

The Lancashire Road Plan: twenty years after

J. H. DEAN & J. DRAKE

Mr Dean

It is well known that road building or, indeed, road improvement in Britain has been largely carried out in three separate periods, two of them very short. Following the creation of the famous Road Fund, the period from the early 1920s until 1930 saw a large number of comparatively small schemes implemented. Thereafter, however, the economic depression of the early 1930s put an almost complete stop to new road construction until about 1935 when the monetary scene brightened and there was a rush to get on with quite a heavy road programme. This, of course, came to a sudden stop in 1939, and it was not until the mid-1950s that any appreciable progress could be made. The Road Plan for Lancashire was prepared in the middle of this post-war period of non-building, which was in a way a mixed blessing in that it did enable a highway network to be planned in a manner which, it was hoped, would give the maximum possible benefit per pound expended on actual construction.

70. In 1947 Lancashire, probably in common with most counties, had no comprehensive plan for improvements and new construction. A large number of individual schemes existed on paper, many of which were incorporated later in the Plan. This was the background when in 1947 Mr J. Drake, the County Surveyor, advised the Highways and Bridges Committee of the County Council of the desirability, indeed necessity, that a Road Plan for the county should be prepared.

Mr Drake

The Paper describes the results of original research carried out more than 20 years ago which have subsequently become well known due to the later and far more extensive research.

72. There is, however, more behind it than this. I am particularly concerned at the wastage of staff and money on extensive and expensive road studies when, in my opinion, far simpler methods would produce better results. I thought, therefore, that it would be useful to describe the methods used in Lancashire 20 years ago. We seem to suffer nowadays in every sphere of life from the efforts of far too many experts.

73. On p. 223 of the Paper the advantages of having a major project capable of being carried through in stages is mentioned. The Preston By-pass, an 8 mile section of the M6, is an excellent example of this.

74. One of the recommendations of the Report was that Lancashire should concentrate its resources on building a limited mileage of high standard road and leave alone the many miles of very attractive minor road inherited from the past. To me it is a real tragedy to see beautiful lanes being destroyed, when a new road will probably be built to take most of the traffic at a later date.

Mr F. A. Roberts, C. S. Allott & Son

My first contact with Lancashire was 20 years ago, in 1949, when I was employed as a Contractor's Engineer on the construction of the Woodhead new tunnel, which is a major feature of the Sheffield-Manchester railway. Today the stations along that line, some built only 20 years ago, are no longer needed and the line is now used only by goods trains. In the period of 20 years the use of that railway has declined, whereas the roads in nearby Lancashire have had to take a large additional volume of traffic.

76. It seems an obvious conclusion from this example that forecasting as an

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exercise is a necessary assumption in the design and construction of large works for the future, but how much should these assumptions be binding?

77. In 1949 an assumption was made for the Lancashire Road Plan that the traffic in the county would increase by 100%, but during the subsequent years there were many new factors which could have upset this estimate. For example, during the period 1953–1963 (a period three years after the Plan was drawn up) in the major industry of the county, cotton textiles, 1140 mills were closed and the working population employed in textiles in the county was reduced from approximately 300 000 to 100 000 in a period of sixteen years. Obviously this type of industrial setback could have affected the growth of traffic, but Lancashire people are adaptable and the empty mills were taken over by other concerns employed in the manufacture of electronics, plastic, paper and other products.

78. From the figures this change did not appear to affect traffic growth, but it will be interesting to hear the Authors' views as to whether this change of industry was assisted by the existence of a new road system which gives excellent communications to the rest of Britain.

79. I agree with the remark in § 61 that cost–benefit analysis is of limited use. Lancashire provides a particular lesson in using roads to rejuvenate an area. If a town with obsolete industry can be saved as a place for a community to live in by providing a new road network to bring its inhabitants to new industries outside the town, or, better still, bring new industries to the town, then surely this makes common sense? A new road worth, say, £6 million, aimed at rejuvenating a town of 100 000 inhabitants which has a capital value of at least £300 million is worth building, although the cost–benefit analysis does not take account of the capital value of a town. Could some formula be found for this which would be attractive to the economists?

Mr F. R. Oliver, Deputy County Surveyor, County Council of West Riding of Yorkshire

I was not engaged on the actual plan but spent some time in its implementation. It was a very comforting feeling to know that one was taking part in something with a future.

81. The policy of consultation and collaboration mentioned in § 8 has been proved right time and time again and I can remember very large meetings held in Lancashire to get the Plan across to the people affected. Now we are told that nobody must know that a new road is contemplated.

82. It is interesting to compare the speed at which railways were built with that at which motorways have been built.

83. Traffic figures have to be estimated continually and experience has shown how wrong many of the assumptions are. On the A1 in Yorkshire there has been a steady growth of 10% as against the Ministry of Transport's original estimate of 6%: this is the reason why Doncaster By-pass has dual two-lane carriageways (as indeed has the M62 Stretford–Eccles By-pass). At times it is carrying 50% more traffic than its theoretical capacity, and more traffic is going through Doncaster than before the By-pass was built.

84. On modern sophistication in design, the Worsley 'braided' junction on the M62 was evolved in 1961–62, when I was responsible for the route location of this motorway in Lancashire. We drew lines showing where the traffic would want to go, squeezed them together and passed them over to our traffic engineer, Mr Ogden, to sort out the weaving distances. I think there is a lesson to be learned here.

85. On critical paths, I agree with Mr Drake that the best way is to fix a target date and make the critical path fit this.

86. The Road Plan has justified the effort involved a hundred-fold. The roads in Lancashire have been built according to a proper plan and this lends point to the statement that it is a mistake to go back and alter something once it has been decided upon. Newcomers' reappraisals can only delay things.

87. Advance works are very important. It was vital to build the junction between the M62 and M1 within the M1 contract, but this was nearly frustrated because of delay in fixing the line of the M62, in spite of the fact that the choice was obvious. It was said that we would be 'pre-judging the issue', although the end of the M1 at that time was pointing at a row of houses in Leeds wherein the line of the urban continuation of the motorway had not been fixed.

Mr J. A. Gaffney, County Engineer and Surveyor, County Council of the West Riding of Yorkshire

I would wish to comment on § 59, as there are indeed many examples where re-appraisal has only really confirmed what an engineer with good judgement—backed with sufficient facts, of course—has decided. Re-appraisal can cause quite unnecessary delays.

89. I cannot resist commenting on the advantages that Lancashire seems to have achieved over the years in retaining its staff. If a team can be retained on a project and its morale maintained, this does make a very considerable difference to the rate of progress on a scheme. I agree entirely with § 63, where there is mention of a scheme proceeding to finality.

90. There is no doubt that there are certain areas of Britain in which the development of the road system is absolutely crucial to its future. One would not deny the need to attempt to work out a system of priorities based on reasonable assessment, but I am very dubious indeed of the value of a cost-benefit analysis, which often cannot include two of the most important factors, amenity value and benefit to a depressed area. Can Mr Drake go any further in his comments in § 61 where he touches on the need for the cost-benefit analysis to include an allowance for the above factors? I wonder how he feels this could be developed. Under the present system any benefits arising from generation of traffic or help for a new area really count for little.

91. A point which is of great concern at the present time is the degree to which highway projects need to be kept confidential. The Skeffington Report recommends discussions on planning matters from the beginning. In other words, the public must know and have the opportunity to consider matters. The Ministry of Transport advises that nothing be declared publicly until the line order is made. One can understand the reasons for this attitude but it is very difficult to apply in practice. It is almost impossible for a County Surveyor in this field of activity successfully to wear both his hats as the Chief Officer of a local authority and as the Chief Engineer of a participating motorway unit. I am sure that much of the success in promoting motorways in Lancashire and Yorkshire has come from consultation with local authorities and possible objectors from the early days, so that problems were ventilated and perhaps solved quite early on in the preparation of schemes.

92. Mention has been made of the dangers of prejudging issues as far as orders are concerned, but a real difficulty arises in the case of advance works. The Yorkshire side of the Lancashire-Yorkshire Motorway had an economic case for the early construction of about six bridges, but only one was started because of the possibility of prejudging an order.

93. The long-range planning blight to land and property referred to in § 66 is a critical matter. In the more highly developed urban areas there is often only one place left to site a proposed road, and to state that it will blight the situation if the discussions are held too early is almost ludicrous. Nevertheless, the present system is one that requires the Engineer to go through a long difficult process, including an economic justification, while the decision can often be judged on an obvious planning ground.

94. It is interesting to see from the plans in the Paper that the Preston-Yorkshire road shown in Fig. 1 is missing from Fig. 2. The Authors do not say that major work is, in fact, in the course of construction on this road in Lancashire. Now we in

the West Riding have to convince the powers that be that there is a need for the major work to be continued in Yorkshire!

Mr F. J. S. Best, Deputy Chief Engineer, Ministry of Transport

The Authors can certainly be very proud that so many of their proposals and forecasts have been proved correct by events. Between 1963 and 1968 about £115 million has been spent on roads in Lancashire. This is certainly not a small sum, and I hope that as a consequence the nerves, mental ease and physical health of the people of the county have been duly improved, as suggested by the Authors. Perhaps there is a case for transferring money from hospitals to roads in Lancashire to further the good work!

96. I note from the Paper that in 1949 the Authors considered that 30 years would be an appropriate period for a programme of works. I suggest that this is too long in this fast-changing world and that it would be unrealistic to plan more than about 15 years ahead, so that the problems of forecasting, planning blight, etc., are minimized. In the light of their experience I should like to know if the Authors still feel that 30 years is right.

97. I agree fully with the desirability of a programme of maintenance looking some years ahead, and no doubt this is one of the matters which the Marshall Committee is currently considering. Under present conditions I am not clear why authorities are not able even now to go at least a little way along this road. Local highway authorities do, after all, have full control over their own maintenance funds, and on trunk routes and motorways the sums allocated each year are consistent and have been up to the present on a steadily rising scale, although not rising quite as fast as many engineers would like. It should not, therefore, be difficult to draw up a forward programme, although one would have to recognize that marginal adjustments would be necessary in the light of actual funds made available.

98. In § 41 the statement is made that motorways confer great benefits on the travelling public. I would be very interested to have the Authors' views on the nature of such benefits compared with those offered by a high standard all-purpose road. A motorway has a higher initial cost. There is a need for shoulders and signalling systems (which have become increasingly sophisticated), and the decision to construct a motorway precludes design of the junctions in the most economical form, as necessarily every one has to be grade-separated and every footpath, however little used, has to be diverted or expensively bridged over a motorway. The cost benefits may not always be commensurate with the expenses incurred.

99. The Authors welcome the introduction of a rolling programme for road schemes, but at the same time have expressed doubts about the formation of the preparation pool in addition to the programming. To programme a scheme means that the sums of money which are expected to be spent on it in certain years have been estimated with reasonable accuracy, but there are difficulties in doing this when only a limited amount of preparatory work has been carried out on a scheme. At that time both estimates and design are generally known only in outline and no reliable information is available about the date upon which works are likely to start. The result is that when the design is worked up, considerable changes in the original conception are frequently found to be inevitable, and the scheme as prepared bears little resemblance to that which was programmed. A firm programme based on proposals before they have some preparation is poorly based; hence the present arrangements, whereby the scheme is only formally programmed after a certain amount of preparatory work has been carried out on it, and it has a shape, time and cost capable of reasonably accurate estimation.

100. Circumstances change over the years, and there is a danger either of abortive work or of proceeding with an out-of-date scheme if too much preparation is done too far in advance of the time works are likely to be put in hand. Although I fully agree with the Authors that a scheme should not be altered unless there is a radical change of

circumstances, there is also a virtue in not starting preparation too soon. This is perhaps one of the advantages of the current programming procedures and perhaps one of the dangers of looking too far ahead except on a broad planning basis.

Mr J. M. Smith, Lancashire County Council

The tremendous dedication shown by the team in the preparation of the Road Plan was due not only to the drive and energy of Mr Drake's leadership, but also to the team's conviction that a realistic road plan was a vital necessity for Lancashire, and that it would provide a blue-print for the tremendous volume of road and bridge works which all recognized lay ahead. Furthermore, the team entirely concurred with the plan being prepared on realistic lines, with an evaluation of the cost involved related to the monies which were considered likely to be available. This was quite unlike other development plans being prepared about that time, which took no account of the costs involved.

102. Although the plan was prepared in a remarkably short space of time, especially having regard to the fact that so much new ground was being broken, every aspect was most carefully examined and agreed before it was passed to the printers. The industry and enthusiasm of the staff in the preparation of the plan has been rewarded by the implementation of so many of the proposals in the 20 exciting years that have followed, and by the active participation which they have had in the preparation and supervision of construction of these schemes. Nevertheless, I am doubtful if the same enthusiasm could be raised at the present time, particularly by senior staff who have experienced so much frustration in getting schemes off the ground and to the construction stage.

103. One would have been justified in thinking that, particularly in Lancashire with the expertise which has been accumulated there over the past 15 years in the design and supervision of so many major motorway, trunk and classified road schemes, the administrative and procedural steps involved in getting schemes started would have diminished with the passing of the years, but in my experience the reverse is the case. I wonder whether it is really impossible for the Ministry of Transport to find some system which would result in the amount of detailed checking of proposals being related in some way to the experience and reliability of the engineers submitting them. This would reduce not only staff time but also delays.

104. As one instance of this, I suggest that the Ministry should consider raising the maximum figure which the supervising engineer is authorized to expend on any variation during the execution of contract works. The figure is at present ridiculously small for a large contract, particularly where a responsible engineer is in charge, and I submit that restrictions such as this are detrimental to the work as well as being unnecessarily time-consuming. Perhaps Mr Drake would like to comment on this.

105. He has given excellent advice to young engineers to seek a simple solution to engineering problems. I entirely agree with him in this, and with regard to bridges, which have been my particular field, I endorse the policy laid down in Chapter 10 of the Plan, viz, that bridges, particularly for motorways, should be functional and devoid of elaboration.

106. This keynote of simplicity of bridge design in Lancashire is exemplified in the motorway overbridges and underbridges, particularly on the M6, the first section of which, the Preston By-pass, was the first motorway to be built in Britain. The simple two- and four-span overbridges of steel or prestressed concrete, which were at that time prototypes, are economic and pleasing aesthetically, and their adoption has been followed generally in the subsequent motorways built in Lancashire. Only in very special circumstances has a central pier been omitted. The same keynote of simplicity in the design of bridges has been observed in areas of mining subsidence by the adoption of simply supported spans with provision for jacking of the decks.

Mr W. R. Thomson, *County Surveyor, Worcester*

It is difficult for any member of a team to be truly objective about the magnitude of its job and the value of its end product. Yet I have been away from Lancashire for 15 years, and in the meanwhile I have had my own planning and construction problems in Worcestershire, so perhaps I am well suited to make objective comments on this Paper.

108. It is important to remember that a great deal of the work of preparing the Road Plan involved quite new concepts in 1947 and 1948, or at least called for thinking about roads on a scale which was perhaps new in Britain. This makes it all the more remarkable that the Authors are able to show how substantially the resultant assumptions and conclusions have stood the test of these last 20 years. This achievement, to my mind, loses nothing from the fact that some of the statements made then look axiomatic in 1970. The point is that those responsible were to all intents and purposes pioneers in their field in Britain.

109. They were what would be regarded now as a pathetically small team, and the bulk of the work was done in the remarkably short period of about eight months. That was partly because the opposition to road proposals 20 years ago was very much less organized and sophisticated than is the case nowadays. Unfortunately, the delaying power of such opposition has now become strengthened by the way in which the statutory line-fixing processes have to work. Understandably, those who are now trying to fix new road lines must have time in which to arm themselves with good and substantial reasons why they have not favoured any of the wide range of counter-proposals which are apt to arise at a public inquiry.

110. Here there is a very serious problem. The field work necessary to obtain these answers creates alarm and despondency in wide areas quite unaffected by the more obvious line for the particular job, but to appear at all secretive about these ancillary investigations can also create suspicion and ill-will, and thus hinder the process of reaching a decision. Premature approaches are made by the public to the Ministry and a very great deal of trouble is caused at County Council level.

111. I was a member of the Lofthouse Committee which considered this matter, among others. We made many recommendations directed specifically toward simplifying the statutory processes. To our delight the then Minister of Transport accepted all of them except one on a minor matter of land acquisition, and we thought we had struck a shrewd blow. Unfortunately, not much has come of that yet. Britain is a democracy and it seems hard to simplify democratic processes. Since then, indeed, we have had the problems of the Skeffington Report to face also, and these pose their own difficulties.

112. I was much impressed by the fact that, apart from the addition of the roads shown in Fig. 2, the main variation from the plan has been an increase in the layout widths of some of the motorways. This speaks volumes for the realism with which the plan was drafted. *One interesting point which I think is not mentioned in the Paper is that Mr Drake was far-seeing enough and truculent enough to arrange that the Preston By-pass could have an extra lane added to each carriageway when that became necessary.*

113. I have always regarded the Lancashire Road Plan as a most valuable item in the library of any highway engineer, not only for its own sake but also because of its historical importance in the study of highway engineering in Britain. I feel sincerely that this Paper is a most valuable sequel to that Plan.

Mr J. V. Leigh, *County Surveyor, Hertfordshire*

I can thoroughly endorse the comments made by Messrs Smith and Thomson on the team spirit involved in the production of the Road Plan for Lancashire. The Paper is extremely enlightening and reflects the attitude of the Authors on the subjects concerned.

115. I agree with Mr Drake to a certain extent on cost-benefit analysis, but although there are dangers I would not go all the way with Mr Gaffney in his opinion that it is really not a very satisfactory implement. I am sure it has been used to great effect by the Ministry of Transport to prevent other Ministries from grabbing a higher proportion of the financial cake.

116. There was a sort of transportation survey involved prior to the making of the Road Plan. In 1946 the census that was done in Lancashire was to a certain extent directed at investigating the directions of traffic at road junctions. This gave the investigating team some information. The Authors say that if the Road Plan were to be undertaken today the amount of work involved in the transportation studies would take such an enormous amount of time that it would not be done until it was really too late. I think the Authors ought to add in the work done on the census in 1946 when they are considering the time taken.

117. This Plan was produced on a basic road layout which could be tested against what was required. This is happening in the present more sophisticated transportation studies today, but while this is going on things are not at a standstill. The roads are still being constructed according to the ideas currently held. Any transportation study must try to find out what is the best plan, and once a study is done the updating of it is a relatively simple matter.

118. During the work on the Road Plan there was quite a lot of research done, in particular Mr Ogden's work on accidents. A certain amount of research was also done on the capacity of roads. This was relatively amateur, but the figures produced in both pieces of research at that time have been shown to be very accurate indeed. Unfortunately, at that time, the general feeling in Britain was that there was not going to be very much money available and that the capacity of the roads should not be assessed in such a way as to require a large number of dual carriageways. Even at that time, however, I think we were beginning to realize that the increase of traffic would be far greater than was considered likely at that time, when an increase of 75% on the 1939 figures was being used.

119. The work done in this road plan has not only been useful for Lancashire but for Britain as a whole, and the Paper has shown it to be so.

Mr E. Ogden, Assistant County Surveyor, Traffic, Lancashire County Council

This Paper covers a wide range of subjects and I should like to confine my comments to those matters with which I am most familiar, road safety and traffic planning.

121. First, with regard to road safety, it is very difficult now to appreciate the situation in 1947. It was by no means accepted in those days that road layout and design affected the incidence of accidents. Possibly highway engineers felt that if this were true, they were in some way to blame for the continually rising figures of accidents. My study group was recruited from all branches of the profession and on that account had no inhibitions. They were prepared to deal with facts as they came up.

122. Whatever the feeling generally on the relationship between road safety and layout, certainly it had not been accepted as a science, and one of the first things was to establish a unit for measuring road safety conditions. It seems obvious now that the unit selected should be accidents per million vehicle miles. Nevertheless, this was by no means clear then.

123. We assessed the reduction in accidents obtained by building motorways. The method adopted was to measure vehicle accidents between intersections on dual carriageways, and to make allowance for the increased speed likely on a motorway. When I was at the Road Research Laboratory in 1952 I suggested that the rate on motorways when they were built would come out at about 0.4 accidents per million vehicle miles, and this has been substantiated in practice.

124. What is to be learned from this which interests engineers today? The first thing is that civil engineers are quite capable of initiating and carrying out original

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work dealing with fundamental aspects of their profession, which are capable of practical application. The second is that facilities for such work more easily exist with an organization big enough to carry it. The third is that the climate for such work is more likely to be suitable in an authority whose function is nearer to the grass roots than in one whose authority is more administrative.

125. These ideas lead naturally to the second subject with which I am concerned, namely, traffic and transportation planning. Engineers are responsible for producing highway plans and systems for a wide range of conditions, from inter-urban to conurbation. Their ability to do this has been subject to continual challenge. I personally accept that engineers must take advantage of any techniques which are available for solving their problems, but at the same time I stress that the assumptions which happen to be most convenient for the techniques must be continually probed, and the output must not be accepted unless it looks sensible. My experience has been that in road networks computer output can go wrong and unless one is studying the results closely it is possible to be misled. Some sort of simple supplementary study is needed in order to see that the output is sensible.

126. In a transportation study, a survey is made of people's movements, trips, etc., the results of which are then fed into a computer. Regression equations are obtained and theoretical calculations of trip distributions are carried out; one finds the laws that are supposed to govern the trips which can be used in the computer. Previously more direct ways were adopted by taking the movements and using them straight away, without regurgitation through a computer. This is one reason why the simpler surveys can give good results.

127. There are certain other factors which have assisted in this, even in the context of conurbations. The first is the influence of public transport. The effect of public transport is mainly in certain central areas and at certain peak times of the day. All goods vehicle movements and most other trips outside central areas are virtually independent of public transport and therefore that much easier to assess, and the simpler techniques can do it.

128. Changes in land use planning are very difficult to forecast and control, particularly those relating to population. In addition, much of the infrastructure cannot be changed by planning or any other means for many years, which means that existing land use characteristics tend to have the greatest effect on priority schemes. However, when a new land use becomes an accepted fact it is necessary to react quickly. For example, when the New Town at Skelmersdale became a valid proposition, a bridge to take the link from Skelmersdale to the motorway was included in the structural work that was being done on the M6. This was done about 10 years ago when the M6 was being designed, and the link through the bridge is just being constructed.

Mr W. G. Ascough, Southend County Borough Council

It is evident from the speakers that there is a friendly rivalry between Lancashire and Yorkshire in road construction as well as in cricket. I should like to know whether the M6 has attracted any through long-distance traffic from other major parallel north-south routes such as those in Yorkshire. Was the M6 designed to carry this traffic; or is some of it generated traffic? Can Mr Drake suggest where the generated traffic comes from? Generated traffic is nowadays an accepted part of the assessment for the future in road design, but it is not normally put as high as 25%.

130. I think the whole concept of road plans for areas of Britain is an excellent one.

Mr J. L. Paisley, Ministry of Transport

The researches by members of the team to lay down the standards of design and the various criteria that they should meet were very well done and have largely stood the

test of time. There have inevitably been improvements beyond that point but it must give all the members of the team, whether in Lancashire or now elsewhere, great pleasure to have seen the work carried through to such a satisfactory completion.

132. I was very happy to hear Mr Leigh mention his support of cost-benefit and the other more modern techniques available to us. If these techniques are available to engineers, as engineers we should not be reluctant to use them.

133. Mr Oliver was critical of the use of critical path techniques. I would agree that there is a need to fix a target, but having done that a critical path must be determined up to that date to identify the limiting factors and decide how to get round them.

134. At the time this work was done, the area of Lancashire involved was relatively confined, being the heavy industrial area between the Ribble and the Mersey, and the exercise could very largely be done manually. The same basic system was followed on a country-wide basis by Ernest Marples, when he was Minister of Transport, setting out five major projects as a basic plan for Britain—the Dover road, the road to Wales, the Birmingham road, the A1 and the Birmingham-Welsh road. Since then, perhaps somewhat slowly, due to the inevitable factors, the Ministry has been working on a national plan. This is a much more difficult exercise, almost impossible to do manually. One must take advantage of computers to establish priorities and to justify working in one area as against another. Notwithstanding what was said about the impossibility of dealing with amenities and developmental issues, one can take these into account when deriving a plan which will be valid.

135. It was said that whereas in the days of 1949 a plan could be derived relatively simply, there are now complex transportation plans. But these are very largely related to the urban areas, and deal not only with highways but the overall transport needs related to land use. This is the difference.

136. In such urban surveys, I do not think enough progress has been made. Techniques are often too elaborate, and I am hoping that it will be possible in time to produce a synthetic model for deriving the answers rather than continuing to carry on with home interview surveys, but it is a much more complex problem and does not lend itself to the sort of method that was feasible in Lancashire in 1949. There are newer techniques available, and engineers should not be backward in using them.

137. It was said that there was a lot of checking by the Ministry of proposals from other parties and that it should be prepared to take the views of experienced engineers. This is by and large what we do. If we know our engineers well enough, the discussion takes place at the working level and we are satisfied. I am, frankly, quite staggered when I see engineers come up and talk of frustration. I think the programme 15 years ago was running at £5 million/year; it is now close on £200 million/year. Surely nobody can be frustrated when dealing with sums of this size, and the annual rate of the programme is still increasing.

Sir William Harris, Ministry of Transport

Some mention has been made of public participation, and discussion with local authorities, landowners, etc. provides an easing of the way and makes everything much more simple. I would like Mr Drake to write a book some day on his experiences in the field of public participation.

139. This matter of public participation is a very difficult problem and it has been recognized at any rate by one speaker that the so-called secrecy of the Ministry has some justification. The processes we have to follow are statutory, and are laid down by law. If we did not follow them we would be challenged in the High Court and our work would be stopped at once.

Messrs Dean and Drake

In reply to Mr Roberts, it is certainly true that the M6 has assisted very materially in attracting new industries to Lancashire, and improved connexions to it—either

existing or proposed—have also helped. In Lancashire the cost-benefit in all cases has been high enough to justify the construction of the new roads, but the Ministry of Transport obviously does take into account the point made by Mr Roberts concerning the rejuvenation of existing towns: otherwise the improved access to Workington in Cumberland would never have got through their net. Many schemes in the NE must be in the same category.

141. **Mr Oliver** is quite right in mentioning the numerous meetings we have held in Lancashire to keep the public informed, and they have been of immense benefit in starting motorways on or before the appointed date—and without recriminations. The fact that both the Authors were born in Lancashire and know the county exceedingly well has assisted at these meetings.

142. With regard to Mr Oliver's point on critical paths, Lancashire's former methods (and we understand Mr Oliver continued on the same lines when he moved to the West Riding) were to have meetings in London at the Ministry of Transport when all sections of the Ministry concerned with the motorway were present. At these meetings a realistic timetable was drawn up, showing when all the parties concerned should start and complete their specific tasks, and the whole information was covered on one foolscap page. It was simple and it worked. As it would appear that critical path diagrams are here to stay the Authors would put forth the plea that they should be kept as simple as possible.

143. **Mr Gaffney**, like Mr Roberts, touches on the need for the cost-benefit analysis to include an allowance for other factors such as amenity value and benefits to a depressed area. We think the answer is to produce the cost-benefit analysis in the usual way and then stress the other factors. Senior staff at the Ministry are then able to take these points into consideration. **Mr Paisley**, in his contribution, confirmed that this is done.

144. Mr Gaffney's views regarding publicity are very similar to our own. Also we feel it is wrong to investigate routes which are quite obviously out of the question from the word go: the more routes one investigates the more people are upset and the consequences can be quite serious in the case of old persons and persons who are ill. Also the longer periods required to carry out the investigations do not help. The problems associated with disclosure or non-disclosure of new routes are very difficult ones indeed. At present there must be large numbers of house-holders living with insecurity of tenure due to the uncertainty as to whether their houses will need demolition for a new road, and so far no real solution to the problem has materialized. The difficulties are particularly acute at the preparation pool stage.

145. **Mr Best's** hope that the nerves, mental ease and physical health of Lancastrians have been improved by the money spent on roads in Lancashire has been realized. For those who formerly had to travel along the A49 through Warrington, Wigan and Preston, the construction of the M6 has been a godsend, and the appreciable savings in road casualties has, at the same time, helped the hospitals.

146. We believe that Mr Best is probably right in thinking that 30 years is too far ahead to plan nowadays. In 1949 it was different because very little major road work was allowed in the first ten years. It is expected that the increase in traffic will tail off very appreciably in 20 years' time. We agree with him that it would be advantageous if highway authorities were able to draw up a realistic maintenance progress plan looking several years ahead, but unfortunately, with maintenance funds being so limited, it is just impossible. For example, the funds allowed for the maintenance of 207 miles of trunk roads in Lancashire for which the county acts as Agent only provided for 1·10 miles of resurfacing in 1968/69 and none in 1969/70.

147. Lack of space prevents more than an outline of all the advantages of motorways over all-purpose roads, but it is admitted that the higher standards of hard shoulders and increasingly sophisticated signalling systems are now widening the cost between the two types of road. In the Authors' opinion the Ministry should consider the adoption of two types of motorway, one being the major motorways

incorporating all the present features, and the other omitting some of the more costly features. However, both types should be definitely motorway, with two-grade intersections and no footpaths but possibly somewhat narrower hard shoulders on the second type. In addition to the all-important safety factor of the two-level intersection there is the additional advantage that it allows free access between the areas on either side of the road.

148. We prefer rolling programmes to the present preparation pool because the staff concerned have a definite date to work to. Should a scheme fall by the wayside, it is just too bad; with sensible programming these schemes would be few and far between. We feel that too much 'lip service' is being paid to staff involvement in all walks of life and not enough put into practice.

149. We appreciate **Mr Smith's** point of view regarding the delays. To have a fully experienced staff working long hours to get the work out on time and then have to await a very meticulous checking of the contract documents is frustrating, and we wonder whether it would not be possible for the Ministry to have a grading scheme somewhat on the lines that motor organizations have worked out for hotels and restaurants.

150. **Mr Smith**, of course, is quite right in saying that the maximum figure which the superintending Engineer is authorized to expend on any variation scheme, viz. £2000, is ridiculously small on a large contract of many millions of pounds. The figures should bear some relationship to the size of the job.

151. **Mr Thomson** also touches on the alarm and despondency over wide areas during the preparation of the scheme. We certainly agree that this should not be allowed if there is an obvious route for the road.

152. With regard to his point that the Preston By-pass was planned wide enough to allow for an extra lane later, it is of interest to mention that, with the much increased width of centre verge which provided for it, there was no fatal accident in its first five years. The Authors are in favour of wider central verges, due regard being paid to the availability of land, and certainly feel that if there is doubt about the necessity or otherwise of an extra lane the centre verge should be made wide enough to allow it to be constructed when required.

153. **Mr Leigh** obviously favours transportation studies much more than we do. We must emphasize that we are not opposed to them. What we do not agree with is to make them so complicated that they take six years or more to complete. He is quite right in saying that we did take a census of traffic in Lancashire in 1946. What we did was to arrange for the roadmen to take a census at each major junction. Fortunately we were not aware at the time that we should have received Ministry approval for it.

154. We look upon **Mr Ogden**, with his experience of over 21 years, as one of the finest traffic engineers in Britain; he was greatly missed when he had to spend up to two days a week on assisting in these very lengthy transportation studies. The studies have shown that changes in land use have had little effect on the road proposals and that so long as proposals can be quickly changed as in the case of the link to the new town of Skelmersdale, there is little harm in adopting land-use patterns as at present envisaged.

155. With regard to **Mr Ascough's** query as to where generated traffic comes from, when traffic assessments are made it is practice to include a factor for generated traffic (as distinct from traffic attracted from other more or less parallel routes) and it has been found that in the event this generated traffic is considerably higher than was allowed for formerly. One possible reason for this is that roads of very high standard invite motorists to make journeys which previously they might not have made or might have made by other means. As to the M6 attracting traffic from N-S routes through Yorkshire, it will certainly do so when the link between the M6 and M1 is completed, and during 1971 when the M6 is open as far as the Scottish border. On the other hand, the annual increase in traffic will replace the traffic lost by Yorkshire.

DISCUSSION

The generated traffic is probably higher in Lancashire than in most other areas because a very high percentage of existing roads is subject to a 30 mile/h speed limit. In some cases motorways have cut down journey times by more than 66 $\frac{2}{3}$ %.

156. We are pleased that **Mr Paisley** took part in the discussion, as he was the Divisional Road Engineer in the north-west for many years prior to moving to London. He appears to agree with us, even if only to a small extent, when he mentions the present techniques are often too elaborate. He is right, of course, that urban road planning is a much more complicated problem than that in rural areas. On the other hand a thorough knowledge of the area can save an enormous amount of time, e.g. one of the Authors thought out the South Lancashire Motorway while lying awake in a Chicago Hotel ten years ago. It later got him into trouble, but extensive advanced works are now in progress.

157. We would also like to thank **Sir William Harris** for his very complimentary remarks and for touching on the matter of public participation. In the case of Lancashire our methods have worked very successfully over a period now amounting to more than 15 years, but we can see that it might not be as successful if similar methods were used in the densely built-up areas in London.