of car parks on a large scale. The first step should be to remove these obstacles and to make it profitable for off-street car parks to be provided commercially. If, after the removal of the obstacles, including parking subsidies, town planning requirements, etc., the shortage of parking space remains, public enterprise should fill the gap where there is a demand for parking space at charges high enough to cover costs. But car parks provided by public enterprise should charge prices that cover *all* costs. The provision of car parks at the expense of ratepayers or taxpayers discriminates arbitrarily between different sections of the public and is bound to discourage the provision of car parks that cover their costs.

Planning requirements

Many local authorities insist on the provision of car parking spaces in new developments as a condition of planning consent. These requirements ('planning standards') vary from authority to authority. For example, the standards for offices range from one car space for every 2,500 sq. ft. (the London County Council standard now used by many authorities in the Greater London area) to one car space for every 350 sq. ft. (Kent County Council).

Insistence on the provision of parking space where there is no possibility of recovering the costs by parking charges results in a subsidy to car parkers. For example, in order to obtain parking space to serve the City of London, the Corporation demanded that certain tenders for building leases should allow for minimum

numbers of parking spaces. The requirements undoubtedly reduced the prices that developers were prepared to pay for their leases, and in that way the City ratepayers were forced to subsidise parking in their area. Generally speaking, where a developer is forced to provide parking space which he does not consider to be economically desirable, there is a subsidy to the user of the parking space at the expense of those who make the land available to the developer—in this case the City of London, or rather its ratepayers.

In New York the planning authorities do not require developers to include parking space in office buildings in the city centre; it is felt that such provision would unnecessarily attract cars into the central area.

Planning authorities in Britain usually insist, moreover, that the parking spaces be used only by the occupiers of the buildings concerned, unless specific planning consent is made to the contrary. Thus in London the following condition is normally imposed:

'The whole of the car parking accommodation shall be provided and retained permanently for the accommodation of vehicles of the occupiers and users of the remainder of the building.'

This can lead to absurd results. For example, the developer of a prominent office building in Westminster had to provide 60 parking spaces. He wished to let them to occupiers of other buildings in the neighbourhood and in order to do so, and to test the market, he advertised them at a price of £135 per year. Many applications were received, and the developer sought permission from the LCC to let the space accordingly. The LCC refused, although the occupiers of the building did not take up more than half of the spaces at the price advertised. The developer appealed to the Minister of Housing and Local Government, who upheld the LCC. The result is that (at the time of writing) half of the spaces in the building are still unused, as the occupiers of the building do not wish to use them at the price offered and those who wish to use them are forbidden to do so by the planning regulations.

The refusal of the authorities to allow parking space to be used by the highest bidders has very important implications. In the

first place it shows how planning powers can be used to enforce an inefficient use of parking space—inefficient in the sense that motorists prepared to pay the higher charges may be assumed to have more need. Second, decisions of this kind tend to depress the price of parking space, and therefore discourage its provision.

As an alternative to parking standards, several local authorities have arranged for developers to make a financial contribution towards the cost of providing parking space *outside* their buildings. These arrangements, in some ways an improvement on the normal requirements, clearly illustrate the subsidies inherent in the planning standards. The latest official publication, *Parking in Town Centres*,¹ comments:

‘this solution will often be to the advantage both of the developer and of the public. The developer will be absolved from the need to devote valuable space within his building or its curtilage to the *unremunerative function of car parking*; the public will get a car park which is open at all hours and available for their use. Where, therefore, the planning authority would normally require by condition that development should include provision for the parking of cars it may be that the developer would prefer to make a contribution towards the cost of car parking facilities provided by the authority.’ (My italics) ‘The Minister of Housing and Local Government and the Secretary of State for Scotland welcome arrangements of this kind and invite local authorities to consider whether more frequent use of them may not be possible.’²

The authors do not appear to appreciate that contributions by developers in lieu of parking space are a subsidy to car parking. At any rate, their support of parking subsidies does not stop them from commending the Buchanan Report for its conclusion that

‘Parking on the highway or any form of publicly subsidised parking are in the nature of concessions which should be zealously safeguarded by the public authority.’³

What is to be done about the planning regulations that require developers to provide parking space in new buildings, even when there is no chance of recovering their cost?

¹ HMSO, 1965, para. 103

² *Ibid.*, para. 105.

³ *Ibid.*, para. 118.

One possibility would be to abolish the requirement and leave it to the developers to provide parking space to the extent that it is in their interest. It is difficult to recommend this policy. Even if property developers were deemed to know what was best for their tenants at the time of the construction of the building, they cannot be relied upon to allow for future requirements. Nor can anyone else. Local authorities make an attempt, but it is not at all clear that the present town planning requirements accord with the public interest.

As an alternative, it might be better that developers should be required to design their buildings in such a way that certain sections of them could be used for parking, but also for another purpose such as storage. It could then be left to the developer (or to the occupiers of the building) to decide how to use this space. This would probably result in the space being used by whoever was prepared to pay most for it. It is difficult to see any logical reason for the planning authorities to demand that parking space be used by some people rather than others, or even that it should be used only for parking. It would surely be sufficient for the regulations to ensure that ample space *suitable for parking* is included in all new development. It could then be left to the owners of the space to decide upon its disposal.

IV. THE PROBLEM OF RESIDENTS

Street parking

Parking meters can help in promoting the more efficient use of street parking space, but they can impose inconvenience and even hardship on frontagers (users of premises in front of which meters are situated). Hardship or inconvenience can result in two ways:

(a) having to pay for the use of space once available without charge; and

(b) being unable to approach one's frontage owing to the presence of another vehicle at a meter, even where the frontager would be willing to pay the full meter charge—or more—for the

right to park in front of his premises, or to prevent someone else parking there.

The first kind of difficulty is unavoidable. Road space is a scarce resource, and it is desirable that people who use it should pay its price. But some of the difficulties of the second type could be overcome by special meters which, for want of a better name, might be called 'Householders' Meters'.

The 'Householder's Meter' would be similar to the ordinary parking meter except in its financial arrangements:

(a) The rent for the meter would be paid by the frontager to the local authority on a long-term basis, say, by the month or by the year.

(b) All monies paid into the meter would be collected by the frontager who would have the key to the cash box.

(c) The frontager would have the right to 'hood' the meter at any time, and so reserve the space for his own use and deprive himself of income from the meter.

Thus the 'Householder's Meter' would be similar in some respects to a coin-operated telephone in a shop or private house which is available to the public when not required by the subscriber. (The subscriber pays the telephone bill and retains the coins put into the telephone box.)

What should the meter charges be? As suggested earlier, the hourly charge should be such that, taking any group of meters in a street or square, a proportion would be vacant at most times, that is, the casual visitor should be 'reasonably' certain of being able to park at any time. It would obviously be unacceptable for a square to be full of residents parking at 3d. an hour and thus keeping away outsiders who would be prepared to pay 6d. an hour.

What should the annual meter rent be? The local authority should charge the full amount the meter is expected to earn during the hire period assuming it was never hooded.

Supervision would be the task of the local authority which would summons offenders and collect fines.

Who would have the right to 'subscribe' to a 'Householder's Meter'? There might be a number of occupants of a building anxious to do so. The solution might be to give the right to the

person nominated by the owner of the property. In practice this would probably lead to the privilege being put up for auction and allotted to the highest bidder.

There would be other details to decide but there do not seem to be any major difficulties other than the question of principle: is it right that the frontager should have 'first refusal' to use parking space in front of his premises at the prevailing market price? From the economic point of view it is right, because it does not usually matter to the visitor from outside which meter he uses, but to occupiers of premises it is sometimes important to have the use of 'their' meter spaces.

Under a scheme of this kind there would, of course, be no cash profit to frontagers. By paying the meter fees they would be acting as (unpaid) meter-collectors and would relieve the local authority of a troublesome task. Nor would frontagers be obliged to participate in such a scheme. The benefits to frontagers would arise from their ability to use parking space when its value to them exceeded the meter parking charge.¹

'Householders' Meters' were first conceived² for use in residential or semi-residential areas and to enable people such as doctors to have the street parking facilities they are prepared to pay for. (Harley Street might be a suitable street for meters of this kind.³) But there is no reason why these meters should not be used in commercial areas to enable stores, restaurants, hotels or theatres to 'reserve' space for unloading or for their customers. *As long as the basic pricing principle is followed that the price is pitched high enough to leave vacant spaces for 'casuals' at most times*, there seems much to be gained by giving all frontagers first refusal of the metered space in front of their premises.

Off-street parking

There remains the difficult question of parking space in residential districts for cars now parked in the streets. Many streets are already chock-a-block with parked cars, and the increase in car

¹ It could be argued that frontagers are therefore prepared to pay a higher price than outsiders, and it is arguable that since the demand differs the public revenue would be higher.

² G. J. Roth, 'Parking Where You Live', *Guardian*, 10 December, 1962.

³ Others who could benefit are Ministers of the Crown. They might find the system less embarrassing than 'the customary exemption of a Minister from parking regulations outside the official residence'. (*The Times*, 18 June, 1965).

ownership is bound to transform a difficult situation into one of crisis.

'Householders' Meters' could help frontagers, but they would not increase the number of available spaces. Basically the problem can be resolved only by an increase in off-street car parks. As usual it is necessary to ask: who is going to pay?

It is not helpful to look to local authorities to provide car parks for residents out of public funds. In the first place it would lead directly to non-car-owners subsidising car-owners, which would be taxing the poorer to help the richer. Secondly, any such arrangement would give a bonus to existing residents at the expense of people living outside. If Mr. Smith who lives in Chelsea had the right to use a local car park at a subsidised rate, he would be given a privilege that would enhance the value of his residence. The value of a Chelsea house sold 'with parking licence' would rise, and newcomers to the area would have to pay the market value of the parking privilege in the enhanced value of Chelsea houses. They would have to pay the enhanced value—and of course some of the rates that would go to subsidise the car park—even if they were not car owners. Any solution involving financial discrimination in favour of residents would run up against this sort of difficulty.

On the other hand, the straightforward solution of prohibiting street parking and forcing cars into unsubsidised off-street car parks must also be rejected. It would undoubtedly impose hardship if people were faced with the *immediate* choice of giving up their homes or giving up their cars.

The best results might be obtainable from a compromise solution on the following lines. Private firms—or, failing that, local authorities—could construct off-street car parks in residential areas and let them at rentals that increase year by year. They could aim at charging a fifth of the economic rent in the first year, two-fifths in the second year, three-fifths in the third and so on, until the full rent was payable in the fifth and subsequent years. This would give residents the choice of getting used to paying, giving up their cars, or moving out, but there would be a suitable interval of time for adjustment to the new conditions.

Many people prefer parking outside their houses to using a car park. Few people would pay to use a car park so long as free parking was allowed outside their front doors. It therefore follows

that payment for street parking would have to be introduced simultaneously with the provision of the off-street car parks, either by parking meters or one of the other charging systems referred to earlier (pp. 26-28).

In residential areas the revenues from street parking might be used to meet the losses incurred on the car parks in the initial years. But once the car parks were covering their costs, the revenues from street parking should be used by the local authority to offset the costs of general community services such as street lighting which people cannot arrange for themselves individually.

V. PARKING RESTRICTIONS AS A MEANS OF RELIEVING TRAFFIC CONGESTION

One of the consequences of treating parking space as a 'special' commodity is that it is often considered not as something in its own right but only in its relation to other things. The idea that parking space should be provided regardless of cost in order to stimulate trade has been discussed in Section I. What of the view that parking should be restricted in order to relieve traffic congestion?

The Buchanan Report

The idea that parking restrictions could—and should—be used to relieve congestion on the streets is taken for granted by many people. For example, the authors of the Buchanan Report on *Traffic in Towns* put the matter as follows:¹

'We think it will be necessary for transportation plans to be based on a conscious decision regarding the extent to which the demand for the optional use of cars can be met. The plans should contain measures to influence the demand so that it matches the provision that can be made. There is very little experience available at the present time of the best methods for influencing the demand, but in principle there appear to be four possibilities:

- (i) A system of permits or licences could be used to control the entry of vehicles to certain defined zones . . .

¹ HMSO, 1963, paras. 451-2.

- (ii) A system of pricing the use of road space . . .
- (iii) Parking policy.
- (iv) Subsidising public transport so that it offers considerable financial advantages over the use of cars.¹

'Of these four methods (which could perhaps be used in combination) everything points to the immediate importance of parking policy. It appears absolutely essential that the public authority should retain complete control of:

- (i) The amount of parking space that is provided,
- (ii) its location, and
- (iii) the charges that are levied,

and it should be prepared to use this control methodically as part of the implementation of the transportation plan. It would not, we think, be sufficient to say that "economic charges" (i.e. charges related to the securing of a reasonable return from the capital cost of providing the parking space) should be levied for parking, *we think it is necessary to levy whatever charges the circumstances demand.*' (My italics)

The implications are clear: parking charges should not necessarily be related to costs, and parking space should not necessarily be provided for the use of people willing to pay for it.¹ The interests of 'the transportation plan' may require parking restrictions to be used as a means of reducing the demand for road space.

There is a very strong case for the removal of parking subsidies of all kinds, and it is likely that this itself would considerably relieve traffic congestion. But the idea that parking should be subject to restraints *above the costs of providing parking space* is a completely different proposition. Is such a policy likely to have desirable consequences? Is it likely to succeed?

The logic of a parking tax

When considering the desirability of a policy it is important to bear in mind the object to be sought. It is easy to suggest

¹ An illustration of the way in which this section of the Buchanan Report has been understood was given in the *Evening Standard* of 9 June, 1965. A Westminster City councillor who objected to a new car park being leased to a commercial firm was reported as saying: 'the object of a commercial operator is to make money and he will adjust his prices and hours of opening to achieve this. The firm may decide to advertise, "Come to Savile Row and get your suit made and park nearby." This is contrary to the spirit of the Buchanan Report and other traffic surveys, which have advocated keeping the private motorist out of the town centre.'

arbitrary measures to keep some types of traffic out of congested areas. Proposals are often made to keep out lorries, or delivery vans, or 'non-essential' vehicles, or even all vehicles. The object of policy should not be to reduce the volume of traffic but to obtain the maximum benefit from the road system. This object cannot be achieved merely by forcing a stated *amount* of traffic of any and every kind off the road; it is necessary to discourage the vehicles that obtain *least benefit*.

Measures to relieve traffic congestion by parking restrictions would favour those whose vehicles pass through city centres without parking there, and would restrict only those who live, work or trade in the area under restriction. But vehicles that park in an area do not necessarily obtain less benefit from its road system than vehicles that do not park. Through traffic can often avoid central areas without loss; not so traffic with destinations in the central areas.

When the effects on city activity are taken into account, it becomes difficult to understand how anybody who wishes the city to survive as a centre of trade and amenity can advocate encouraging through traffic at the expense of parking traffic. The results can clearly be seen in America, where many city centres, such as Boston, are reduced to corridors for moving traffic with residents and trade moving to the outskirts.

The policy of relieving congestion on the streets by parking restriction is thus of doubtful value. Could it be implemented? How could the parking restrictions be imposed? In practice the choice is between two methods: either the price of parking could be raised by a parking tax, or else non-monetary measures—such as the restriction of parking by time limits—could be introduced.

These two methods of rationing available space have been compared in Section II, where it was shown that restriction by price has important advantages over restriction by time limitation. However, even those who favour time limitation—as a method of helping local trade, for example—can hardly advocate it as a method of reducing congestion on the streets, except where congestion is mainly due to peak-hour travellers who are long-term parkers. Restriction by time limits might bring about a high turnover of cars in parking spaces, but for this very reason it is not an anti-congestion policy.

It follows that to be effective an anti-congestion policy would have to include a tax on parking. This is a pricing solution to the problem of traffic congestion, the price being payable on the termination of the journey.

The operation of a parking tax

How would the system work? In the first place it would be necessary to prohibit free parking on the streets and to stop the subsidising of parking off the street. The prohibition of free street parking would presumably be done by prohibiting *all* parking where parked cars perceptibly impede traffic flow and allowing metered parking in other places. There is everything to be said for making the car parker pay the full costs of the facilities he wants in city centres.

The price of parking in city centres would thus be forced up, and it would eventually reach the level at which it would be high enough to cover the costs of providing parking space. At this point people and firms with space in yards and warehouses would be tempted to offer it for car parking, and commercial operators would want to start building car parks for business and residential users. Thus the number of car parking spaces available would tend to rise as a result of allowing a market to evolve out of normal economic activity and this would attract traffic into the area.

The authorities might beyond a point have to take steps to restrict the increase of parking space. Their problem would be to keep the price of parking space high enough to restrain demand, and at the same time to inhibit the market forces tending to increase the supply.

The obvious step would be to tax the parking spaces in the central area so that parkers would have to pay not only the cost of providing these spaces but also a tax. However, it is at this point that difficulties would be likely to arise.

In the first place, residents in the area would find themselves having to pay not only the full costs of parking (on the street or in garages), but also a tax designed to reduce congestion on the roads. They would be sure to raise strong objections which would be justified, particularly in the case of people who cause no appreciable congestion on the roads because (for example) they use their cars only at night and at weekends. It is one thing to tell

residents of St. Marylebone and Mayfair that they cannot go on parking at the public expense; it is quite another thing to tell them that they must pay a tax on their parking garages, and enhanced fees at meters, in order to discourage commuters and other people who congest the roads, some of which are approach roads outside their area. It might be possible to mitigate this difficulty by providing car-parking accommodation at reduced rents to residents and by exempting them from the tax on parking space, but any scheme of this sort would have its own difficulties and anomalies.

The second difficulty is that the authorities would not be able to 'control' the number of parking spaces available or the price charged for their use. So long as it is not profitable to provide parking space and it is provided either by local authorities or at their insistence, it is a relatively simple matter for the local authorities to control the number of parking spaces in their area. The position would become very different once it became *profitable* to provide parking space. There is a world of difference between controlling the growth of a facility which no one wishes to provide and restricting it when it becomes profitable—when restriction prohibits deals between willing buyers and willing sellers. There need be no difficulty in using planning powers to prevent the construction of large car parks, despite the inevitable pressures of interested groups. But there would be difficulty in preventing the small man from parking cars on his own premises—either his own car, or those of staff or 'friends'. The number of parking places that could be made available in this way would vary from area to area, and in some places, for example in towns containing cheap central commercial property, it could be large enough to be troublesome. If this activity were taxed, there might have to be a licensing system which would license every private parking place in the control zones, and administrative measures would have to be taken to ensure that yards, storage premises, and other places were not used for 'unlicensed parking'.

The problem of non-parking traffic

We have reached the point at which parking prices are high enough to induce more spaces to be provided, and there is now a tax on them designed to limit their usage. Would this resolve the problem? In the short run it possibly could, but in the long

run it could not, as the authorities would be faced all the time not only with an increasing demand for road space, but also with an increasing proportion of *non*-parking traffic, i.e. traffic that does *not* pay the tax. There will always be some vehicles that will not pay the parking tax¹ and, under the system being discussed, this proportion would tend to grow.

It therefore seems that, with non-parking traffic growing both relatively and absolutely, the authorities would not be able to maintain traffic speeds at a desired level merely by keeping the number of parking places constant. They would have to take measures to *reduce* them.² The only way in which this could be done would be to make the tax on parking places so high that the number required would *fall*. The logic of the policy would therefore be towards a continual reduction of the number of parking spaces available by an increase in their price coupled with a continual increase in the proportion of through traffic using the roads at an 'acceptable' level of congestion. Such a policy must break down sooner or later.

The fundamental difficulty with proposals to relieve traffic congestion by parking restrictions is that there is no definite relationship between parking space and traffic flow. Any attempt to discourage the use of road space by restricting the use of a commodity associated with it—such as parking space—is likely to succeed only if there is a close connection between the use of road space and the use of the commodity chosen for restriction. Thus if all whisky drinkers—and only whisky drinkers—were to drink from tumblers, it would be feasible to discourage the consumption of whisky by a tax on tumblers. But as some whisky drinkers do not use tumblers, and as many who do use tumblers do not use them for whisky, a tax on tumblers would be an inefficient way of discouraging the consumption of whisky. It would certainly encourage many who drink whisky from tumblers to go straight to the bottle.

The relationship between the use of road space and of parking space is similar. There are many people whose cars congest city centres but who do not park there. As long as space for moving and space for parking are not used in fixed proportions, a traffic

¹ 'If all car parking (on-street and off-street) in this area were banned it would effect a reduction in traffic of 21 per cent.'—*Report of the Working Party on Piccadilly Circus*, HMSO, 1965, para. 75.

² I am indebted to Dr. M. E. Beesley for this point.

policy based on parking restriction will in itself cause a shift towards more use of space for movement. It is not only that parking controls would not deter 'non-parking' traffic; the very success of parking controls in reducing congestion (by forcing some of the 'parking' traffic off the roads) would make the area more attractive to 'non-parking' traffic. In London, for example, such a policy would result in an increase in the amount of goods traffic being sent to the docks by heavy lorries rather than by rail.

Conclusions

These considerations suggest that any attempt to relieve traffic congestion by special parking restrictions would be of dubious merit and probably unworkable. There are good arguments for removing parking subsidies, and this in itself could have beneficial effects on congestion. But attempts to go further, and to force parkers to pay more than the cost of parking, would be unjust, inefficient and likely to distort traffic patterns in an undesirable manner.

The straightforward way of dealing with the problem of congestion is to 'let each tub stand on its own bottom'; let those who want their cars to use parking space pay the costs arising out of parking, and those who want their cars to move in congested conditions pay the costs arising out of movement.

VI. SUMMARY AND CONCLUSIONS

SECTION I

1. There is an acute shortage of parking space in many parts of Britain. Before dealing with the problem it is necessary to decide whether space for parking should be supplied as a 'social service' or in accordance with 'commercial' criteria. The object of this *Paper* is to explore some of the consequences that would result from treating parking space as an ordinary commodity to which the normal commercial criteria apply.

2. The basic principles that would follow the commercial approach are: (a) that existing parking space should be made available to those who are prepared to pay the most for it, and (b)

that additional parking spaces should be provided if—and only if—car parkers are prepared to outbid others for the use of the necessary resources.

3. Although there may be a good case for subsidising some commodities, parking space should not be supplied at less than cost, except as a temporary measure. Parking subsidies are undesirable both on general welfare grounds and for reasons that apply specifically to transport.

4. There should be a legal limit on the extent to which local authorities are allowed to subsidise parking from the rates.

SECTION II

5. Street parking spaces should be allocated by a pricing system aimed at balancing supply and demand. There is no case for rationing parking space by time limits. The price mechanism could be applied by the flexible use of parking meters, but other charging methods are also possible.

6. The economic use of parking meters would increase both gross and net revenues, and the profits should be used by local authorities to offset some of the costs of community services.

SECTION III

7. Off-street car parks should be provided whenever the revenues from them are high enough to cover their costs. They should preferably be supplied commercially by private enterprise.

8. Private enterprise is now discouraged from entering this market by free street parking, subsidies to car parks by local authorities, and planning regulations.

9. Planning requirements should insist on the generous provision of space *suitable for parking* in all new development, but the decision on how to use the space should be left to the occupiers concerned.

SECTION IV

10. In dealing with residential areas there is a strong case for giving residents 'first refusal' in the use of parking space outside their houses. Provided they are prepared to outbid others, residents could exercise this privilege by means of 'Householders' Meters'.

11. In the long run only the provision of off-street parking spaces can deal with the situation. These could be provided at commercial rates, though for a limited period reduced fees could be charged to ease the transition from free parking to parking at full economic charges.

SECTION V

12. The relief of traffic congestion by special parking restrictions can do much harm and is unlikely to succeed. Parking subsidies should be removed, and this in itself would have beneficial effects on congestion. But attempts to force parkers to pay more than the cost of parking would be unjust, inefficient and likely to encourage through traffic at the expense of local traffic.

QUESTIONS FOR DISCUSSION

1. Discuss the case for and against using the price mechanism as the method of allocating scarce car-parking space. Is there any difference between street-parking and off-street parking?
2. Examine the proposition that parking subsidies out of rate funds transfer income or wealth from the poorer to the richer.
3. Discuss the proposition that it is better—in the general interest—for eight cars to use a parking place for one hour than for one car to use it for eight hours.
4. How should parking-meter profits be used?
5. Under what circumstances should local authorities enter the car-parking business?
6. Discuss the case for and against a 'National Parking Authority'.
7. Is it right to assume that the cost of land for underground car parks is negligible?
8. Discuss some of the problems of assessing the demand for parking space at prices that cover costs.
9. Discuss the use of parking restrictions as a means of relieving traffic congestion.
10. 'Willingness to pay for parking space is an accurate measure of need'. Discuss.

FURTHER READING

CAR PARKING STATISTICS

Statistics relating to parking in Britain are meagre. There is no official body responsible for collecting and publishing statistics on car parking, and although information on parking meters is available from the Ministry of Transport, there are no comprehensive figures of any kind on off-street parking facilities.

The British Road Federation attempted to fill this gap by means of sample surveys in 1961 and 1963, and the findings were published in the following reports:

Car Parking—A National Survey, British Road Federation, November 1961. (Results of the 1963 survey published in May 1964).

Information on parking meters in Britain is given in the paper referred to in the text:

Duff, J. T., *Traffic Management in Towns*, paper presented to the Seventh International Study Week in Traffic Engineering, World Touring and Automobile Organisation, London, 1964.

THE ECONOMICS OF CAR PARKING

Glassborrow, D. W., 'Parking Charges and Parking Meters', *Westminster Bank Review*, November 1961.

Day, Alan, *Roads*, Mayflower Paperback, 1963.

This excellent little book contains a lucid chapter on 'The Parking Problem'.

Fitch, Lyle C., & Associates, *Urban Transportation and Public Policy*, Chandler Publishing Company, San Francisco, 1964.

The chapter dealing with 'Economic Considerations in Urban Transportation Planning' contains interesting material on parking.

Roth, G. J., with a statistical appendix by W. B. Reddaway, *Parking Space for Cars: Assessing the Demand*, Dept. of Applied Economics Occasional Paper No. 5, Cambridge University Press, September 1965.

Discusses some of the methodological problems involved in assessing the demand for parking space, and gives the results of parking surveys carried out in Cambridge, Luton and Liverpool.

Roth, G. J. and Thomson, J. M., 'The Relief of Traffic Congestion by Parking Restrictions', *Town Planning Review*, October 1963.

Various possible ways of using parking controls to relieve traffic congestion are discussed, and examples are given of the benefits obtainable.

GENERAL INFORMATION ON PARKING

Knight, Rena G., *The Parking Problem. A Digest of the Literature*, Library Communication No. 154/RGK, Road Research Laboratory, April 1950; supplementary reviews published March 1954 (No. 319/RGK), February 1958 (No. 626/RGK).

These digests contain 92 references arranged in subject order together with summaries of some of the items referred to.

Brierley, John, *The Parking of Motor Vehicles*, C. R. Books Ltd., London, 1962.

This is the first British comprehensive book on car parking and contains much useful information on parking legislation, the organisation of street and off-street parking, and the construction of different types of car parks.

Seymer, Nigel, 'The Parking Problem—a Survey of Parking Garages', *International Road Safety and Traffic Review*, Autumn 1960.

One of the best of the articles describing the different types of parking garages.

The Eno Foundation for Highway Traffic Control of Stoughton, Connecticut, has published a number of books on parking, including the following:

Burrage, R. H., and Mogren, E. G., *Parking*, 1957.

Ricker, E. R., *Traffic Design of Parking Garages*, 1957.

Whiteside, R. E., *Parking Garage Operation*, 1961.

GOVERNMENT PUBLICATIONS

Most of the British Government's publications on car parking are referred to by Brierley (see above). One of the most important documents is:

Report of the Working Party on Car Parking in the Inner Area of London, HMSO, 1953.

This report suggested the introduction of parking meters. It contained the celebrated reservation by Mr. (now Professor) C. D. Buchanan in which he objected to subsidies for long-period parking.

Ministry of Transport, *Parking—the next Stage*, HMSO, 1963.

Shows the official attitude to the parking problem in 1963. This booklet favours the flexible use of parking meters to allocate street parking space, but only to short-term parkers. It suggests that a realistic charge for street parking in the inner area of London is within the range 2s. to 5s. an hour.

Ministry of Housing and Local Government, *Parking in Town Centres*, No. 7 of the Ministry's Planning Bulletins, HMSO, 1965.

This publication illustrates the confused thinking that is prevalent on the subject of parking. The Bulletin does not set out the objects of parking policy and falls back on such generalities as 'proper parking provision', 'comprehensive parking policies' and similar undefined clichés. It is ambiguous on the question of subsidies. The section on estimating parking demand contains no hint that the price of parking might affect the number of spaces required.

APPENDICES

APPENDIX 1

*The costs of providing off-street parking spaces*¹

Providing parking space entails construction, operating, and land costs. These elements vary in different parking situations. Some do not occur at all; for example, when cars are parked underground the land costs can be negligible, and when on an open site there are very low construction costs. It is generally possible to economise on one element by increasing expenditure on the others; for example, space and hence land costs—can be saved in a parking garage by employing attendants to pack cars closely.

It is impossible to generalise about the costs of parking space; the following information only illustrates the magnitudes involved. For accurate figures it would be necessary to prepare detailed proposals based on the costs at the expected construction dates.

Construction costs

These vary within very wide limits. The cheapest structures—those with open sides—usually cost £250 to £350 per car space. An enclosed structure costs more, not only because of the additional cost of walls but also because once a structure is enclosed it is necessary to provide a high standard of ventilation and fire-fighting equipment. Structures of this type may cost £400 to £600 per car space.

There are some very sophisticated mechanical car parks with lifts and trolley systems that automatically transport cars from the reception area to a parking bay on an upper storey. Costs range from £500 to £1,000 per car space.

The most expensive car parks are probably the underground ones because of the inherent difficulties in building underground and the stringent town planning requirements for ventilation and fire-fighting systems. The range of cost is probably £1,000 to £1,500 per car space.

Operating costs

The main cost under this head is wages. Where attendants have to park the cars, it is usually reckoned that one man is required for 30 spaces. This alone can come to £25 per car space per year, although in slack times it is possible to employ some of the attendants on other duties, such as servicing cars or serving petrol. Other costs include insurance, cleaning, lighting, repairs, maintenance and miscellaneous charges, which come to at least £10 per car space per year.

¹ Most of the work on which this Appendix is based was carried out at the Department of Applied Economics of the University of Cambridge.

EXAMPLES OF THE COSTS OF PROVIDING OFF-STREET PARKING SPACE

		Open-site		Underground		Multi-storey car park (6 storeys)			
		car park	car park	Customer parking	Attendant parking	Mechanical parking			
A. Construction and operating costs									
1. Capital cost of construction	£50		£1,200	£480	£480	£720			
2. Annual construction charges at 10 per cent of capital costs	£5		£120	£48	£48	£72			
3. Annual operating costs	£10		£15	£15	£35	£25			
4. Total of annual construction and operating costs	£15		£135	£63	£83	£97			
B. Land costs		Land costs per sq. ft.		Annual charges per square foot for rent and rates, at 10% of capital costs		Land required		Land required	
		Capital costs	Annual charges	Capital costs	Annual charges	Capital costs	Annual charges	Capital costs	Annual charges
		per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.
10s.	£13		0	£2	£2				£2
50s.	£65		0	£12	£9				£8
£10	£260		0	£50	£38				£33
£20	£520		0	£100	£75				£67
C. Total of construction, operating and land costs		Land costs per sq. ft.		Annual charges per square foot for rent and rates, at 10% of capital costs		Land required		Land required	
		Capital costs	Annual charges	Capital costs	Annual charges	Capital costs	Annual charges	Capital costs	Annual charges
		per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.
10s.	£28		£135	£65	£85				£99
50s.	£80		£135	£75	£92				£105
£10	£275		£135	£113	£121				£130
£20	£535		£135	£163	£158				£164

1. NOTES Section A of this Table deals with construction and operating costs. For each of five different kinds of car park there are given the initial construction cost per car space (line 1), the annual charges to meet this cost (line 2) and the annual operating cost (line 3). The total annual costs covering construction and operation are shown in line 4. Section B deals with the land costs. The first column gives four examples of land costs; the second column shows the annual charges for rent and rates corresponding to these costs and the remaining five columns show them applied to each of the five kinds of car park. The land costs associated with underground car parks are assumed to be nil, as only negligible surface space is required for their provision. Section C sums the figures shown in A and B. The first two columns show the capital and annual charges once again, and the remaining five columns show the appropriate totals for each of the five kinds of car park. 2. All the figures are subject to considerable variation and are given merely to illustrate the orders of magnitude of the costs involved in the provision of car parks.

Land costs

The cost of land for parking is determined by its value in the most profitable alternative use. Planning regulations do not always allow land to be developed in its most profitable use, but they do not detract from the intrinsic value of the land. The withholding of planning consent can be taken to mean that in the view of the planners, the community receives a larger benefit from the land in its undeveloped state than it would if the land were put to a more profitable commercial use. That hotels are not built in Hyde Park does not mean that the land in Hyde Park is not valuable but that the community (presumably) prefers to forego the rent obtainable from the hotel developer in order to maintain the amenity of the park.

The cost of land varies enormously. It has been estimated that in central London building land can be worth £50 to £100 per square foot along main roads and £5 to £10 per square foot along side streets. The value of residential land in an outer suburb can be about 3s. per square foot. Annual rental values are normally taken to be 5 to 10 per cent of the capital values.

The space required by a car depends on the type of car park. If customers have to park their cars in a garage it is usual to allow for at least 300 square feet per car space. Less space—say 260 square feet—is required on open sites, as there is no need to allow for pillars and similar obstructions. These figures appear high, but they must allow for adequate clearance between cars and also for access by cars and drivers.

In car parks which employ attendants to park cars close to one another it is possible to save a quarter of this space, and in mechanical car parks a third.

Summary of costs

Some of the figures given above are summarised in the Table which illustrates possible costs of different kinds of car parks when the annual costs of land and rates are 1s., 5s., 20s., or 40s. per square foot. These costs are also given diagrammatically in the graph, on page 60 which shows how total parking costs vary with the cost of land.

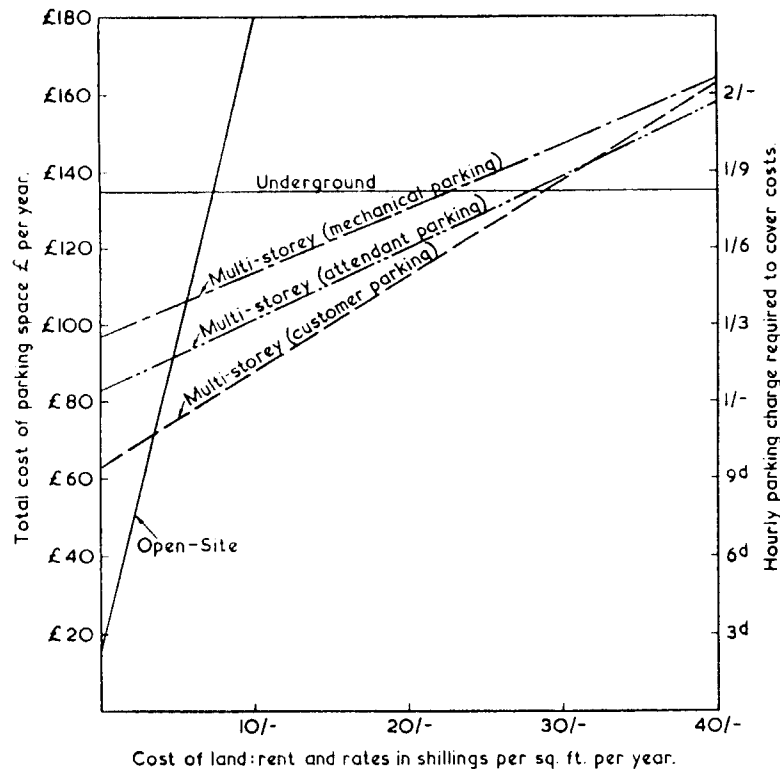
In these examples the annual cost of the structure is taken as 10 per cent of the capital cost (including interest charges and depreciation).

There are considerable difficulties in estimating the rates payable for car parks. For the purposes of the examples it is assumed that the annual land and rate costs together amount to 10 per cent of the capital cost of the land.

Parking charges to cover costs

Unless a car park can attract evening or week-end custom, it will probably be in business for not more than 2,000 hours a year—50 weeks of 40 hours each. If it is further assumed that there will be 80 per cent utilisation, a parking charge of 1s. 3d. an hour would be necessary to meet costs of £100 a year. Similarly, an hourly charge of 6d. would meet annual costs of £40 a car space, and an hourly charge

GRAPH SHOWING RELATION BETWEEN PARKING COSTS AND LAND COSTS



of 1s. would meet annual costs of £80 a car space. These charges make no allowance for profit, which is also a cost since otherwise investment would not be attracted.

The graph shows that an open-site car park on cheap ground cannot meet its costs if it charges much less than 6d. an hour. Where multi-storey car parks have to be built, the minimum economic charge exceeds 9d. an hour, even with land costs at 5s. per square foot per year, which is equivalent to a capital cost of £100,000 an acre. Where the cost of land is £1 to £2 per square foot per year it becomes worth using the more expensive types of multi-storey car park or to go underground. The economic charges may then be 1s. 6d. to 2s. an hour.

Estimating the demand for off-street parking space

To the economist, 'demand' means the number of units of a commodity or service bought in a given period *at a price*; the term is meaningless unless a price is stated or implied because demand varies with it. Yet most of the parking surveys carried out in this country and in the USA attempt to assess the demand for parking space without taking account of the price of parking. In other words, they assume that it will be both free and nevertheless available in unlimited amounts. The information obtained from such surveys can hardly be used as a basis for planning parking space in a society where most other commodities have to be paid for, because there is not enough of them to satisfy unlimited demand at zero price.

If the value of land in an area is 1s. per car space per hour, the relevant question for planning ought to be not how many people would like to park in that area for nothing, but how many would like to park at the charge of 1s. an hour. Unless price is brought into the surveys they tell us nothing about the intensity of the demand for parking space.

The problem is to assess the likely usage of parking space *at different parking charges*. It is not possible to get an answer merely by counting the cars parked in the vicinity when no charges are imposed. Charges would discourage some that park for nothing and the spaces vacated would attract others whose owners *are* prepared to pay for convenient parking. There is no easy method of calculating in advance the likely effect of different parking charges on the usage of parking space.

In an attempt to obtain some information on the economic demand for parking space, the Department of Applied Economics of the University of Cambridge recently tried to obtain data from sample surveys. The problems that were encountered, the methods used and the main results are described in the DAE Occasional Paper No. 5.¹ The basic factual results can be summarised as follows:

1. In all the areas there was considerable 'frustrated' demand for parking space by people who said they were *willing* to pay for convenient parking spaces but who did not even bring their cars into the areas because of the difficulty of finding any. The 'frustrated' demand varied between 9 per cent to 137 per cent of usage in different areas; 29.4 per cent was recorded for short-term parkers in one area.

2. The effect of price on the demand for parking space was found to be small for prices of up to 1s. an hour. The elasticities of demand² were under 0.1 for many of the parkers, and under 0.6 for most of them. In no case was the elasticity more than 1.

¹ G. J. Roth, *Parking Space for Cars: Assessing the Demand*, Cambridge University Press, 1965.

² The elasticity of demand at a price can be defined as the percentage change in the amount demanded that would result from a change of 1 per cent in the price. For example: when the elasticity of demand is 0.1, a rise in price of 10 per cent would bring about a fall in purchases of 1 per cent.

3. There was considerable variability in the effect of price on parking requirements. The longest and most frequent parkers tended to be those most affected by price changes. Many motorists who parked their cars while at work said they would be deterred by a charge of 3d. an hour; on the other hand, a considerable number, including many heavy parkers, said that they would continue to park even at prices of 1s. an hour.

4. The demand for parking space was very sensitive to the position of the car park. Where parkers were offered a choice between a high and a low price, many opted to pay the higher price for the convenience of parking in the car park of their choice.

These results suggest that there is a considerable demand for convenient parking space at 1s. an hour or less; and that even at higher prices there is likely to be keen demand for parking at the most popular sites. A parking policy based on higher charges than current ones is likely to lead to a change in the type of parker rather than to a change in the volume of parking. Short-term parkers would replace long-term ones; shoppers would replace people at work. But it is unlikely that if charges were raised to the range of 9d. to 1s. 6d. an hour—that is, to a level that can cover costs on all but the most expensive sites—the amount of parking in city centres would change very much.

APPENDIX 3

Devices for Pricing the use of congested Roads

The reasons for devising better pricing methods for the use of roads are that, in the short term, an efficient pricing system could provide both a criterion and a method of restraint whereby 'essential' vehicles could be allowed to enter congested areas and 'inessential' vehicles restrained, and in the long term, they could provide guidance on where improvements in roads would be most beneficial to road users and funds for improvements.

To consider the relative merits of pricing devices it is necessary to decide what that will have to do. This was done by the Smeed Committee which listed in its report¹ requirements for the ideal system. The following ten points cover the most important requirements:

1. Charges should be closely related to the amount of use made of the roads. People who use congested roads a great deal should pay more than people who use them only occasionally by making the charges proportional to the distance travelled, or the time spent, on them.

2. Charges should be flexible. It should be possible to vary the charges between peak congestion and other times, and to allow road use at little charge when there is no congestion, i.e. at night. Vehicles

causing heavy congestion—lorries, for example—should be charged more than vehicles that cause little. There may also be a case for having different charges at different times of the year; for example, higher charges in the weeks before Christmas could encourage people to shop earlier.

3. Charges should be ascertainable in advance. Intending drivers should know the charges payable before making a journey because the object of road pricing is to influence the decision of people *before they use congested roads*. Any system that would impose heavy charges without giving prior warning would fail in its main purpose. For this reason there is no point in devising automatic systems whereby the price charged depends on the actual congestion in the area.

4. The charging method should be practicable, cheap to work, easily enforceable and acceptable to the public as simple and 'fair'.

5. Payment in advance and in small amounts should be possible. Any system requiring the state to issue invoices to millions of road users and collect road debts was rejected by the Smeed Committee. In view of the large numbers of transactions, payment in advance would be essential except in rare cases. On the other hand, drivers who wish to use congested road space should not be forced to pay out large sums in advance. Suitable units of purchase might be £1, £5, £10 and £50.

6. The equipment should be reliable. It should be designed to last many years under conditions of rough usage. Moving parts would have to be kept to the minimum. Equipment would also have to be difficult to tamper with.

7. The charging method should be capable of being used as part of a nation-wide system. It has been estimated that the car population in Britain might rise to 30 million before the end of the century. The system should be capable of embracing this number of vehicles.

8. The system should be applicable to charging parked vehicles as well as moving vehicles. There would be considerable savings in enforcement and collection costs if the pricing system could take the place of parking meters and other devices for charging parked cars.

9. The method should allow for occasional users. In addition to visitors from abroad there may be car users who would visit priced areas only rarely. These people should be covered by the scheme with the minimum of formality and delay.

10. The method should indicate the strength of demand for road space in different places. One of the big advantages of the pricing of road space is that it would enable users to show by their payments which stretches of road were the ones in most need of improvement. The charging system should enable the payments made on different roads to be known in some detail.

Off-vehicle and on-vehicle pricing meters

The first requirement, that charges should be closely related to the use of congested roads, makes it necessary to have a meter. Off-vehicle meters are remote-control units actuated by vehicles but situated at a

¹ *Road Pricing: The Economic and Technical Possibilities*, HMSO, 1964.

central computing station; they can be compared to telephone meters. On-vehicle meters are designed to record *on* vehicles and can be compared to taxi meters.

Off-vehicle systems incorporate identification devices on vehicles which enable a central computing station to receive information about the movement of vehicles in the pricing areas. All these systems would therefore have to have a method of identifying vehicles automatically; a method of transmitting the information from the pricing point, or the edge of the pricing zone, to the central computing station; and a method of analysing the information at the central station and allocating the charges to different vehicles.

None of these components has insuperable difficulties but off-vehicle systems would be costly. They would also have the following disadvantages: payment in advance would not always be easy to obtain, and the system would require centralised accounting, invoicing and progressing of bills; they would threaten the privacy of vehicle users, insofar as they would enable vehicle movements to be traced by the public authorities.

In view of these disadvantages—which do not seem to be compensated by any special advantages—it appears that off-vehicle systems should be rejected in favour of on-vehicle systems.

These systems can be sub-divided into two types: *Point pricing* and *Continuous pricing*. Under point pricing, vehicles would be charged as and when they pass fixed *pricing points* which would activate their meters. Under continuous pricing, vehicles would be charged continuously while within *pricing zones*, charging commencing on entering the zone and finishing when vehicles leave it. Further details of the metering devices are given in the Smeed Report referred to on page 62.

RECENT I.E.A. BOOKS

Advertising in Action

Advertising and the Public RALPH HARRIS & ARTHUR SELDON (1962, 30s. each)

The Way of Enterprise HARRY MILLER (1963, 30s.)

Competition for Consumers CHRISTINA FULOP (1964, 30s.)

Economic 'Miracles' J. HENNESSY, V. LUTZ, G. SCIMONE; with an introduction by J. ENOCH POWELL, M.P. (1964, 25s.)

Getting and Spending: An Introduction to the Market Economy J. W. ROCHE & G. R. JAMES (second edition, 1965: library edition 21s., schools edition 10s. 6d.)

Forthcoming

The City in the World Economy W. M. CLARKE (1965, 42s.)

Education and the State F. G. WEST (1965, 40s.)

PAPERBACKS

The Economics of the Colour Bar W. H. HUTT (1964, 5s.)

Journey to Coercian: From Tolpuddle to Rookes v. Barnard JOHN A. LINCOLN; with a foreword by SIR LINCOLN EVANS (1964, 6s.)

Rise of the Russian Consumer MARGARET MILLER (1965, 7s. 6d.; hard cover edition, 21s.)

A full list of books and pamphlets published by the I.E.A. is available on request. Please write to the address on the inside front cover.