Edinburgh School of Town and Country Planning. Landscape Essay 1968

T. M. Pharoah

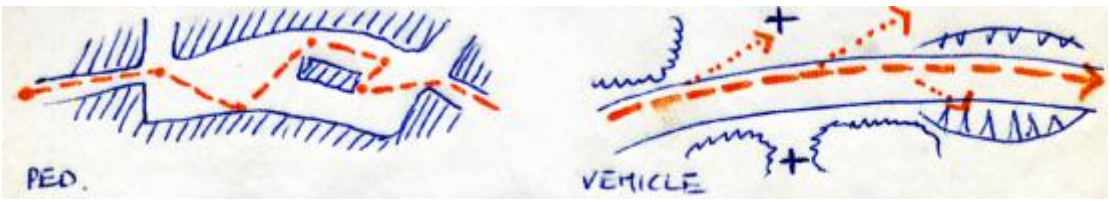
“THE LANDSCAPE OF HIGHWAYS”

With continually increasing mobility, particularly by the use of motor vehicles, the highway is becoming a very significant part of our environment. Not only are roads and vehicles rapidly increasing, but the proportion of each person’s time spent on highways is increasing, as our mode of living adjusts to maximum mobility. For many people already commuting time may account for up to 10% of the waking day, whilst driving for recreational purposes is becoming a normal weekend pastime for most families. It therefore seems logical to pay careful regard to the appearance of our highways so that driving may be more than just a rather boring task, more than an unavoidable disadvantage of decentralised living.

Whilst I cannot in this essay go into the relative merits of centralised and decentralised living, it is clear that the motor car has made possible a very large choice of home locations, and this freedom of choice cannot easily be restricted.

Apart from the increasing amount of time spent on roads, it is important to realise that they are the principle paths from which we observe our general environment. This means that the visual quality of a road is governed not only by its actual design, but also by the may in which it allows as to recognise and comprehend the environment through which it passes. The need for such environmental imageability is fundamental and is of wide emotional and practical importance. Studies by Kevin Lynch have shown that tension and disorientation result when the wider environment is not visible, such as when the road is in a deep cutting for any great length.

In approaching the design of highways the characteristics of travel must first be understood. Unlike a path for pedestrian use, where the observer is able to explore his surroundings and make contact with its elements, the highway forms a more or less predetermined path which must be followed, and at a speed where much detail is lost to the observer.



There are other major differences too. The automobile acts as a kind of filter between the driver and his environment. He is deprived of much of the sensual feel of environment such as experiences of smell, temperature, wind, dampness, surface texture and so on. Driving replaces these with the experience of speed and a gliding movement, and sometimes a feeling of power over the environment. But this kind of driving experience is more or

less constant: whenever one drives one has the same sensual experience as the time before, therefore in order to bring variety and pleasure into driving, great reliance has to be made on the visual aspect...the view from the road.

Even in this respect driving provides limited experience, for when driving, the field of vision is restricted and out of necessity is closely related to the actual path of the vehicle. However, this may be of some advantage in the task or shaping the highway environment, for it is possible to determine certain areas which are of principle visual importance to any given road.

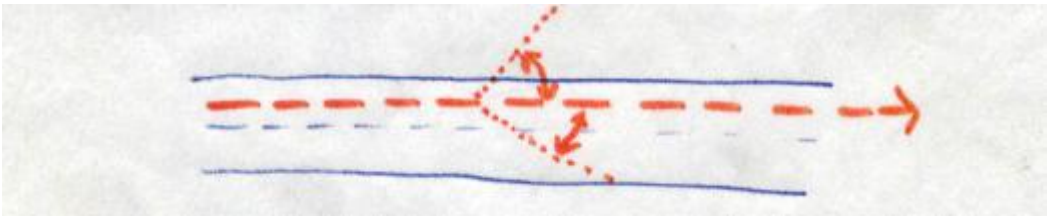
But roads are not homogeneous in character and it is necessary to analyse each type of road before the formulation of any design criteria can begin. Generalisations may lead to oversimplification, but at the risk of this eight categories may be listed:

Rural Motorway	Inter urban
Rural Main Road	
Rural By-Roads	
Recreation Road	
Urban Motorway	Intra urban
Main Town Road	
Distributor Roads	
Local Access Road	

For this essay I shall restrict myself to the first two categories, as these pose more problems and have more potential from the pure landscape design point of view. The principal characteristics of these roads, as will affect design criteria, are those of speed, type and function, although these are closely related. The importance of recognising a road's characteristics lies in the fact that they greatly influence the perception of the driver. I shall attempt to point out some of the major variables concerning perception.

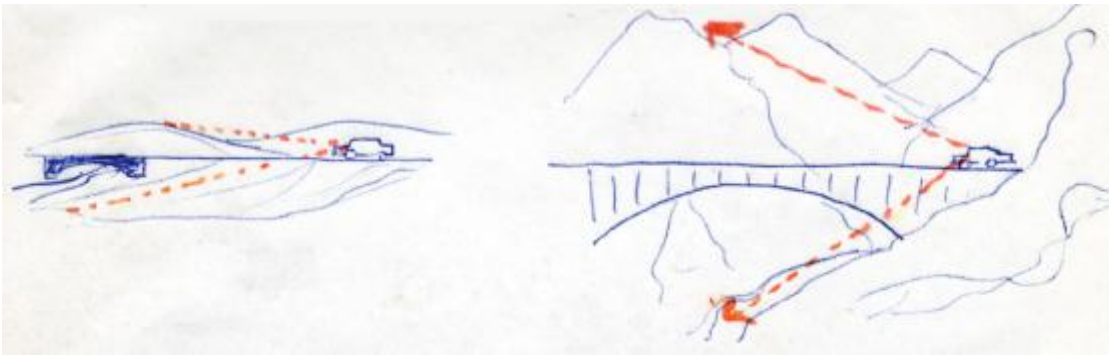
The driver's angle of vision is perhaps the most important single factor and there are several points to note.

First, the total angle of vision is not, as is often thought, equally disposed about the line of travel.

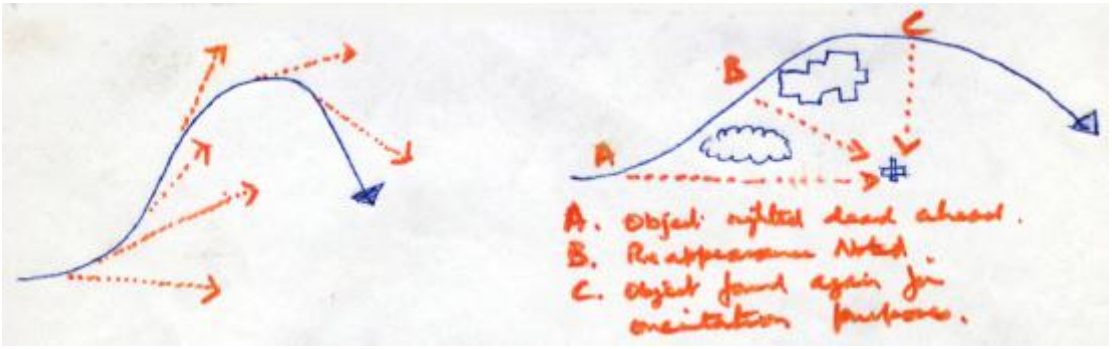


There are several reasons for this: The wide expanse of road surface on the opposite side of the road is generally unattractive to the eye; oncoming traffic also makes it uncomfortable to look to the right; and the windscreen edge provides a definite frame to the view.

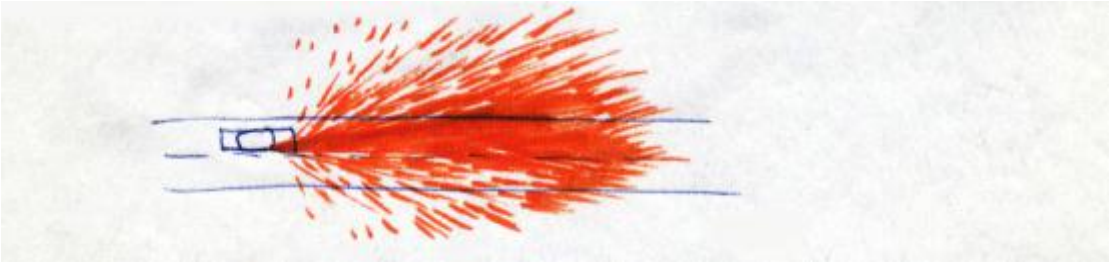
Second, the vertical field of vision, though still important is less critical. It is rare that the driver's view cannot embrace everything in the vertical field, at least on inter-urban roads. The main exception to this is in areas of extreme topographical change.



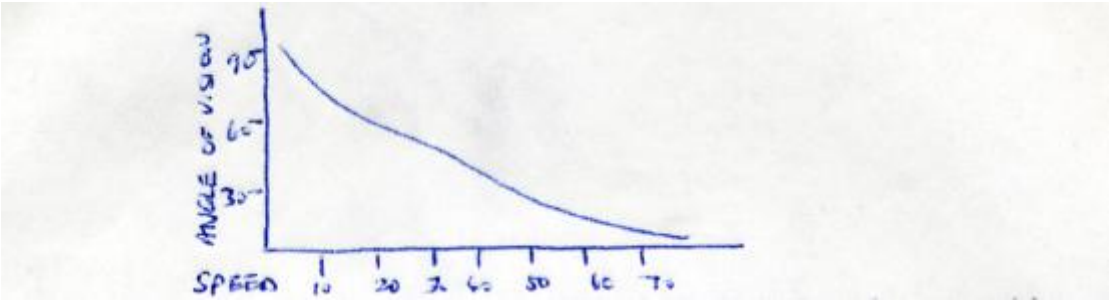
Third, the objects most often sighted are those closest to the dead ahead position (particularly road signs). A landmark object once seen dead ahead may be sought after again even if this involves an extreme viewing angle because of an awareness of its presence.



Fourth, as the angle of vision increases so the number of object sightings diminishes and becomes more sporadic.



Fifth, it has been found that as the speed of travel increases, the angle of vision (i.e. perception) decreases and also that the number of objects sighted decreases and attention is focussed more on the road itself. This latter factor also applies when the road becomes difficult to negotiate, whether by reason of heavy traffic or other driving hazards.

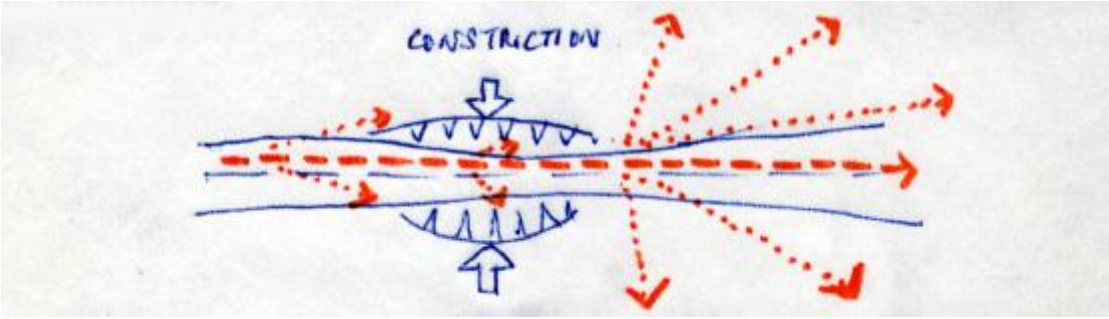


To illustrate how trip purpose may influence speed and perception we can compare a commuter (to work), someone visiting a friend, and someone driving purely for pleasure. A commuter will be most concerned with completing the journey as quickly as possible and will be looking for features by which he can more mark his or her progress. The person visiting will probably have more time to spare and will be willing to notice more of the highway's environment. The pleasure driver will naturally be the most receptive of all.

This has brought us to the influence of purely psychological factors on the nature of perception, which although very often of a subjective nature are extremely important. A few points will serve to illustrate this. Where constriction occurs on either side of the road by reason of a cutting or belts of trees, attention will be confined by these features to the road ahead. When the constriction ends the angle of vision will suddenly widen out to the full limits of the vista. This phenomenon may occur because of a desire for reorientation or perhaps merely for the sake of curiosity.

If there is no constriction, and there is a fairly open landscape, the various features will be competing for the eyes' attention. Whether a particular object is noticed or not will depend not just on its prominence or its relation to the

road but also on the kind of person driving, his interests and his needs. The sighting of on object can even depend on its ability to convey an idea. For example, if the driver is feeling hungry, he may notice cafés in preference to other features; or if he is approaching a town he knows he will instinctively pick out a familiar landmark.



It is thus important to realise that there can never be a set pattern of perception for any given stretch or road. The perception of an environment varies greatly from person to person and even from journey to journey by the same person.

This factor makes generalisations about the type of environment that should be created very difficult, yet attempts should be made to discover the various features that are recognised by the majority in order that an objective approach to design can be taken. The purpose of on objective approach is to create an environment with “planned perception”. This brings three major advantages to the driving experience.

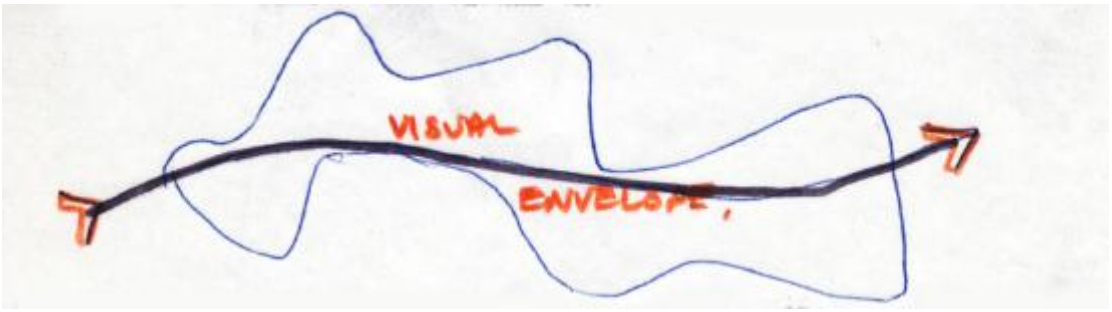
1. First, interest in the environment can be created, so relieving the monotony of driving and thus aiding safety.
2. Second, a planned design can make driving a positive experience rather than a dull task to be put up with.
3. Third, good highway design can help a driver to "read" the road and so make it easier to locate himself. This will lessen his reliance on road signs and help to bring a comprehensible scale to the road - a feature so often lacking on our motorways.

Towards Design Criteria

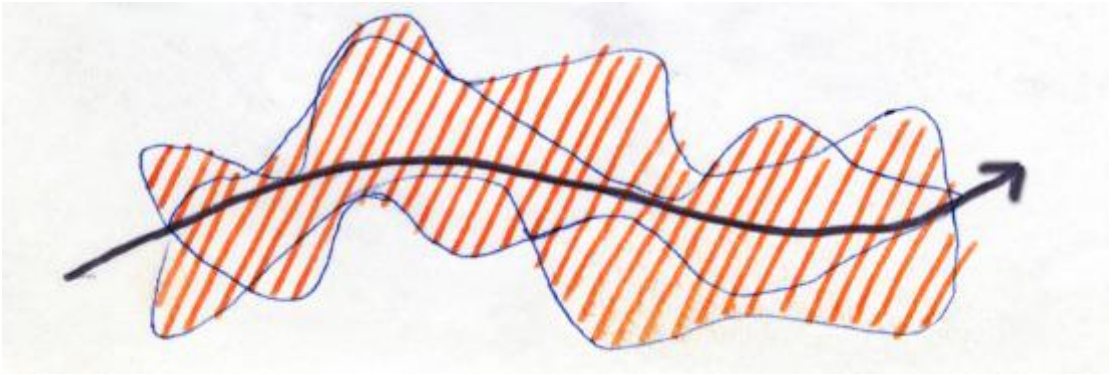
The basic requirements of highway design are, first, to make the highway successful from both the functional and aesthetic viewpoints and, second, to achieve a unity and harmony between the highway and the landscape through which it passes. The view <u>of</u> the road is as important as the view <u>from</u> the road. It is interesting that the studies so far undertaken have neglected consideration of the highway in its setting.

Whether a design scheme is being considered for an existing road or a new road, a survey must be carried out to analyse the area falling within the road’s influence. The first step should be to define the area which can be seen from the road. The driver’s field of vision is of key importance here also. For all high-speed roads angles of 50 and 35 degrees (approximately) should be

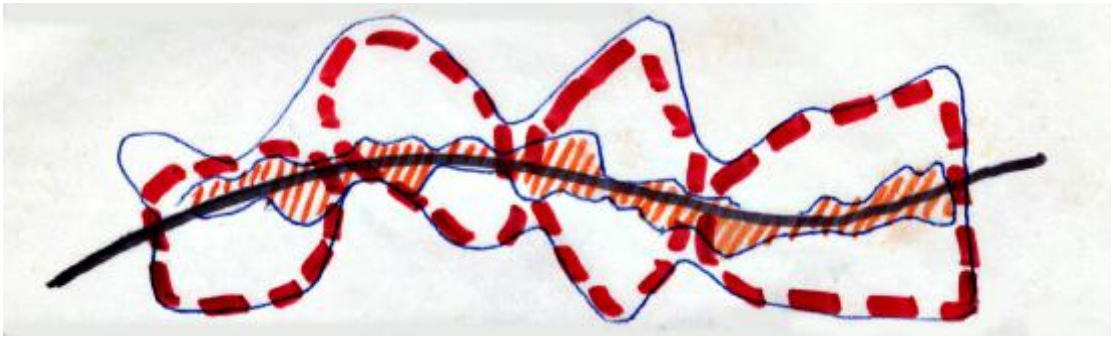
taken to the left and right (in the UK) of the line of travel respectively, and areas falling within this field of view should be plotted on a contour map. The area so formed may be called the “visual envelope” of the road.



Views generally need not exceed two or three miles as visibility beyond this distance is usually insignificant. In fact the visual envelope may be of most use if it is restricted to about one and a half miles, which is the distance at which individual objects become indistinct. A visual envelope map should be constructed for both directions of travel and the two can then be combined.



Within this general envelope, smaller areas can usually be defined by various visual boundaries which contain outward views for most of the time. It will be in these areas closer to the road that the most potential will exist for economic landscape improvement.



From these two maps identity areas may be found, which ere defined by various constriction points along the route. These “identity areas” may or may not have distinguishing characteristics, but attempts should be made to analyse their individuality.

The next step in the survey will be to locate all the relevant features falling within the visual envelope. This will include natural features such as woodland, rivers, types of flora, hills, valleys and other features such as land use (type of agriculture etc.), quarries, houses and landmarks. Each feature must be recorded impartially and judgment of whether it is positive or negative left until the actual design stage. Recording of this information may be done using maps, photographs and movies.

On roads which are already built, surveys and interviews should be carried out with actual drivers, who can record on tape what they see as they drive along - not only what they notice but also their impressions. At the end of the journey they should be asked to recall what they have seen. This “recall response” information can throw a good deal of light on the way people respond to a road.

When such a survey is conducted using a sample of, say, 40 people with differing backgrounds in terms of education, social class and occupation a very useful picture can be drawn up of which objects were sighted most frequently, and which objects made the most impact on the drivers. Analysis of the results should be aimed at finding common elements in perception response in order to discover what, if any, “public image” may be held of the road. Also, correlation between the type of road, speed travelled and the number and location of objects sighted can be noted. In a recent survey carried out along these lines in Connecticut, U.S.A. it was soon found that object sightings increased as the travel speed dropped, and also the angle of vision increased with a reduction in speed. It was also found that there was a great response to any open vistas, such as the sudden view of a valley or a bay.

By carrying out such survey work, many factors will emerge for each length of road which will form the major basis for design consideration. It should also be possible to ascertain faults in the design of a highway from the aesthetic and functional viewpoints. It is worth considering the statement that the functional requirements of the view from the road are more important then the purely aesthetic. When investing in landscape improvement work, economy is important and therefore the more objective the approach to design the better.

Purely aesthetic governors in the design process are almost certain to contain a lot of subjectivity, with the result that what too designer conceived as beautiful the people using the road may find unexciting, or they may not even notice the feature. But by functional governors of design, I do not simply mean the engineering requirements such as screening for the prevention of frost, wind etc. Functional design should include the imageability of a road, the ease with which a driver can orientate himself, mark his progression and so on.

Landscape design

It is vital that any design scheme for a highway should strengthen the individuality of the road in question. No one design idea can be universally

applied to all roads. Instead I shall describe a few design ideas which may be used to overcome problems or shortcomings on existing highways.

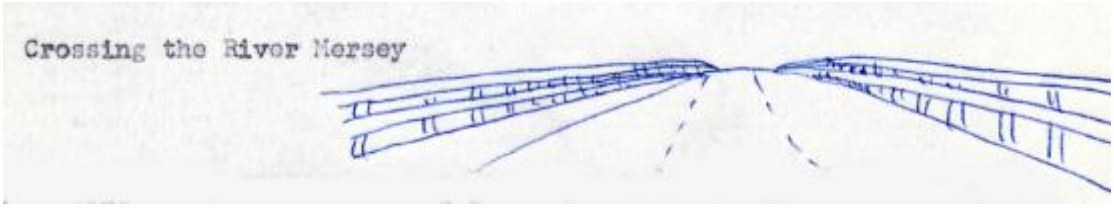
Perhaps the most common feature of our motorways is the lack of a clear identification with the country through which they pass. Very often the only clue to the driver of his whereabouts is the exit sign on the road itself; rivers, roads and railways are crossed blindly; woodland areas are obliterated by the wide path cut for the highway and so on.

All this adds up to a driving experience which is often monotonous and less exciting than it could be. There are good examples of road design providing excellent experience, but these too often occur by chance.

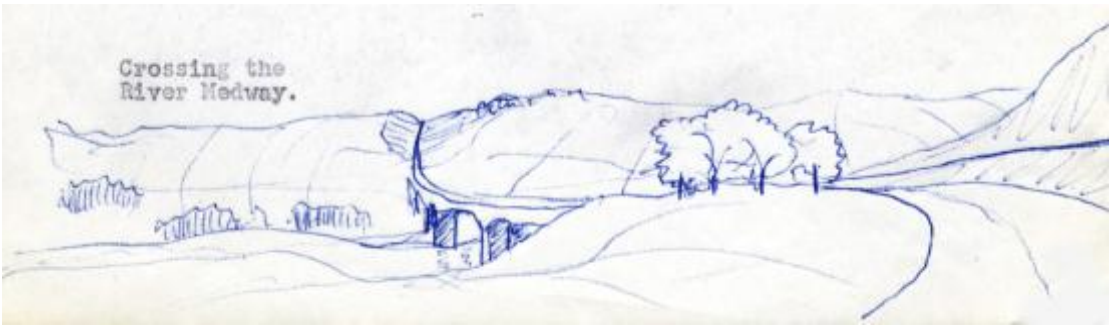
River crossings

A river crossing can be a pleasant visual experience and can also provide an important landmark for a motorway. For illustration, I take the crossing of the river Mersey by the M6, and the crossing of the Medway by the M2.

The Mersey crossing is barely a relief from the monotony which the M6 Provides in this area. The river is approached head-on and the road rises gradually over it on a long bridge. As a result of the alignment of the road and the design of the crash barriers, the river is barely visible.

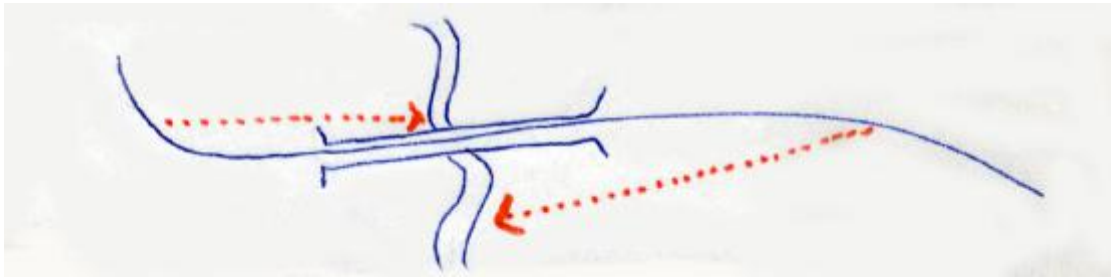


In contrast the M2 approaches the Meadway on a downhill and curving path, thus opening to view not only the river but also the road bridge itself.



Obviously in the case of the Medway crossing, topography was a tremendous advantage, but the site was exploited positively to enhance the visual result. Trees were cleared to open up the vista of the river valley and the two carriageways were set at different levels which reduces the distraction of the traffic itself. Also the curving road set into the hillside has made the road at once a part of the total landscape.

The Mersey crossing would have been better if the bridge approach had been set on a curve. This would have provided the driver with a view of the river and the bridge and so increased awareness of the location.



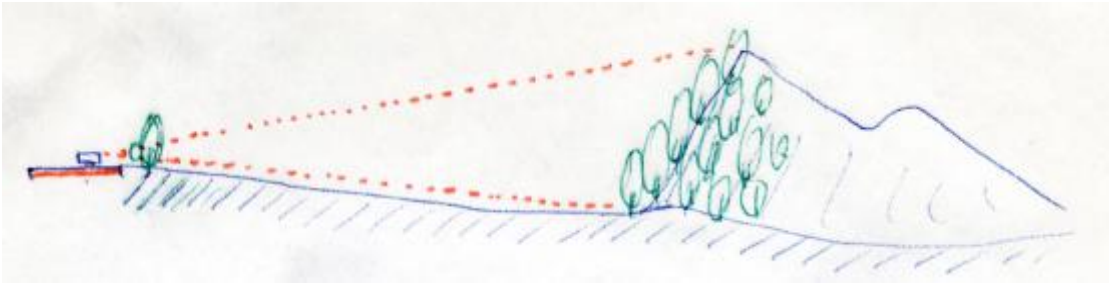
Orientation and Location

The awareness of location, as previously pointed out, has important practical and psychological value. Therefore attempts should always be made to bring the road into contact with its surroundings. Vistas can be made to identifiable features within the landscape, such as church towers, forests or large factories. For example, the appearance by the road near Coventry of a car factory is interesting because it provides a link between the road and the place through which it is passing. For the same reason, a road through Buckinghamshire should at least be well provided with views of acres of beech trees. But links are also possible and desirable at a more local scale. For example, when approaching a town or city, the districts alongside the road should be identifiable so that the driver knows when he is nearing his destination.

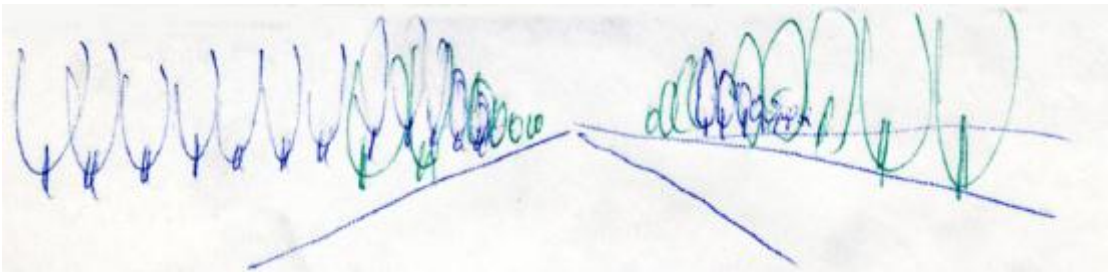
Such design problems are concerned with re-introducing the human scale to the highway, to overcome the feeling a driver experiences of being shut off from the world and to combat the boredom that results from an uneventful drive. Kevin Lynch in his book “View from The Road” (Appleyard, D., Lynch, K. & Myer, J.R., 1964. *The View from the Road*, Cambridge, MA: MIT Press for the Joint Center for Urban Studies of M.I.T. and Harvard University) has constructed an imaginary approach to a city and shows how the use of topography, gradient and landscaping can make entering a city a logical progression of visual experiences without loss of interest, purpose or orientation.

Planting and earthworks

This kind of approach is best suited to areas close to the highway, and especially those areas of extreme visual influence (which may be called pressure points). In these areas landscape work can influence the whole highway environment with relatively little expense. For example, a rash of slag-heaps or pit workings at a distance of, say, a ¼ mile from the road may be screened effectively by a small belt of trees and shrubs alongside the road, whereas an enormous amount of planting would be required to screen the eyesore itself.



Perhaps the most important aspect of landscape treatment from the visual point of view is for softening the effects of a major highway cutting through the countryside. For example, on the M2 near Faversham in Kent, the road cuts through a well-established shelter-belt of poplar trees at an oblique angle. This disturbs the eye and the road appears an intruder into the landscape. Such a scar may easily be remedied by the planting of a few more trees where the road passes the shelter-belt.



In the landscape design of a highway, the psychological factors of perception should not be ignored. The landscaping should make it easier, as well as more pleasant, for the driver to negotiate the road. Two examples will serve to illustrate this point.

First, a situation may occur where an old road is visible from the motorway peeling off in another direction. Confusion as to which way the road is going may easily occur, especially at night. Planting can screen the old road from View and so remove the confusion. (See diagram next page)

Second when approaching a road intersection, driver must keep all his attention on the road, and therefore his view of the wider environment should be restricted at these points. An opening vista immediately before an intersection can prove distracting, and therefore dangerous. A good example of such a limiting of vision occurs at the south end of the Doncaster bypass, where an important roundabout intersection is completely enclosed by coniferous trees. This enclosure has the effect of concentrating attention on the road, and also provides an excellent backcloth for the large direction signs.

Such ordering of the driver's vision can greatly add to driving comfort and safety as well as create a driving experience which is orderly and coherent, rather than disturbing or chaotic.

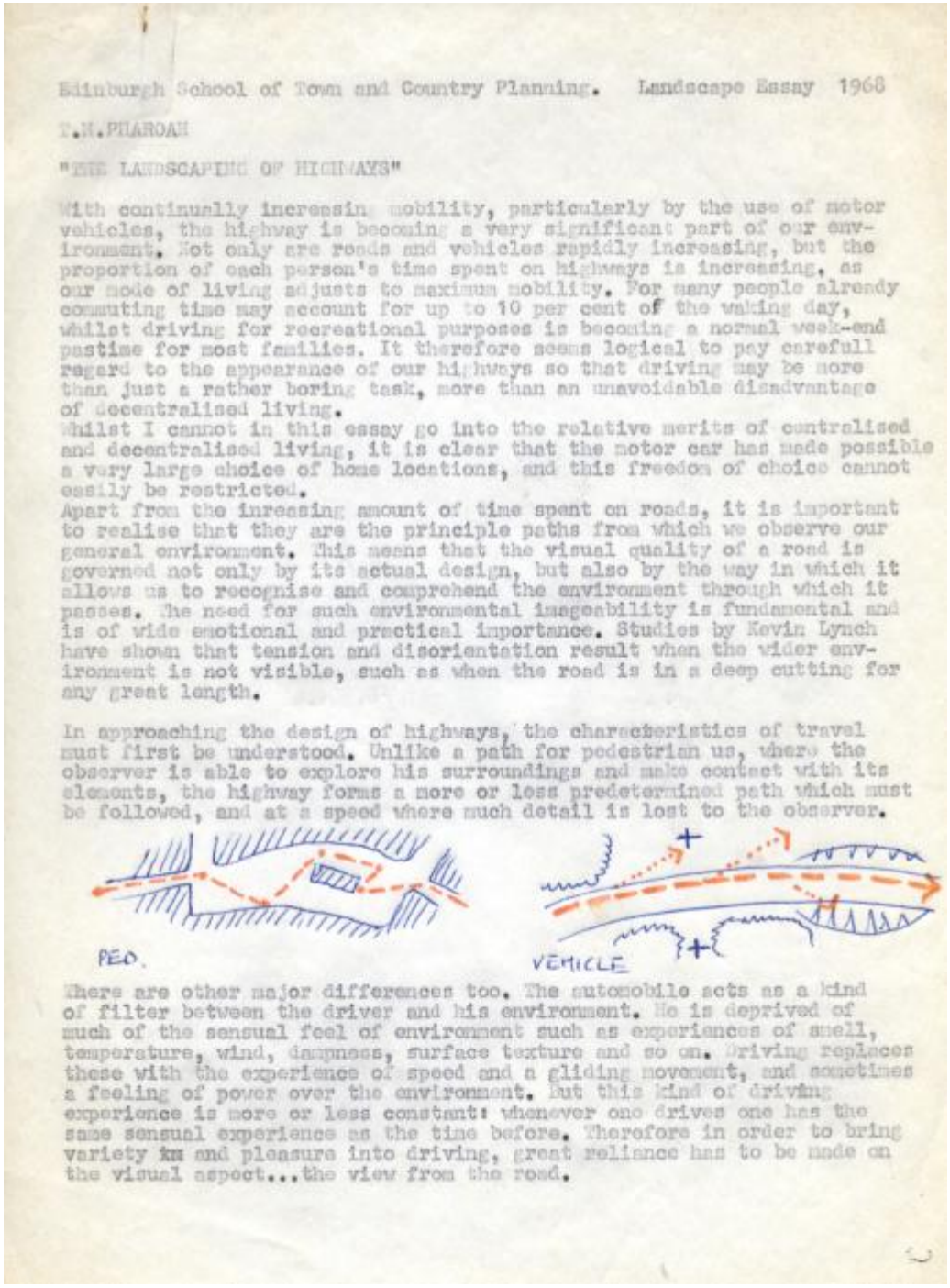
Conclusion

The most fundamental principle in highway landscape design is constantly to bear in mind the varying context of the environment, the road and the driver, and then a design can be formulated which will be an expression of both function and beauty.

Timothy M. Pharoah
August 1968

Below is a scan of page 1 of the carbon typewritten document, found at the bottom of a drawer. The text is not clear, hence the need to re-present it, but the sketches are scanned from the original.

The essay was based on work by the author at Yale University, Art and Architecture Department, in 1968 on a project entitled “Highway as Environment”. A copy can still be found in the Yale library. The work included analysis of human responses in a driving simulator.



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