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Cutting CO$_2$ Emissions through Optimising Infrastructure Use

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REDUCING CO$_2$ EMISSIONS BY IMPROVING OUR USE OF INFRASTRUCTURE

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The topic necessarily demands an in-depth analysis of developments in mobility and transport organisation, since we can only achieve our stated objective by reviewing the operation of the institutions set up to regulate the transport system, if only to reap the benefit from technological advances which will not, however, provide all the answers. Policies based on attempts to change the way people use their vehicles by imposing constraints or centralised price controls designed to internalise the external costs of vehicle use are not credible responses to the problem.

Something else that has to be made clear before we start is that there is no global solution to this problem. Any response must necessarily involve a whole range of measures and actions: as is often the case when we seek to evolve a complex system, a multidisciplinary treatment is the only cure.

We shall be developing our theme in three stages:

1) Identifying and quantifying the spatial and territorial parameters served by the infrastructure

We have to distinguish between the local infrastructure used by commuters which are more often obligatory than journeys for pleasure, and the junction infrastructure used on more occasional journeys and serving the needs of an increasingly mobile population as well as an economic purpose. Urban sprawl is a major source of increased CO$_2$ emission. However per capita CO$_2$ emission varies enormously from country to country (from 6 tonnes in the USA to 2.4 tonnes in France, Germany and Britain and under 2 tonnes in Italy). That difference reflects the connection between development, infrastructure and the use of infrastructure and its primary causes are to be sought in population density and the morphology of urban and residential centres.

2) Assessing the degree of flexibility in use of infrastructure that can be achieved by modifying road-use behaviour or by development planning.

While few disagree with the theory of optimum road use charges, in practice it is fairly useless, offering no more than the illusion of a solution. Modal transport will only be achieved if it is based on a non-modal approach which emphasises the concept of movement. The computerisation of intermodal solutions and economies of scale now look like more helpful approaches, hence the current emphasis on the possible application of new computer technologies and the search for new types of organisation which are based on the assumption of constantly moving concentrations and flows of long distance transport. Routing plans and dedicated networks are the avenues we need to explore.
3) That being the case, what are the chances of any reduction in CO₂ emissions?

Most of the scenarios on offer today suggest that given current trends, there is no chance at all, even taking into account new developments in exhaust emission control.

It will be hard to reverse the general trend simply by modifying the behaviour of individual road users in the hope of finding solutions in the short or medium term.

There can be no real solution unless a way is found to modify the operating mode adopted by the institutions whose job it is to clarify the rules of the game, establish an organisational hierarchy and force all the players to shoulder their responsibilities. France's PDUs (Urban Transport Plans) constitute an example of how to introduce "dedicated freight networks" which in France presumes a reorganisation of the railways. Even so, the effects are hard to quantify. ACEA has made a significant commitment which, if it works, will offset any increase in CO₂ emissions. Even so any reduction in CO₂ emissions can only be technology-based. Government regulations must be backed up by economic management and prepare the ground for territorial management.

In developing these themes we shall be making use of several recent surveys which compare CO₂ emissions in various major cities around the world and relate those figures to the morphology and population density of the cities concerned. All those studies go on to project emission trends in relation to infrastructure use (a combination of traffic projection and emission models: SEA for TEN pilot) or identify the conditions required if the link between transport and development is to be broken, so that exhaust emissions can be reduced.