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# Transport investment and local and regional development: Perspectives on the emerging motorway system in Poland

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**38TH CONGRESS OF THE  
EUROPEAN REGIONAL SCIENCE ASSOCIATION**

**“Europe quo vadis? - Regional Questions at the Turn of the Century”**

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**“Transport Investment and Local and Regional Development:  
Perspectives on the Emerging Motorway System in Poland”**

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**Abstract:** The planned Polish motorway programme is widely expected to have beneficial spinoff effects on local and regional economies within Poland, and on the economy as a whole. Similar arguments were employed during the development of the British interurban road system (and other West European systems). The paper examines the likely relevance of such arguments in the development of the Polish system. The results of current research in the UK are related to the planning and implementation of the Polish motorway network. The topic of the paper has started to assume particular importance in Poland as it becomes more obvious that the projected levels of interurban traffic within and through Poland are likely to be insufficient to finance more than limited sections of the proposed toll motorways. Pressure is building up in Poland for greater governmental support for the network, and possible "non traffic" justifications for construction have begun to assume greater importance. The situation is particularly controversial as environmental lobbies are vocal in opposing motorway developments. The paper considers the extent to which current research supports, in the Polish context, the employment of such economic development arguments.

## **Introduction**

The provision of good quality infrastructure is frequently cited as a crucial factor in local and regional development, providing the right conditions for the growth of new business and the attraction of firms to depressed areas. Commercial lobbies and local authorities and organisations in particular stress the need for good transport infrastructure, especially roads, in making areas attractive for new investment. In the case of Eastern and Central Europe, the European Union has placed great emphasis on defining a TransEuropean Route Network which integrates the main road network of this region with Western Europe by defining a network of high quality motorways, or autostrada. However, traffic forecasts often suggest it may take rather longer than anticipated for traffic volumes to rise high enough to meet the required returns on investment. Demands for greater financial participation by host governments to make possible earlier starts on key routes put greater emphasis on non-traffic justifications for construction.

This paper looks at the particular situation of the Polish motorway network. This occupies a key role in the extension of motorway networks east from the European Union on account of its key strategic location. The paper will review firstly the theoretical and empirical evidence from current evaluations in the UK, where there has been a return to the issues surrounding the potential impact of transport infrastructure on local and regional economic development. The paper will then review the situation in Poland, and current progress on the development of its motorway network. It will then consider how the most recent research applies to the country as a whole, and to particular parts of it. This will be compared to some of the evidence emerging on local expectations of benefit from being linked to the motorway system. The paper is based on work in progress.

## **Theoretical and Empirical Evidence**

The issue of the relationship between transport investment and local and regional development is a long standing research area. In an era of concern with sustainable development, pressure to reduce the global environmental impact of transport meets the counter argument that if expenditure is cut back on support to transport investment it will harm economic growth and job creation, and impact on local and regional development. While this is currently a key question on the policy agenda in the UK, it is not just a UK question. The conflict exists at a general European level. Within the

European Union, the commitment to a sustainable mobility policy is at odds with pressures to invest in transport infrastructure based on arguments about jobs and economic growth. In Eastern Europe environmental pressure groups argue strongly against proposals for heavy investments in motorway systems, even where the economic growth and jobs argument seems more urgent. In the UK, there is a political pressure to give a clear and unequivocal answer to this question. Currently, the Standing Advisory Committee on Trunk Road Appraisal is examining this issue, and its Interim Report is referred to at the end of this section. The section as a whole will consider research which derives largely from a UK and West European context. It will of course be a matter for subsequent discussion to consider how this research applies to Eastern Europe, and Poland in particular.

The need to make arguments about, or to understand the evidence on transport/local and regional development issues may arise from different angles. One may be simple project appraisal issues. Standardised cost-benefit procedures focus on the direct transport benefits of an investment. The argument is then raised that such procedures do not take account of indirect benefits: new roads, for instance, may be said to encourage the longer term restructuring of the economy, and the standard cost-benefit procedure ignores this. Hence, the interest here arises from general procedural needs, to assess if the outputs of appraisals need to be weighted in some way to reflect uncounted developmental benefits. An alternative need for evidence may arise from issues around regional planning, and assessments of strategies which will boost a lagging region, or else avoid bottlenecks which may hold back development in a growing region. The justification of transport infrastructure in an overall development strategy may relate to either of these. The question is not so much the aggregate return on the investment, but its distribution.

Assessing claims about the effects of transport investment on local and regional development is problematic. Several difficulties facing researchers in this area. An initial difficulty is that major transport investments take a long time to plan and construct and have effects which extend from well before completion to a long time after. Hence, the effects being monitored may emerge slowly in a diffused way, being overshadowed and smothered by other factors of greater and more immediate impact. More specifically, reality with the investment completed should ideally be compared with what reality would have been without the investment (the "counterfactual", as Botham (1983) describes it). This is to avoid the "post hoc, ergo propter hoc" fallacy ("it happened after it was built, so it must be because of it"). But saying what might have happened without the investment is

difficult. There could be several possible alternative futures. Also, effects are diffused not only in time, but in space, and within one another.

At a national level in a country such as the UK with well developed transport infrastructures, where even major investments are marginal additions to the total stock, the problem of distinguishing transport's contribution to overall economic growth is difficult, especially where there is uncertainty in general about the underlying causes of economic growth in general. The key question is then whether there is any reason to believe that an investment appraisal does not measure the return to the economy of a transport investment. Theoretical analysis (e.g. Gwilliam, 1970, Dodgson, 1973) until recent years (more recent research is reviewed below) suggested that a normal economic evaluation of a transport project will provide a reasonable reflection of its worth to an advanced economy with an already well-developed transport infrastructure. In a situation where empirical analysis is difficult, this conclusion will suffice where most of our practical interest is focused at a more disaggregate and sub-national level. In fact, most of the research carried out so far has focused on the impact of transport investment on the interregional distribution of development.

Transport investment as a way of reducing regional disadvantage is an uncertain policy tool. If a depressed region's industries are weak, then making a region more accessible may open it up to even more competition and make it worse off than it was before. In the UK the main cause of regional problems seems more likely to have been outdated economic structures rather than poor accessibility. Whether improved communication makes depressed regions more attractive to locate in is also open to question. Studies of industrial transport costs suggest that transport costs are only a small proportion of total costs (PIEDA (1984) suggests 2-4% of gross output value, and Diamond and Spence (1987) 6.6% of operating costs), and moreover that interregional variations in transport costs are not great (even in 1963 with few motorways, Edwards, (1975, p.125) cited interregional cost no more than 2-3 per cent of the value added for manufacturing, while Chisholm (1987) says 1963 and 1974 transport expenditure by Scottish manufacturing firms was almost identical to the national average). These findings seem strange compared to the prominence given to transport costs in theoretical literature on industrial location. Tyler and Kitson (1987) observe that they also seem “out of place with the emphasis by government on transport policies, used to stimulate economic development in peripheral areas through the improvement of accessibility and lower transport costs” (p.63). Even official studies of industrial location behaviour (e.g. Department of

Industry, 1973) suggest that transport factors are not the most important in firms' location decisions at an interregional level, though they assume greater importance at the intraregional level. Moreover, Diamond and Spence (1989) say, significantly: "Businesses find it extremely difficult to identify the directly discernible job generation effects of infrastructure provision." (p.9). However, there have been interesting recent developments in location studies which we may refer to in a moment.

Alongside such general evidence, much research has focussed on individual transport investments. These have been variously summarised (e.g. Department of Transport (1977), Rietveld & Nijkamp (1993), Grieco (1994)) though the number of studies carried out in the UK is limited. The studies of the Severn Bridge (Cleary & Thomas (1973)), the Lancashire-Yorkshire (M62) Motorway (Dodgson (1984)), the strategic road network as a whole (Botham, 1983), and the Humber Bridge (Simon (1987)) are examples, though there are more (the findings of all the studies carried out over 20 years in the Yorkshire and Humberside region of the UK are summarised in Judge (1995)). Also, the Channel Tunnel has spawned several studies of its likely regional impact, e.g. Holliday et al (1991). Overall, the results of both British and other studies (Hey et al (1996) give a gloomy view at a European level) seem to be almost uniform in their findings that major transport investments do not seem to make much difference to the prospects of the regions that are meant to benefit from them (this is not, of course, to say that they are necessarily bad investments from a cost-benefit view point). On the contrary, research on the overall impact of the trunk road network (Botham, 1983) (rather than on small parts of it) suggests that the UK region likely to have benefited most from the interregional redistribution of jobs due to the network is the West Midlands. This is the reverse of what regional policy would have intended.

The question, however, does not rest here. Moving on to the subregional level, it has been pointed out e.g. Judge (1983) that even if there are no interregional effects to take account of, major schemes may affect the internal spatial development of a region. The link to detailed land use planning issues is obvious here. Most industrial movement is short distance, and a few per cent of firms move location every year. If transport facilities have an influence on detailed location (and some studies e.g. Department of Industry (1973)) suggest it does) then, for instance, the routing of major road schemes could affect the long-term distribution of job opportunities in a region. Though the total quantum of jobs may remain the same, the opportunity to manipulate their availability to

different sections of the community should be attractive to planning authorities if it can be shown that these effects occur in a predictable way. So far very little research has been done in this area.

The most recent work, which has only been published so far as a brief interim report, is, as indicated at the beginning of this section, that of the UK Standing Advisory Committee on Trunk Road Appraisal (SACTRA, 1998). This report is issued in circumstances almost contrary to those relating to this paper. Namely, the question is whether economic growth will suffer if road investment is cut back in the interests of environmental protection. The report concludes that “The available evidence does not support arguments that new transport investment in general has a major impact on economic growth in a country with an already well-developed infrastructure” (Ibid., p.1, para.3). However, it concedes that there are circumstances where the results of cost benefit analyses undertaken in imperfectly competitive economies may underestimate or overestimate the net benefits of a road investment. Research commissioned by the Committee, and to be featured in the finally published report, provides a theoretical framework for examining linkages between transport and the economy which may provide guidance as to the circumstances in which improved interregional transport links may work to the advantage or disadvantage of peripheral regions, or of industrial sectors within regions. However, it is not yet clear whether the data would be available to make operational the theoretical predictions (derived from input-output type models) and come to a practical judgement. Much of this work derives from work in the field of the “new economic geography” which provides some exciting research new perspectives which seem particularly relevant to the Polish situation. Much of the work is based on results from small scale models, and there appears to be little empirical work as yet. Space precludes detailed treatment here, though Judge (1998a) summarises and refers it to the Polish situation. It is now appropriate to move on to consider Poland, and after this the situation there will be aligned with the preceding discussion.

### **The Development of the Polish Highway and Motorway Network**

Poland occupies, in the post-1989 Europe, a pivotal location between east and west Europe, and between north and south Europe. The open borders after 1989 have generated tremendous international traffic, which has combined with similar internal traffic growth (Judge, 1996). Up to the present time this traffic has been carried on a normal road network which has not only not been designed for it, but which has not been maintained to anywhere near normal standards. (Figure 1 at

the end of the paper illustrates the main lines of the existing national road system in Poland). Thus the most recent report on the state of the road network (BPRSD, 1997) stated that in 1996 72% of the road surfaces of the national road network were in a “Bad” or “Unsatisfactory” condition. Current interurban road speeds are poor with a relative lack of bypasses necessitating the passage of large volumes of traffic through the centres of large, small and medium towns.

Thus the rapid growth in traffic after 1989 and the prospect of entry to the European soon led the Polish government to look at previous plans for motorway networks in Poland. The evaluation and updating of plans prepared in the 1970’s and 1980’s culminated in new proposals contained in a report of the Ministry of Transport and Marine Economy (MTME, 1993) and consequent legislation in 1994. The 1993 report proposed a network of motorways (autostrada) and expressways. As indicated in Figure 2 the motorway network of 2,600 km proposed consisted of two main east-west routes (A2 and A4), and two north-south routes (A1 and A3), plus a few other sections. The key proposal was that the motorways would be built as tolled motorways with predominantly private finance, while the expressways would come within the public road system financed from government sources. The recommendations of the report were given legal effect in the 1994 Act on Toll Motorways. This and subsequent enactments provides the basis for the system of concessions which are being allocated currently. The implementation of the planned system obviously has to be staged, and the envisaged progress at different dates up to completion is illustrated in Figure 2.

### **The Role of the Polish Motorway Network in Local and regional Development**

The role of the network in local and regional development can be considered from a number of angles. Firstly, we may consider what role this issue had in the 1993 planning exercise. Secondly, we may consider what role it has at the current level of implementation. The latter has three aspects: firstly, its role at a central authority level of implementation; secondly, its role at a local authority level; and thirdly, its role at the level of the individual, public and firms. Finally, we may consider this topic in relation to the current state of knowledge as discussed in the initial part of this paper. It will be convenient to consider the above angles in three sections. The rest of this section will consider the initial planning stage, and the current phase of implementation at central authority level. The next section will consider implementation at a local authority level, and the level of the



public and firms. As we are essentially concerned with expectations we shall call this section “Local Expectations of Benefit from the Network”. The following section after this will consider the theoretical perspective, and in what directions it might lead us in interpreting the likely impact on regional and local development in reality as a result of the development of the network. This section is entitled “Relating Past Research to the Polish Situation”.

In considering the role of benefits to regional and local development in the initial planning work, much of the work here was not formally published, and exists as internal working documents. However, from the meetings and discussions carried out with a range of individuals closely connected with the planning process, and from those documents available, it is possible to make a broad overview. A fairly large exercise looking at the likely economic effects of building the motorway system as part of the overall evaluation exercise was carried out at the Institute for Research on Roads and Bridges in Warsaw. A summary of the overall work from 1992 (IBDM (Institute for Research On Roads and Bridges), 1992) includes a section entitled “Effects Resulting from the Building of Motorways”. This forecasts increasing employment in firms building roads and bridges, and producing road materials of about 25,000 per year from 1993-1998, 31,000 from 1998-2002, and 44,000 from 2003-2007, plus thereafter about 6,000 jobs in motorway maintenance. In addition, the report forecasts additional employment in investments and economic activity springing up in the regions traversed by the motorways: this employment will be 5-10 times greater than the employment generated by the building work itself. There will be additional employment in cement works, steel works and plants producing asphalt: additional demand will be for instance 175,000 tons of cement annually. Reduced unemployment benefits paid to those finding work in construction, plus taxes paid by them, will benefit the State Treasury by 40 milliard old zloty, and expenditures generated in the corridors affected by the motorways will be five times greater than this. There will be increased tax revenues and increases in land values, all of which are estimated. The 1993 report of similar title from the Ministry of Transport (MTME, 1993) goes over similar ground in greater or lesser detail. For instance, the section on multiplier effects describes the knock on effects of building the motorways in a belt of land 40 km wide along the length of a section of motorway. A multiplier of 5 is estimated, whereby 1 zloty invested in the motorway will produce a consequent growth in output in the region of 5 zloty.

The calculations are based on World Bank recommended procedures. Without seeing the detailed calculations, comments must inevitably be circumspect, but some obvious points may be made. Firstly, where a financial and/or cost benefit calculation has been carried out to assess the economic worth of the investment itself, there is nothing wrong in expressing the same costs and benefits in a variety of ways. The key point is to avoid double counting, by assuming that all the effects discussed are additive rather than transitive in many cases ie one effect is simply another effect differently expressed. Given that economic evaluations were carried out, and that unless it is explicitly argued otherwise, it would be reasonable to assume that the net worth of the investments to the economy were expressed by the rates of return, and that all the other effects described above are ways of detailing the manifestations of the economic benefits at different levels, and in different areas of the economy, without implying that they are in any way additional benefits. This is not however to doubt the relevance or interest of these effects in particular parts of the country which are directly affected. However, it is also worth noting that any large investment programme will have knock on or multiplier effects, and will create new jobs in situations of unemployment. The key issue of course is longer term job creation, and the usual problem is to show that all the changes that seem to flow after the building of a new motorway are much different to what might have happened anyway over a larger area and in a more diffuse way.

As we come, only a few years later, to 1997 and 1998 where concessions are being allocated, one may ask what the significance of these calculations of indirect effects is at central government and agency level. On the one hand, these indirect benefits are quoted in material of a promotional nature. Thus, the first Polish Motorways Supplement the weekly "Warsaw Voice" (April 16th 1995) had an opening article by the then Polish Minister of Transport (Liberadzki, 1995) entitled "Foundations for an Economic Boom". Later in the same supplement, it is pointed out that in addition to all the direct transport benefits (e.g. 30-40% reduction in travel time), "The program will also stimulate the economy, especially in regions where the motorways will be built.....Some 150,000 to 200,000 new jobs will be created in travel centres, hotels, service centers and stores which will be built along the motorways" (Ibid., p.12). On the other hand, given that the motorway programme is being developed as a tolled system, the necessity to devise "bankable" projects means

that the indirect effects of investments on regional and local development seem to play no practical part, de facto, in decisions on particular concessions. The key factors are that within the parameters for environmental protection and impact, a concession has to be sufficiently profitable to pay back the loans raised to finance the construction during the period of the concession. This places the onus on the traffic forecasts from which are derived ultimately the toll revenues. Herein lies the problem at the present stage of network development, inasmuch as the desire of the Polish government to limit its investment to about 15% of the total (mainly in the form of land purchases) means that the forecast traffic levels combined with the toll levels thought feasible are possibly insufficient to provide viable returns on many concessions. Hence, there are arguments that the Polish government ought to raise its capital share to up to 50%, to make the private element viable. In other words, the government must foot the loss in financial terms, and then the question is what does it get in return? Benefits to regional and local development is one answer, but whether that will be the case is the subject of discussion below. (See Judge (1998a and 1998b) for further discussion on traffic forecasts).

### **Local Expectations of Benefit from the Network**

In this section we consider the role of motorway/highway investment in local and regional development in terms of expectations of benefit at a local authority level, and at the level of the individual, public and firms. There is at the present time, so far as the writer can establish, no body of research on this issue, and hence the discussion of this section is eclectic and interim, and drawn from a variety of disparate sources. By comparison with the experience of the UK in the 1960's and 1970's, the expectations of the general public in Poland about the likely economic impact of the new motorway system are relatively low key. In the UK there were usually very high expectations that a new motorway would definitely bring enhanced prosperity, new firms and jobs. Whether this was established in fact was seldom checked, and indeed the possible effects would, in a relatively advanced economy, be very difficult to disentangle from all the other changes taking place. In Poland, by comparison, the impression is one of greater concern with the environmental and direct adverse impacts, rather than with positive economic benefits. Such impressions are derived from interviews, and from scanning of various press sources (which may be taken as a broad indicator of the issues which generate concern with the general public). These reactions may be attributed to the

greater immediacy of the environmental impact compared with the uncertain nature of positive economic effects. Also of relevance is the fact that the imminence of the Polish motorway network as the harbinger of a new economic age has been trumpeted since the 1970's, so expectations may have worn a little thin. Thus, the celebrated case of the routing of the A2 Berlin-Moscow motorway through Warsaw is symptomatic. Although it will be several years before the route is built, the finality of actually fixing the route has generated enormous opposition (see Judge (1998b) for a discussion of this). Positive economic arguments in support are difficult to find in the media. The evidence collected from this source has still to be analysed in detail, but general impressions are of a low profile for longer term economic benefits (vis a vis earlier transport cost reductions) in relation to concerns about immediate adverse impacts. This situation is relevant to the way in which local administrations respond to the approach of new highways into their areas.

Local authorities, in terms of gmina councils and voivod administrations present a rather different picture. The general impression gained from a variety of sources is that local authorities are responding to the presence or absence of new highways near to them in different ways. Sometimes responses with relevance to anticipated economic benefits have to be attenuated in relation to the concerns of elected councillors about the anxieties of constituents on environmental and general impact issues. However, once these issues are set on one side, a number of strands of discussion emerge. The advantage of a good location on the motorway or interurban road network is progressively being incorporated into the promotional activities of the gminas, and also into local development strategies. And if gminas see themselves as not adequately served by the new proposed networks, lobbying is taking place to modify plans to remedy this. Equally, the issue of phasing of construction in relation to location on the network is important. And finally, the crunch question is: is there any evidence of actual activity in advance of construction?

The following discussion gives an overview of some of these issues in relation to the country as a whole, in a situation where research is still ongoing. The writer has had discussions with local authority representatives in a number of key locations on the network. Overall, they all seek to emphasise that they will be highly central and accessible. Three locations as an example where this appears to be highly accentuated are Lodz, the Gliwice/Katowice area, and Wroclaw. Lodz is at the

crossing point of the A2 (Berlin-Moscow) and A1 (Gdansk-Southern Europe) motorways. The location is critical. Although Lodz is almost central in the whole country, it has historically had poor connections in some directions, eg by rail. In spite of this, a combination of circumstances has led to some interesting circumstances which could accentuate the benefits it might accrue from its motorway location. Thus, the decline of its textile industrial base after the breakdown of the Soviet trading system after 1989 led to an upsurge of small textile businesses using auctioned machinery and innate skills. This combined with an upsurge in free market cross border trade with merchants coming from the former CIS countries to barter goods and carry back finished products in small or large quantities to sell on. This trade produced a rash of “bazaars” around the country. Visitors to Warsaw will most often have been told of (if not visited) the famous Stadion where anything from a pair of socks to a Kalashnikov can be bought at minimal prices. However, the largest bazaar in Poland is at Tuszyn some 15 km south of Lodz. Hard figures are difficult to come by, but it is thought (prior to the recent imposition of EU visa regulations at the Ukrainian and Bialorussian borders) that the trade going through this bazaar was of the order of \$2 billion per annum. The products of the Lodz workshops go straight to the bazaar for onward carriage to the east in coaches, vans and private cars. The expectation is that the A1/A2 will increase the “pulling power” of the area and bring even more business. This potential is publicised in the promotional material of Lodz City Council. Other more concrete responses relate to the location of new “economic zones” and freight transport interchanges accessible to the motorways. The regional strategy says that insufficient advantage is taken of Lodz’s present location (Lodz Regional Development Agency, 1997, p.59).

Gliwice and Katowice represent if anything a more interesting case. They are two main centres of the Silesian conurbation, the main industrial region of Poland. On the maps of Figure 2 it can be seen that they are already served by sections of what will be the A4 and A1 and A3 motorways. The A1 and A3 are two main north-south routes, while the A4 runs through southern Poland from Germany to the Ukraine. Already last year the upgrading of the pre-existing section of A4 (a former autobahn) to modern motorway standards was completed, and the first tolled motorway from Katowice to Krakow is already operational. Hence, the major cities of the Krakow and Katowice voivods are already connected. Gliwice has been a centre of attention because the new General

Motors car plant is located there, from which new production will commence shortly. The location of the city on the new motorway network cannot have been an insignificant factor. Equally, the city has energetically made plans to promote a road rail freight interchange to exploit location on both the motorway and high speed rail network. Similar remarks apply to Wrocław on the A4 motorway, where the Bielany interchange area on the southern perimeter of the city has already seen the location of many Western firms (eg Cadbury) in advance of the opening of the motorway itself.

What if a local authority is not at a good location on the new network? Casual observation indicates in a large country many centres which are going to turn out to be longer distances than others from the nearest motorway interchange. It does not require knowledge of the latest research on regional economics for gmina councillors to realise that their relative attractiveness as a location for new firms may be affected. One good illustration of this is in eastern Poland, where councils in cities like Białystok, Zamosc and Przemysl along the border argue for a further north-south route linking them to avoid the possibility that the east-west A2 and A4 will draw influence away from them to the larger cities further west. This worry is heightened currently by the current proposals to reduce the number of voivods, currently 49, by two thirds to create larger regional units, which would mean several voivod capitals losing their status, and increasing worries about future prospects. A further symptom of these worries was the study commissioned last year by BPRSD (Politechnika Warszawska, 1997) to look at the existing network proposals in the light of demands around the country that links should be upgraded to motorway or expressway status. While recommending some revisions, the results of hard traffic evaluations and soft assessments of the economic development issues in the as yet unpublished report apparently dashed the hopes of most aspirant local authorities seeking significant changes.

Even if a local authority has a good location on the network, worries may be raised about the projected phasing of development. This is especially the case where low traffic projections are delaying the raising of finance for specific concessions. The most worrying cases here appear to be the north-south routes connecting the northern ports to the rest of the country. In the worst position is the western A3 connecting Szczecin to Wrocław and Silesia and onward south. The problem here is that there are existing parallel motorways in Germany just across the border. But

even the traffic projections for the A1 are apparently not that bright (see Judge (1998a)). The situation with these north south routes is problematic. There has always been a debate in Poland that the east-west routes were primarily in the interests of the EU, Germany and Russia, while the north-south routes maintained the viability of the northern ports, and were in fact competitive with the east-west routes. This is because it is becoming progressively more feasible to ship cargo to Poland and further east through Rotterdam, Hamburg and Bremen, rather than taking the longer sea route to Szczecin or Gdansk/Gdynia. There are reports that Polish forwarding companies have already moved to Bremen. This situation will be made worse once the early sections of the A2 and A4 are completed. Diagram 2 indicates the phasing of the motorway network, and it is clear that the southern and western half of the country will be connected to the motorway system sooner than the northern and eastern half. Thus the relative accessibility position of some areas of the country will be made worse by the phasing of the network development. In particular, the eastern regions have always been the least developed. (See Judge (1998a) for a discussion of this in relation to the A2 motorway).

Finally, is there any evidence of actual activity in advance of construction? Are new firms setting up in the expectation of being located near to a motorway interchange? Is the property market reflecting expectations? So far, a rather contradictory set of impressions can be gathered around the country. There does not appear to have much explicit monitoring done yet. This may be for the very good reason that it is too far ahead before links will be complete. Equally, no surveys have been done on location decision making to distinguish the effect of the motorway from other location factors. In fact, the evidence quoted earlier may place the existence of a motorway as a lower order micro location factor. Indeed, in the current development environment it might be suggested that there are other factors much more important, such as access to serviced sites and a responsive and pro-active local authority. If these do not exist then a good motorway location may be of little value. Nevertheless, despite the difficulty in getting any firm impressions in this area, there does appear to have been considerable activity in the property market in some parts of the country, notwithstanding efforts on the part of the Motorways Agency to limit property speculation. As ever, it is difficult to get beyond verbal reports to hard data. Even in the occasional situations where it was possible to track individual property transactions, or land price trends, it is difficult to

separate the influence of motorway accessibility on site values in the often substantial price movements observed from the general trends in a progressively more buoyant market, from inflation, and from currency restructuring. Clearly, there is material here for research for some years hence. There is obviously much development in the area of out of town shopping development which is taking place already, and which will no doubt see substantially extended market areas once the new networks are built, but it is possible to argue that much of this development would have taken place anyway in response to market demand.

### **Relating Past Research to the Polish Situation**

This paper is looking at a topic which has only been examined in a partial fashion, if at all, up to now. The literature review earlier indicates that while it is not hard to defuse the most extravagant claims about the effects of transport investment on local and regional development, this does not mean that the issue should be ignored. Even if traffic evaluations of investments are accurate, some local authorities are bound to benefit at the expense of others, and the variety of possible outcomes needs to be considered in development strategies. And suitable studies will help in this.

However, it is possible to see that the latest research, while recognising that some regions may gain or lose (road investment is not a panacea for local economic problems), also generates the need for further research to predict more precisely the conditions under which areas will gain or lose. But there are two key questions to consider at this point. The first is that the last two sections have addressed practical questions of how developmental issues have figured in the planning process at central and local level, and what are the expectations and initial results on the ground. This is reasonable, as we are considering investments not yet completed. Thus is there any local research which, while not addressing the specific motorway issue, nevertheless casts some light on it? A second question to ask is whether the research reported earlier is uniformly applicable to the Polish situation?

On the first question, it would be useful to know if there are any Polish studies which suggest that accessibility issues have affected development in the past. An initial reaction might be to suggest that in the period before 1989 location decisions were made on a nonmarket basis, and enterprises



were often located to provide employment rather than to minimise costs. One source is the results of recent work on regional disparities in Poland. Zienkowski (1997) analyses the reasons for variations in regional gross product per head (a proxy for the level of economic development of the region) and finds that 83% of the intervoivod variation can be explained by variation in gross value added per worker (a proxy for labour productivity), and percentage of employees in industry. These factors reflect the past economic development pattern of the country eg the split between the developed west and the less developed east. For our purposes, there appears to be no explicit consideration of accessibility issues. This is not of course to say it might not be significant if introduced as a variable. Equally, Dziembowska-Kowalska, Funck and Kowalski (1997) consider the factors stimulating or disadvantaging the growth of Polish regions, and seem to make no explicit investigation of transport factors. They look in particular at two regions, Lodz and Gorzow, and in the case of the former make no mention of transport issues, while with the latter, a passing comment is made that this border region on the line of the Berlin-Poznan-Warsaw motorway is likely to see development as a result, but there is no consideration of the role that transport may have had in explaining past development patterns. Again, there is no reason to suppose that the introduction of transport variables into the analysis may not produce some results, but it simply appears not to have entered into the equation. However, an interesting footnote to this part of the discussion is that Orłowski (1997) looks at likely net job creation 5-10 years after Polish accession to the EU, and predicts that almost all the eastern voivods (except Warsaw) will lose 1-5% of their employment, with one (Zamosc) losing 9%. There is clearly some scope for further work here in terms of the matters considered in this paper!

If one is short of research in Poland per se on the subject of this paper, can we transfer the results of research reviewed earlier in the paper? While one cannot without care carry over the experience of one country to another (Grieco, 1994, p.8), nevertheless, it is a starting point. Thus, the experience of research carried out in the UK and Europe suggests caution in expecting too much effect on local and regional development from motorway investment. However, there is nevertheless a need for assessment of effects, whatever their magnitude. But we should also note that often the results of such research refer to transport developments in advanced economies with well developed infrastructures. The situation in a country like Poland is actually much more complex than the sorts

of situations considered in much of the research quoted above. Firstly, the infrastructure being provided is much more than marginal additions to existing networks, but will constitute a qualitative and quantitative jump in accessibility for many parts of the country. Combined with an economy which probably still has great room for the evening out of monopolistic/price distortions, and structural and spatial imbalances, the overall network effect could well be significantly greater than the investment worth calculated in a cost benefit analysis. In addition, the international and cross border effects have to be considered. In situations where borders have been closed for 40 years, the potential for beneficial trade boosted by better roads seems significant. Equally, the strategic position of Poland in relation to Trans European Road networks may well bring benefits which are not considered in the sort of research reviewed so far. Thus, while not expecting any enormous local and regional development benefits at a regional level over and above those estimated by a normal appraisal, there nevertheless seems to be some case for studying the Polish situation to identify the potential gainers and losers at a regional level from transport infrastructure investment, and also to study the way in which the Polish situation differs from the sort of research reviewed earlier in this paper.

## **Conclusions**

This paper has sought to make links between UK and West European research and the current situation in Poland on the likely effects on local and regional development of motorway and highway investment. It has reviewed existing research in this field, and then reviewed the role which this issue has had on the planning and implementation of the Polish motorway and highway network. It then considered the extent to which existing research could be applied to the Polish situation. It concludes that there is some benefit to be gained from evaluating the Polish situation in the light of this research, but that given the paucity of existing research in this field in Poland, and the features of the Polish situation which will not be considered in existing research, there is some considerable value to be gained from studies of the impact of new investments as they are completed.

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Note on referencing: references are given in the language of the original source and where it seems appropriate an English equivalent is given afterwards in brackets. Where the author is an organisation with a relatively well known initialled short form, the initials and long form (in brackets) have been used on first mention in the text, while only the initialled form is used thereafter, while references are cited with the initialled form in author position, with the long form given after the title of the work. Polish text is rendered without accenting.

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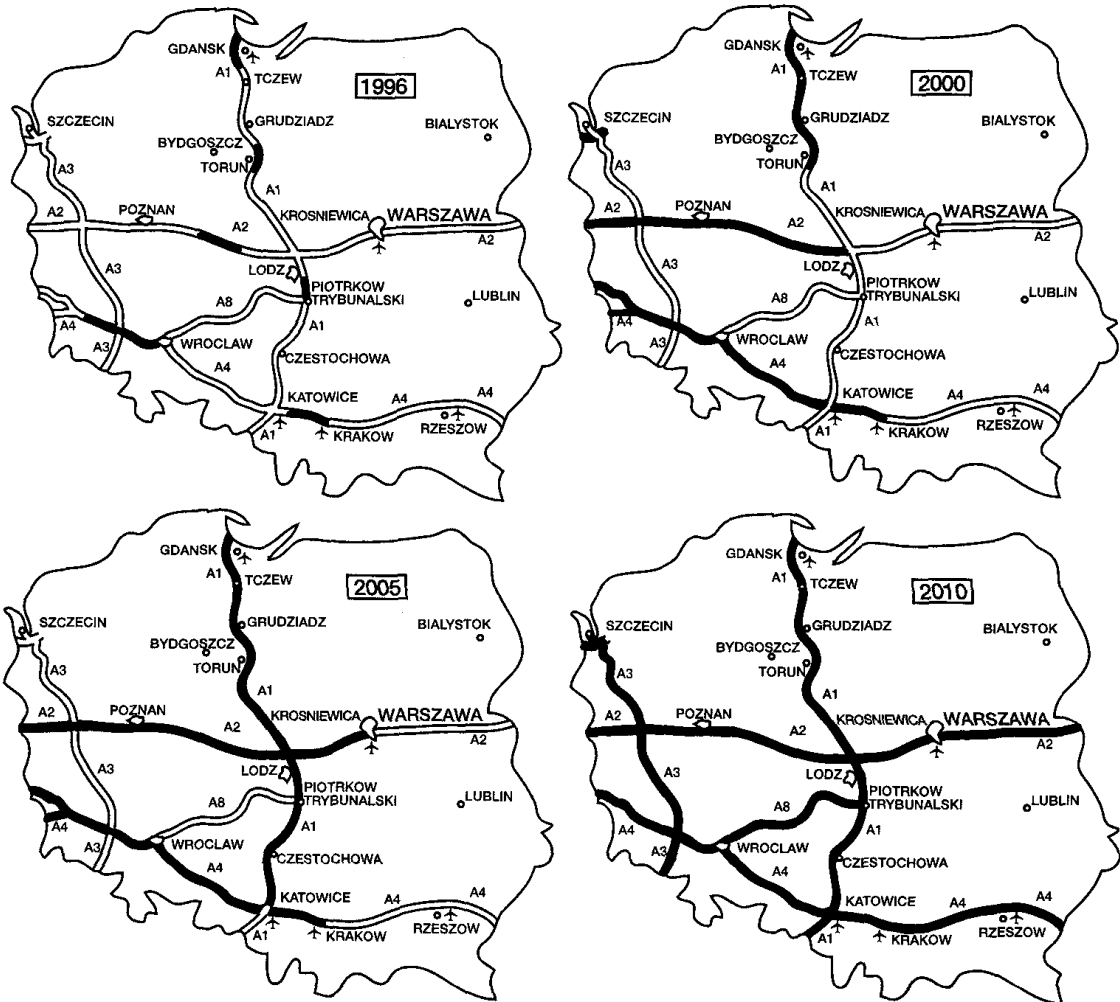
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**Fig.1 The Existing Road System in Poland**

Source: NFEPWM (1997) Fig 3.1



**Fig.2 Phasing of Polish Motorway Development Programme**

Source: NFEPWM (1997) Fig 4.4