



UNIVERSITÀ DEGLI STUDI DI BERGAMO

**COUNTRY STUDY - POLAND. POLISH PROGRAMME
OF MOTORWAYS CONSTRUCTIONS
- BARRIERS OF IMPLEMENTATION**

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1. Introduction

The underdevelopment of motorways and expressways network causes an isolation of Poland from the rest of Europe. In present conditions, it is not possible to attract desirable flows of foreign investments¹ in Poland as well as to develop important logistic centres of distributing goods produced in different European countries. In their decisions, foreign investors take into consideration world rankings of competitiveness and an environment for international competition, including quality of transport infrastructure, especially road and air. The advantage of well-developed rail network is not a vital argument, since railways do not show ability to adjust their activities to requirements of logistic operators².

Delays in expansion of road infrastructure in Poland were built up in the post-war period in a diversified intensity (it is illustrated in table 1). One positive effect can be noticed that since the beginning of nineties, for the first time in the history of Polish motorisation, the average annual growth of motorway network has exceeded the pace of increase of the number of vehicles.

Table 1 Imbalance between growth rate of road network and number of vehicles in Poland in the years 1946-2004

Years	Average annual growth rate of total road network (%)	Average annual growth rate of motorway network (%)	Average annual growth rate of number of vehicles (%)
1946-1960	0.81	0.00	18.45
1961-1975	2.12	0.00	8.14
1976-1990	1.61	4.40	5.59
1991-2004	0.82	6.70	4.14

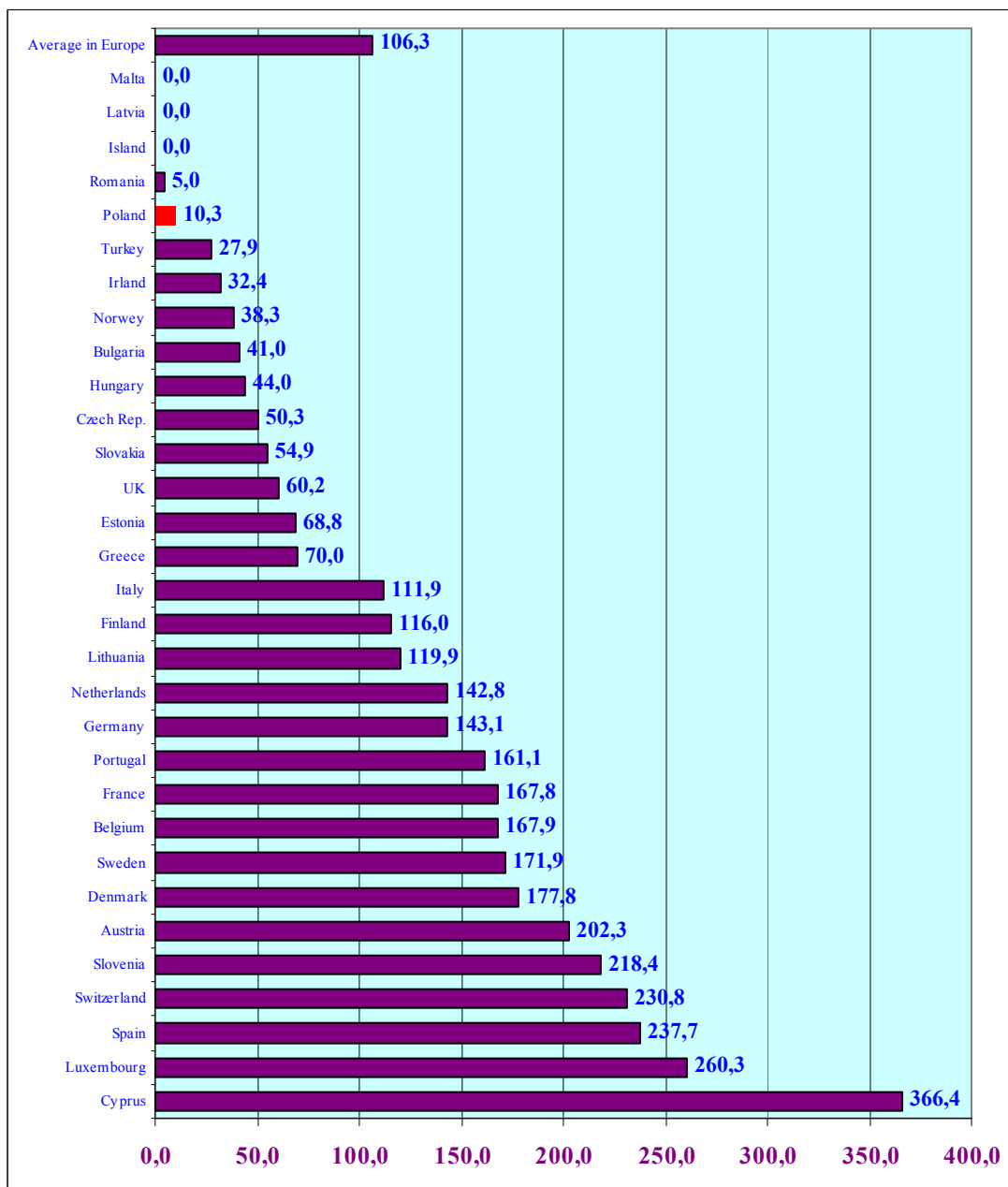
Source: Department of Comparative Analysis of Transportation Systems, University of Gdansk. Sopot 2004.

In spite of the acceleration of investment efforts in the range of motorways construction, a distance between Poland and different European countries has still remained huge. Taking into consideration length of motorways per 1 million of citizens in 2000, Poland takes a 27th place on the list of 31 European countries. The indicator for Poland amounts to 10,3 km per 1 million citizens, while the average number for 31 countries is 106,3 km per 1 million citizens (see figure 1). In order to achieve this European average, the length of motorways in Poland should increase from 523 km to above 4000 km, what would require the investments of more than 70 billion of PLN (ca 15-16 billion €).

¹ Several times in the years 2002-2003, international car-producers' consortiums selected locations in other Central European countries, instead of Poland, though originally they assumed to invest in the country.

² If international rail transport in Europe is characterised by average speed of 16 km/h and takes often even two weeks, it is clear that the road truck becomes the best transport mean in logistic system, since it is able to provide goods in any European relation during 2-3 days.

Figure 1 Length of motorways in Europe per 1 million of citizens in 2001

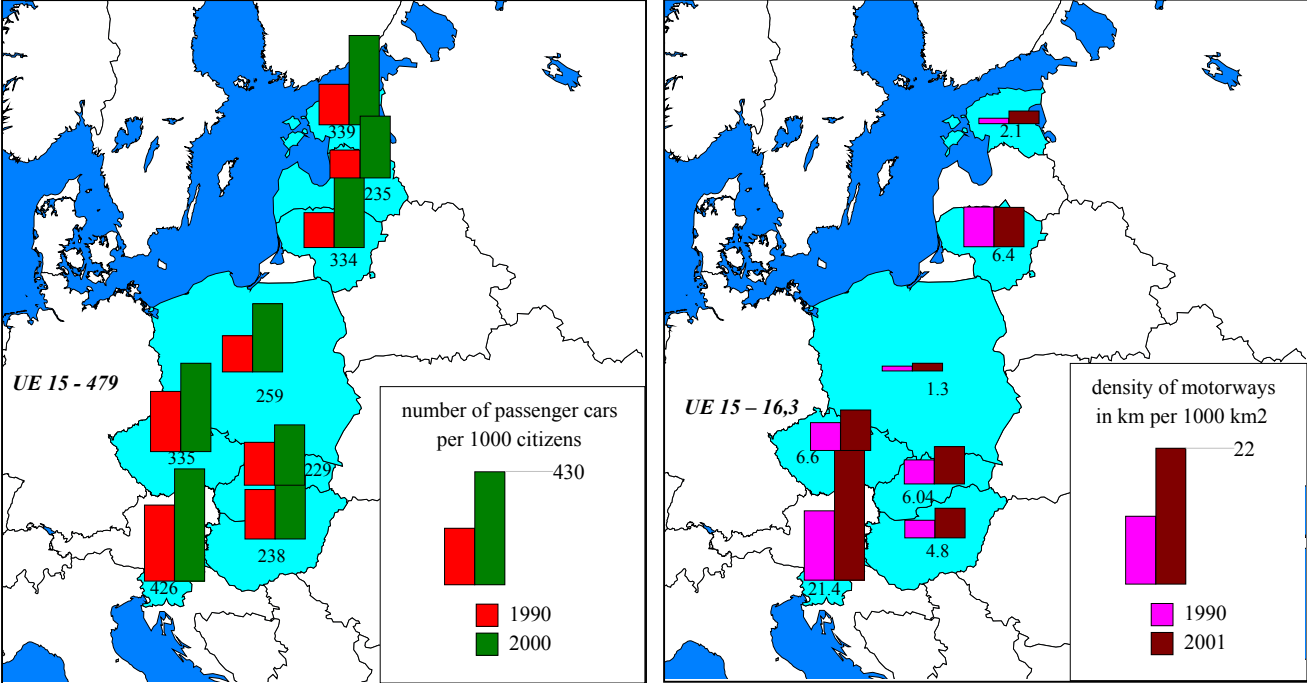


The comparison of development of Polish motorway network with other new EU member states conditions is very unfavourable for Poland. In spite of success in the process of transformation as well as positive legal and organisational changes influencing implementation of investment plans, still the pace of motorways construction in the nineties and from the beginning of new millennium has not been so dynamic as it could be expected (the evolution of motorways length in the years 1990-2004 is presented on figure 2C).

Figure 2 Private motorisation growth and extension of motorways network in Poland on the background of other new EU member states

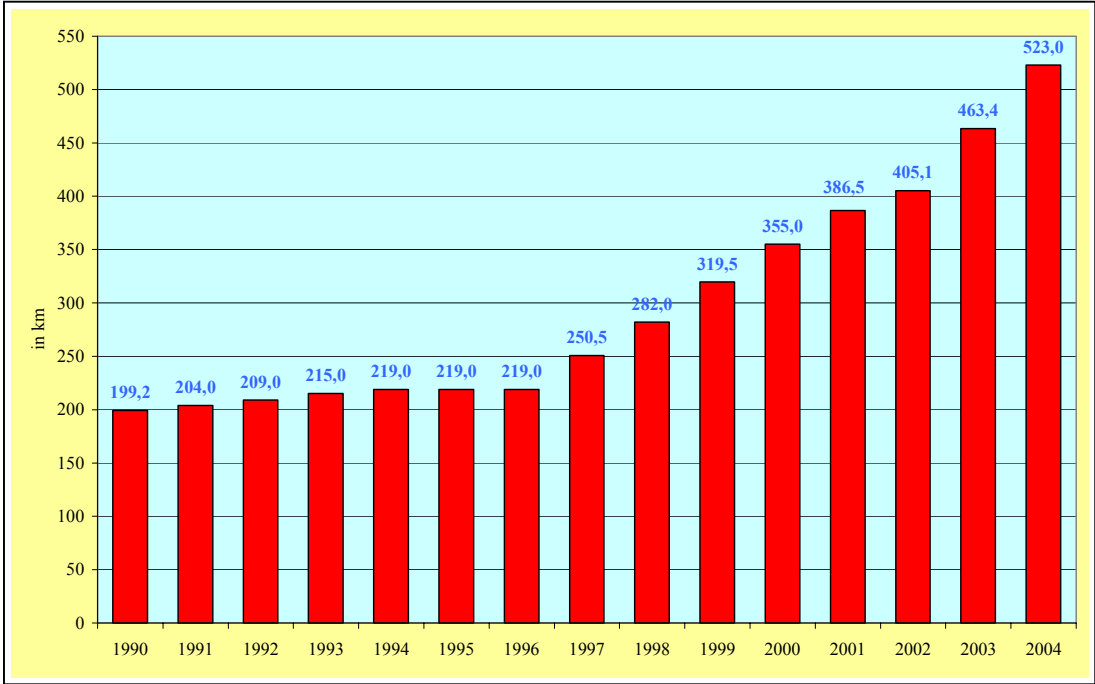
A. Number of passenger cars per 1000 citizens

B. Density of motorways in km per 1000 km²



* data on maps concerns year 2000 / 2001

C. Extension of motorways network in Poland in the years 1990-2004 in km



Sources: UNECE data. www.unece.org/stats/trends; EU ENERGY & TRANSPORT IN FIGURES 2003. European Commission Directorate-General for Energy and Transport; Statistical Yearbook on candidate countries. Data 1997-2001. European Commission, 2003.

High increase of road traffic resulting especially from boom of private motorisation is common for all post-socialist countries. In figure 2A it is presented the number of passenger cars per 1000 citizens at the beginning of transformation and after 10 years of changes. In every country the indicator has increased up to 200 cars per 1000 persons. And, though it is still far from EU-15 average, which amounted to 479 vehicles per 1000 citizens in 2000, but growth in this period, especially in Slovenia, Czech Republic and Lithuania has been impressive. It can be noticed simultaneously that motorways infrastructure investments have fallen behind dynamic growth of road traffic (see figure 2B). Again, the exception is the indicator for Slovenia, where density of motorways amounts to more than 20 km per 1000 km², what is higher value than EU-15 average amounted to 16,3 km per 1000 km². The fatal number for Poland (1,3 km per 1000 km²) places the country at the end of the ranking of EU new member states (excluding Latvia, but in this country it is a lack of data concerning motorways). Polish neighbouring countries like Czech Republic, Slovakia and Lithuania can boast considerably higher density of motorways, on the level above 6 km per 1000 km².

2. Brief history of conceptions of motorways development in Poland

In post-war Polish history, the first plans of motorways construction have appeared in 1946. In these projects, a special emphasis has been put on North-South connections. Projected motorways network seemed to be very impressive (see figure 3A). Unfortunately, it has never been succeeded to realise even small part of the plans. Development works on the motorways and expressways system in Poland have been continued in the sixties under the auspices of UNDP within the programme under the title “ Model of Road Network in Poland”. Then, in the seventies, some spectacular infrastructure investments have been realised (especially in building and heavy industries), because of high foreign loans raised by socialist government of that time. Then, projects assumed to prefer connections of Silesia and Warsaw (see figure 3B). In 1991 (figure 3C), first programme after the initiation of transformation was published. It assumed the realisation of 2600 km of motorways, including A-1 from Gdansk to the border with the Czech Republic, A-2 from the border with Germany to the border with Belarus, A-3 from Szczecin to the border of Czech Republic, A-8 from Wroclaw to Lodz and A-12 from Olszyna to Krzyzowa (as a supplement to the A-4 motorway). Further programmes, including the first of 1993³ and the latest of 2003⁴ was not so optimistic, and assumed to build only 3 following motorways of total length of 1994 km (see figure 3D)

- A-1 (564 km),
- A-2 (651 km),
- A-4/A-18 (779 km).

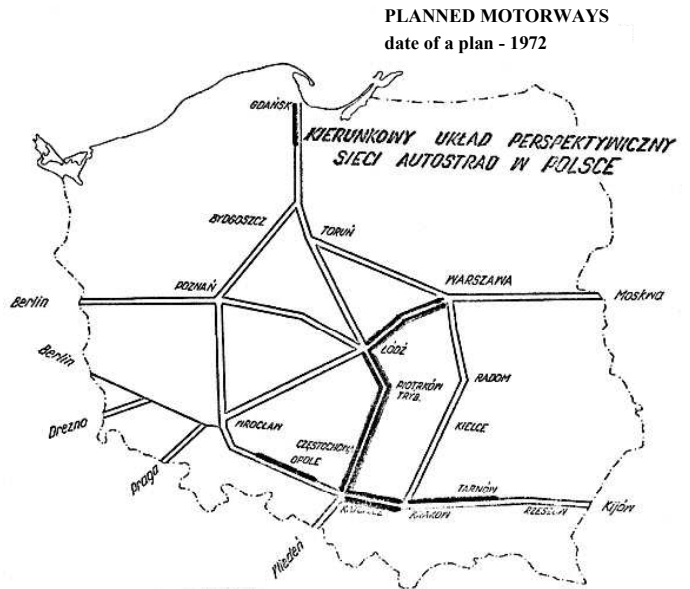
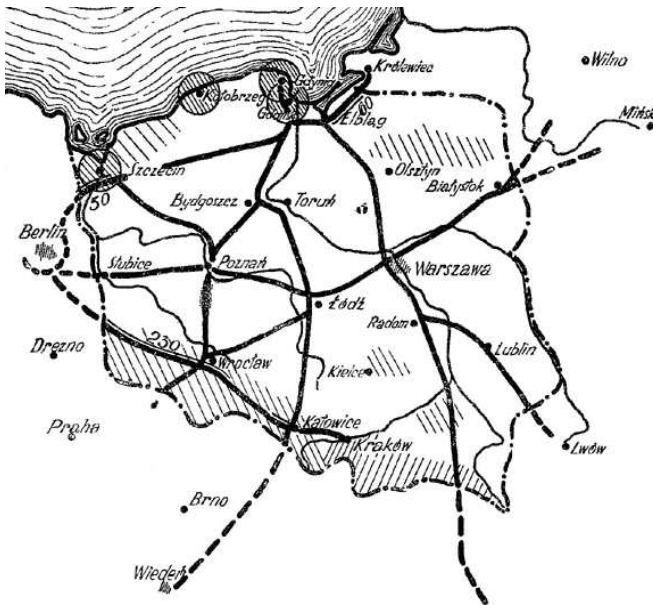
³ Programme of motorways construction in Poland. Ministry of Transport and Maritime Economy. General Directorate of Public Roads. Warsaw, July 1993.

⁴ See: General Directorate of National Roads and Motorways – Programme of motorways construction in Poland. <http://www.gddkia.gov.pl/html/pba2003.pl.htm> 19.02.2004.

Figure 3 Evolution of conceptions of motorways expansion in Poland

A. Plan of motorways construction of 1946

B. Plan of motorways construction of 1972



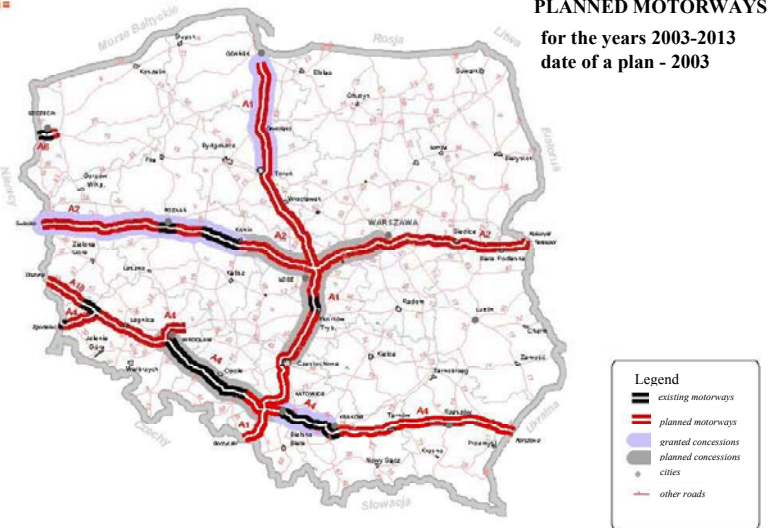
C. Plan of motorways construction of 1991

D. Plan of motorways construction of 2003

PLANNED MOTORWAYS AND EXPRESSWAYS date of a plan - 1991



PLANNED MOTORWAYS for the years 2003-2013 date of a plan - 2003



Sources: <http://www.gddkia.gov.pl>, www.autostrady.com
http://homepage.ntlworld.com/mark.gajda/autostrady/root/autostradycom_004.htm

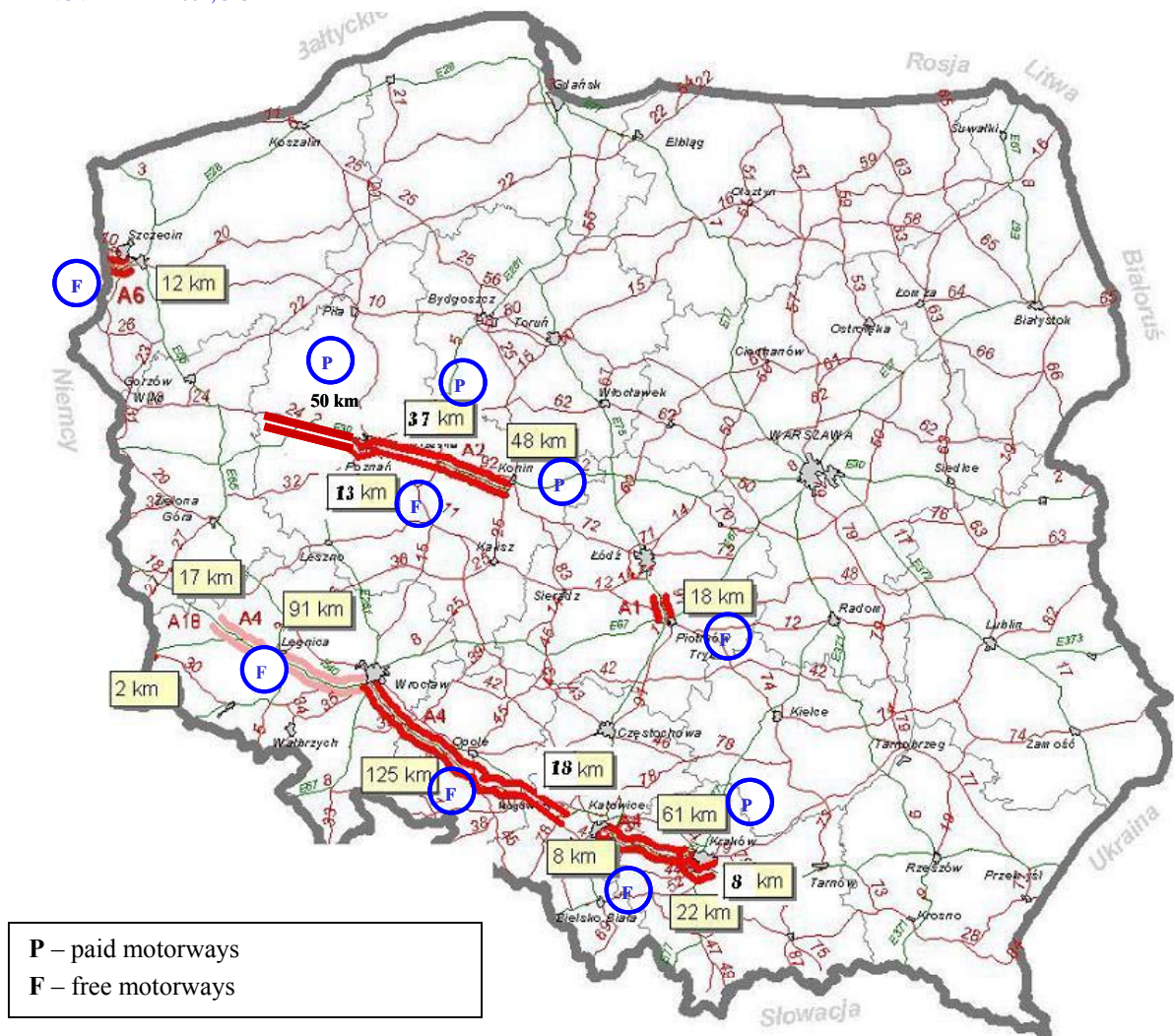
3. Practical realisation of programme of motorways construction in Poland in the nineties and beginning of new millennium

At the turn of the century, some positive results in the motorways expansion in Poland appeared. As far as in the years 1946-1979, there had been built only 109 km of new motorways, in the eighties – additional 80 km, and in the nineties - 156 km, but then in the years 2000-2004 there have been completed next 119 km. Nevertheless, still the government has not managed to realise its plans, i.e. building 550 km of motorways in the years 2002-2005 (including 150 km of totally modernised sections of existing expressways) and to start construction of next 500 km of new motorways⁵. The present condition of motorways network in Poland is presented in figure 4 and table 2.

Figure 4 Paid and free motorways in Poland (in November 2004)

POLISH MOTORWAYS.

NOVEMBER 2004, 523 KM



⁵ Infrastructure – key to development. Annex to the Economic Strategy of the Government SLD - UP – PSL. Enterprise – Development – Labour, approved by the Council of Ministers on 29th of January 2002.

Most of existing sections of A-2 motorway has been built in the concession system on the basis of paid roads. The longest uninterrupted segment of Polish motorway concerns A-4 motorway, built by public sources. This motorway is free, excluding 61 km long paid section, exploited by concessionaire. Whereas, North-South motorway A-1 practically does not exist (only small 18 km long segment in central Poland was built in the seventies).

Table 2 Present stage of motorways construction in Poland

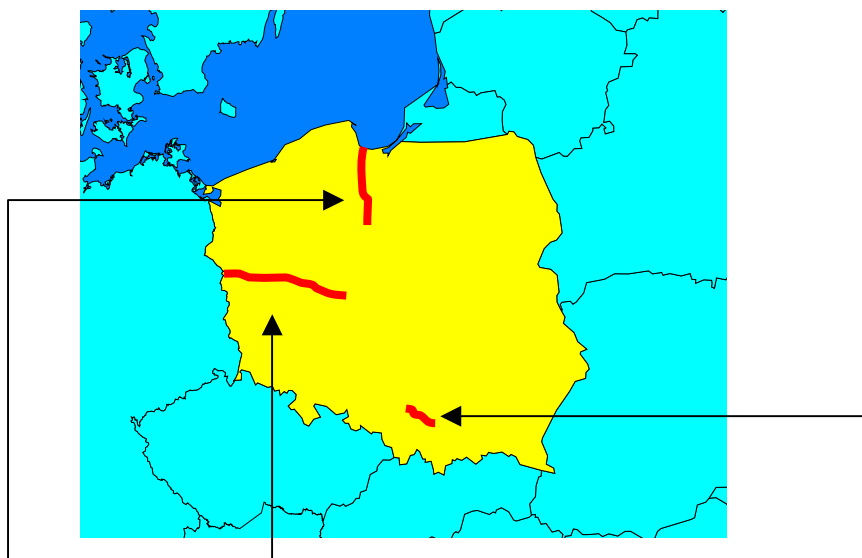
No	Route	Total length (in km)	Realisation
A1	Gdansk - Torun – Lodz - Czestochowa - Gliwice - Gorzyczki (border with the Czech Rep.)	564	17.5 km – section in operation (in the central Poland), new investments – predicted start at 2005
A2	Swiecko (border with Germany) - Poznan - Warsaw - Siedlce - Terespol (border with Belarus)	651	under construction, already completed 150 km
A4	Jedrzychowice (border with Germany) - Wroclaw - Katowice – Cracow - Korczowa (border with Ukraina)	779	under construction, already completed 350 km
A6	Kolbaskowo (border with Germany) - Szczecin	21	already completed 14 km, planned modernisation of the remaining section
A18	Olszyna (border with Germany) - Krzyzowa (connection with A-4)	70	modernisation from 2005

Source: Own elaboration on the base of: <http://www.gddkia.gov.pl>, www.autostrady.com

In Polish transport policy approved in the middle of nineties, it was assumed that motorways construction in Poland would be realised mainly in the concession system, and exploitation then would be paid. The Programme of Motorways Construction realised from 1994, dispelled hopes for quick improvement, and its effects were poor. Later, the evolution of the Programme realisation was changed from pure BOT system financing towards public and private partnership setting up an increase of state funds involvement. These two solutions did not exclude running in parallel traditional system of motorways construction, with public funds and financial means getting by the state. Nevertheless, taking into consideration the scarcity of public funds, this traditional system was treated only as a complementary solution.

In 1997 after appropriate proceeding, several concession was granted: ■ A-4 , section from Cracow to Katowice (61 km) – for adjusting existing motorway to paid system and operation; ■ A-2, following sections: Swiecko – Poznan (157,06 km), Poznan – Konin (98,2 km), Konin – Strykow (104,5 km) – for building and operation of paid motorway, in 1999 the concessionaire abandoned the section Konin - Strykow); ■ A-1, section from Gdansk to Torun (151,9 km) – for building and operation of paid motorway. Only first project of this list was put in force without significant perturbation. At present, the first section of 150 km long is operated. The realisation of remaining two projects was faced with difficulties.

Figure 5 Summary of construction and exploitation of motorways in concession system



A-1	A-2	A-4
<i>Aim of the concession</i>		
Construction and operation of motorways Gdansk –Torun 152 km	Construction and operation of two sections of motorways: Konin-Nowy Tomysl (including modernisation of existing section Konin-Wrzesnia), without ring-road of Poznan built by public sources; and Nowy Tomysl-Swiecko	Adjusting to charging system and operation of section of A-4 motorways from Katowice to Cracow (61 km)
<i>Concessionaire</i>		
Gdansk Transport Company	AWSA (Autostrada Wielkopolska S.A.)	Stalexport (from 2004 Stalexport Autostrada Malopolska S.A.)
<i>History of granting and concession and conclusion of a contract</i>		
December 1995 – Agency of Motorways Construction and Operation (ABiEA) advertised for tenders 1997 – granting concession; August 2004 – conclusion of a contract between GTC and government	September 1995 – Agency of Motorways Construction and Exploitation (ABiEA) advertised for tenders March 1997 – granting concession (for 40 years), conclusion of a contract between AWSA and government	June 1995 – Agency of Motorways Construction and Exploitation (ABiEA) advertised for tenders March 1997 – granting concession conclusion of a contract between Stalexport and government
<i>Realisation of a contract</i>		
no	2002 – completing modernisation of existing section Konin-Wrzesnia (47,7 km) 2003 – completing new section Wrzesnia-Krzesiny (37,5 km) 2003 – taking over for operation a ring-road of Poznan (free segment of 13,3 km) 27.10.2004 – completing new section Komorniki-Nowy Tomysl (50,5 km) remaining section – Nowy Tomysl - Swiecko (104,5 km) – planned completion in 2007	April 2000 – charging a fee
<i>Charges</i>		
no	3 sections of the same price, i.e. pass.cars and motorcycles – 3x11 PLN (ca. 2,60 EUR), trucks, 2 axles – 18 PLN (ca 4,2 EUR), trucks, 3 axles – 27 PLN (ca 6,3 EUR), trucks > 3 axles – 42 PLN (ca 9,9 EUR) non-standard vehicles – 110 PLN (ca 25,8 EUR)	pass.cars and motorcycles - 10 PLN (ca 2,3 EUR), trucks - 22 PLN (ca 5,2 EUR)

Media and some environments (regional, seaports etc.) accuse government of delays in motorways construction. In reality, rather objections of ecological lobbies and local communities seem to be a weak point in realisation of every road investments' programme.

In 2000 the government tried to actuate the motorways construction and proposed some solutions and improvements⁶:

1. system of public and private partnership in motorways investment,
2. transparent rules of bids and contracts between concessionaires and government,
3. improvements aiming at decrease of transaction costs, e.g. by legal adjustments.

In order to realise public and private partnership it was assumed to accept the catalogue of forms of the state involvement (wider than so far) in financing motorways investments. Then, in the project of amendment of the Act of paid motorways it was suggested to establish new National Motorways Fund (pl. Krajowy Fundusz Autostradowy - KFA), placed at the Bank Gospodarstwa Krajowego (responsible for government's projects). The purpose of the Fund was assumed as a formation of long-term public financial sources, e.g. from vehicle excise taxes. Unfortunately, in practice, according to the lack of executive regulations, the Fund did not begin to operate.

In 2002, new (leftist) government made an attempt to stimulate motorways investments. It was provided that the activities of government would be intensified in the range of implementation of the programme and that the state would take over the initiative in diversification of sources of financing as well as efficient starting-up new projects. In order to achieve the purpose, the organisational structure responsible for motorways construction was strengthened. Therefore, the Agency of Motorways Construction and Operation (Agencja Budowy i Eksploatacji Autostrad, ABiEA) was joined to General Directorate of Public Roads (Generalna Dyrekcja Drog Publicznych, GDDP), and General Directorate of National Roads and Motorways (Generalna Dyrekcja Drog Krajowych i Autostrad, GDDKiA) was formed. This new institution was obliged to work efficiently towards realisation of the tasks concerning development of motorways, as well as expressways and remaining public roads. Of course, simultaneously it was admitted that extension of the responsibilities of the state did not mean an abandonment of the private partnership. On the contrary, it was foreseen that organisational and financing strengthening of the GDDKiA and establishment of the National Fund of Motorways should facilitate more efficient public and private partnership. But the most important challenge and also the instrument of achieving a purpose and making progress in motorways investment, was the implementation of the vignette system charged all transport infrastructure users. It appeared to be an unrealisable task due to resolute social resistance.

In 2003, still any radical progress was not made. Again, the crux of the matter consisted of forming additional sources of financing. In order to break an impasse, the government decided to suggest further legal initiatives concerning:

⁶ Speech of Minister of Transport and Maritime Economy T.Syryjczyk in Polish Parliament. <http://www.syryjczyk.krakow.pl/autostrady.htm>.

- 1) Act of specific rules of preparation and realisation of investments in the scope of national roads (approved by the Parliament / Sejm, 10 April 2003), which considerably simplified the procedure of location and obtaining real estates in the investment process;
- 2) Act amending an act of paid motorways of 1994, with a major provision to form additional financing instrument in order to support road network managed by the General Directorate of National Roads and Motorways. On the base of the Act, the previous National Motorways Fund (in practice not implemented) was replaced by the National Road Fund, supplied by new fuel charge. The government suggested the amount of the charge on the level of 95 PLN per 1 tonne of fuel (ca. 20€ per 1 ton) and the Parliament passed even highest burden - 105 PLN per 1 ton⁷.

In 2004, the next amendment of the Act of paid motorways (of 1994) had to be approved, since after Polish accession to the EU, it was not allowed to charge fuels imported from the EU countries (as intra-community import). According to the amendment, the state managed to collect funds from domestic sources (local producers) and fuel importers. Therefore, expected total revenues resulted from these charges are going to be at the same level as assumed earlier.

4. The significance of motorways in transport and economic system in Poland

Actual and reduced programme of motorways construction up to 2013 seems to be a symptom of realisation of minimal variant of investments. Though spatial layout of planned network has been logical from geopolitical point of view, but it has raised some doubts of professional groups and regional communities, which have followed an aim of taking advantages from the schedule and the way of realising specific motorways projects⁸. Moreover, it has to be remarked that the impact of motorways on economic development of the whole country would be more favourable if the length of paid sections is short. In 2001, in the EU-15, almost 20 thousand km of motorways (in detail 19 962 km) has been operated as paid sections (ca. 38 % of total network). In Poland, it is assumed, that majority of the network will be paid, what will probably bring about reduction of transport demand both in the segment of industry enterprises and private motorisation users. Paid motorways cause an increase of costs of logistic services and influence negatively competitiveness of products, sectors and regions. For Poland, the ideal solution would be free motorways connecting major agglomeration of the country, especially on the North-South axis: Gdansk (Tricity) – Bydgoszcz/Torun – Warsaw/Lodz – Cracow/Katowice (principal Polish “business arterial road”).

Financing conditions of motorways construction in Poland in the years 2004-2013 (until the end of next financial perspective of the UE) exclude possibility of substantial

⁷ Article 37m of approved Act 14 November 2003.

⁸ There are known numerous actions, petitions etc. trying to prove that A-1 motorways is more important for Poland than A-2. In the opinion of authors of the paper, these two motorways have a complementary character. It is important that until 2013 they should be constructed without gaps, irrespective of sequence and type of formal and legal solution, which will be implemented (concession or traditional system).

change in the spatial structure of road network. Even if the chance will appear, the logical necessity is the creation both North-South and West-East motorways links, which will cross in the centre of the country in the region of big agglomerations. The location of Lodz and Warsaw in the central area of Poland should rather favour the intensity of economic growth of the region, than cause inconveniences for the cities and their citizens.

So far, many agglomerations in the European Union made an attempt to stimulate economic growth on the base of geopolitical and infrastructure advantages resulting from the nearness or crossing important arterial routes and historical directions of international trade. Similarly like in Germany, France, Italy or UK, also in Poland, spontaneously it appeared more and more logistic centres (Wroclaw, Poznan, Gdansk, Malaszewicze, Katowice, Cracow, Tarnow, and others)⁹. The drawback of these multifunctional and multimodal centres in Poland is the lack of good quality of road infrastructure, which enabled to operate in the area within more than 200 km.

The analysis of world and European experiences of the past fifteen years points out that there is no alternative for the system based mainly on traditional budget funds for transport infrastructure investments. It can be observed that, since 1997, private sector has not been notably interested in transport infrastructure investments, what has been caused, among other things, by the breakdown of Mexican programme of paid motorways construction, difficulties of motorway enterprises in France, as well as legal obstacles in initiation of other projects financed by private capital. But, of course, on the other hand, public subsidies are always connected with a high risk of wastage of public funds. Globally they amounted to ca. 2,4-3,2% of GDP in the world and 75% of total value has been addressed to agriculture sector.¹⁰

In the macroeconomic assessment of motorways construction in Poland, it is a crucial point to notice that macroeconomic effects in monetary value will grow progressively depending on the advance of covering the country by necessary network of motorways. It does not matter to mean to build a separate section or e.g. „star network” within the Lodz region. The meaningful effect can be achieved only if all agglomerations of the country will be connected by motorways links with themselves and with important centres abroad. Only then, it will appear a new quality in the effectiveness of production mean in the economy and new possibilities of domination on the sale market. These effects have a forecasting character but with relatively small margin of the mistake, because they can be estimated on the base of reliable data, economic cause and effect connections.

Macroeconomic effects of creation of the whole motorways network in Poland consist in forming new centres of economic development, increasing role of existing centres, reducing costs of logistic in the enterprise, decreasing traffic in local and regional roads, enabling development of short sea shipping, and stimulating activity of maritime ports of

⁹ M.Kruszewska: Nie ma jak centrum. “Businessman” 2003, 3rd of December.

¹⁰ E.Molnar: Tendences du financement des investissements dans les transports: passé, présent et avenir. In: Cinquante ans de politique des transports 1953-2003. CEMT, Paris 2003.

Gdansk and Gdynia. Thanks to new network, there will be formed new cooperation and logistic layouts in Europe without border, and will be generated new traffic flows.

It can be divided, firstly - effects common for the whole network and secondly - individual effects resulting from operation of specific motorway's sections. Very often, both Polish and EU politicians have excessively exposed these effects generating by particular segments of the network. The most important macroeconomic effect of A-1, specific for this motorways, is forming new significant economic arrangement by connecting Baltic and Central European centres. Relatively advanced in realisation, A-4 motorway connects the most developed industrial centres in Poland. The advantage of A-2 motorway is a location on one of the most important transit route in Europe-Asia continents.

In present condition of labour market in Poland, one of the most desirable short-term effect of realising the programme of motorways construction concerns reduction of unemployment. But one can not be expected that radically the situation will be improved¹¹, because the scale of investment activity in the range of infrastructure is incomparably lower than within industry or service sectors. The realisation of Polish motorway programme in the years 2004-2013 should bring additional employment of about 52 thousand persons annually (see table 3). The number was estimated by the author, taking into consideration observed past practice, which proved that 1 km of motorway construction generated additional employment of ca. 200 persons annually¹².

Table 3 Quantity of employment in motorways construction in Poland (in persons)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Length of motorways under construction (in km)	8.6	24	71.4	71.4	162.9	259.7	168.9	237.7	122.8	105.5	87.0	67.0	67.0	56.7
Employment (number of persons per year)	1720	4800	14280	14280	32580	51940	33780	47540	24560	21100	17400	13400	13400	11340

Source: Own calculations on the base of Programme of Motorways Construction in Poland. GDDKiA (2003). <http://www.gddkia.gov.pl/html/pba2003.pl.htm>

In the scope of an assessment of motorways' impact on operational conditions of road carriers and logistic operators, the principal issue of changing value of production and lowering costs of activities (excluding paid motorways), has to be pointed out. The decrease of logistic operators' costs will have a positive impact on the scale of activities, amount of sale market, number of workplaces and economic growth in the whole country. Positive effects of new motorways network will be the easier terms of operation for transport, industry and service enterprises. Approximately 50% of existing enterprises in Poland are located in the area of 50 km in each side of the future motorways. Moreover, it has to be added that efficient arterial roads will favour radically the increase of productivity of the maritime ports system, by shortening period of stay and increasing attractiveness of ferry connections.

¹¹ According to Central Statistical Office data, the unemployment rate at the end of 2003 amounted to 18,0% (<http://www.stat.gov.pl>).

¹² SPO-Transport. Ministry of Infrastructure. Warsaw, 17.10.2003, p. 95.

In the future, the operation of new motorways will cause some changes of location of economic activity, social layout and traffic flows. If three planned motorways will be taken into account, following results can be cited (see table 4), considering investment expenditures and generated additional value of transport service.

Table 4 Comparison of economic effects of 150 km of A-1 motorway, A-2, A-4 motorway and rail line (for 2010)

Type of the network – effect of investment in 2010	% of goods traffic	% of passenger traffic	Annual growth of goods transport service value in million PLN	Annual growth of pass. transport service value in million PLN	Total growth of transport service value in million PLN	Investment expenditures in million PLN	Ratio of annual growth of transport service to investment expenditures
Rail 2-lines link, electrified, increase of speed from 70 to 160 km/h	70	30	405	79	484	2 250	0.21
Motorway A-1: 2 x 2 traffic lanes, (instead of national road) Gdansk-Torun	30	70	739	253	992	3 000	0.33
Motorway A2 and A4: 2 x 2 traffic lanes (instead of national road)	30	70	887	304	1 190	3 750	0.32

Source: Own calculations on the base of statistics of Central Statistical Office and Governmental Programme of Motorways Construction.

Data presented in Table 4 proves that 150 km of motorways section of A-1 requires the expenditure on the level of 3 billion PLN, and guarantees after 2010 additional value of transport services of ca. 992 million PLN annually, while similar lengths of A-2 and A-4 motorways requires (on the average) higher expenditures (3,75 billion PLN), and guarantees little more additional value of production (1,2 billion PLN annually) Completely incomparable is the effectiveness of investments within the length of 150 km of rail 2-lines rail link.

The impact of new motorways in Poland on GDP growth can be only roughly estimated, because the level of GDP depends on productivity of enterprises and labour efficiency, as well as innovative solutions in industry and services, an access to international markets, and some more factors. The motorways impact on GDP have been estimated by taking into account number of citizens in the area of 50 km from two sides of motorways, as well as GDP per 1 citizen in specific voivodships (See table 5).

Table 5 Impact of motorways on GDP in regions adherent to the motorways

	km	Population in the area of motorways 2x50 km (thousand persons)	GDP in the area of motorway 2x50 km in million PLN	Persons per 1 km of motorway	GDP in million PLN per 1 km of motorway	GDP growth 2003-2010 in million PLN per 1 km
A-1	565	11187.9	179852.4	19802	318	2.2
A-2	441	7392.8	134484.1	16764	305	2.1
A-4	545	10751.5	169628.0	19728	311	2.2
TOTAL	1551	29332.3	483964.5	18912	312	2.2

Source: Own calculations (J.Burniewicz, 2004)

It should be remarked that construction of motorways does not contribute to increasing dynamism of economic growth in Poland. In order to achieve in 2020 the rate of growth on the level of 4-6% annually, it is necessary to strengthen domestic market and foreign trade. Taking into consideration predicted increase of transport of exported and imported goods from 38 to 157-178¹³ million tonnes, one can foresee a threat that of lack of motorways network can be an imported obstacle of international exchange and economic expansion.

5. Evolution of financing conceptions of motorways construction in Poland

Until 1993 the only existing system of motorways financing in the scope of construction and modernisation had been traditional solutions based on budget funds. While approving programme of motorways construction in 1993, the government assumed that the state budget would be able to cover only 10-15% of total costs of investments, i.e. costs of land purchasing and some preparation works¹⁴. Moreover, it was assumed that ca. 5% of total expenditure would be covered by fees collected from foreign road transport users operated in Poland. Remaining financial means should have derived from bank credits (55%), especially EBRD (funds raised also by private concessionaires) and 25% of public bonds. In reality it appeared that in the years 1994-2001 the share of private concessionaires had been minimal.

The trial of diversification of financial sources was the formation of National Motorways Fund, which obtained competencies in the scope of applying for financing in following sources:

1. loans from international financial institutions,
2. revenues from vignettes sell,
3. emission of bonds, secured by replacing future ownership rights or state budget shares,
4. emission of bonds, guaranteed by the state,
5. secure instruments concerning future revenues (e.g. from vignette sell),
6. sell of property assigned by the state treasury.

Afterwards it was planned to replace toll motorways by the vignette system, which by government's opinion has following advantages:

1. possibility of receiving sources in short time,
2. enlargement of foreigners contribution in financing programme of motorways construction,
3. fall of average fare per 1 km of motorway in long-term,
4. abandonment of necessity of subordination of the network layout by the interests of concessionaires,

¹³ J.Burnewicz: Forecast of transport demand in Poland up to 2013 and 2020 prepared for the Ministry of Infrastructure. Uniwersytet Gdanski, Sopot 2004.

¹⁴ Programme of Motorways Construction. Part II – Financing of motorways. Ministry of Transport and Maritime Economy. Warsaw, July 1993.

5. exclusion of harmful impact of paid motorways on alternative roads,
6. possibility of construction of motorways and expressways in the regions important from economic and social point of view, even if traffic flows are lower,
7. elimination of high transaction costs generating at toll roads.

Vignettes were assumed as one of the most important revenues' source in budget of motorways construction in the years 2002-2005 (see table 6).

Table 6 Estimated revenues and share of different sources in financing Programme of Motorways Construction in 2002.

Sources of financing	Means of financing in different years (in million PLN)				Total 2002 – 2005
	2002	2003	2004	2005	
Excise	1 770	1 900	2 000	2 100	7 770
Other budget means	130	150	150	150	580
Vignettes	500	2 000	2 100	2 200	6 800
International financial institutions	880	1 300	1 750	1 600	5 530
ISPA	250	600	680	270	1 800
Cohesion fund			2 400	3 000	5 400
Private means of concessionaires	500	600	900	1 600	3 600
Other means	70	1 550	620	3 080	5 320
Total financial means	4 100	8 100	10 600	14 000	36 800

Source: Infrastructure – key to development. Annex to the Economic Strategy of the Government SLD - UP – PSL. Enterprise – Development – Labour, approved by the Council of Ministers on 29th of January 2002.

Works on the project of vignette act were stopped in spring 2003, because it was noticed, that the idea of vignettes was inconsistent with Polish constitution and EU regulations, and moreover, that balance of costs and benefits of implementation this solution was negative. More detailed calculations proved that annual revenues would never obtain the level of 2200 million PLN, but only 1200 million PLN, what would not be sufficient to cover compensations for private concessionaires for their losing revenues.

Table 7 State budget expenditures for transport infrastructure in Poland in the years 1999-2003

Type of expenditure	1999	2000	2001	2002	2003
Railway infrastructure	365.4	468.5	381.7	156.2	190.4
Road infrastructure (government financing)	1389.5	1684.2	1933.1	1767.4	1771.9
Road infrastructure (self-government local financing)	2220.3	2410.3	2873	2567.5	2657.9
Motorways construction	206.2	110.0	50.0	131.0	85.0
Border crossings	115.7	96.8	58.1	8.9	26.8
Reconstruction of roads and bridges	66.5	92.2	126.8		
Investments of Urząd Morski and PRO (seaports)	15.0	31.6	38.1	27.2	21.6
Other (local and urban)			135.2	91.0	
TOTAL in million PLN	4378.6	4893.6	5596	4749.2	4753.6
TOTAL in million EUR (according to National Bank of Poland exchange rate)	1035.9	1220.0	1525.4	1236.1	1250.9

Source: Own calculation on the base of annexes to the budget acts 1999-2003 and finance statements of Ministry of Finance on the realisation of the state budget in previous year.

The latest proposal in financing Polish motorways has been the fuel charge introduced in 2004, on the level of 105 PLN per 1 ton of fuel, valorised annually according to the rate of inflation. Taking into account the amount of fuels sold in 2002 (13,7 million tonnes), the total revenue can be estimated at the level of 1437 million PLN (ca. 319 million €). It is a very meaningful amount in the state budget, if we look at public expenditures for motorways construction in the past (see table 7).

6. The role of EU funds in realisation of Polish programme of motorways construction

Polish membership in the EU since May 2004 radically increased the amount of financial means available for realising the programme of motorways construction in Poland, though experts from the European Commissions sought at forcing priority for investments in railway network.

According to the settlement of July 2004¹⁵, the amount of EU assistance in the years 2004-2006 concerning realisation of investments in the range of three programmes (established especially for this purpose): A. Sectoral Operational Programme – Transport, B. Strategy of Use Cohesion Fund in Transport and C. Integrated Programme of Regional Development will amount to 4236,1 million €. Additionally it is expected to involve 692,3 million € of the state budget means, 504,3 million € of self-governments, and 13,5 million € of private investors' means. In the aggregate it will amount to 5,4 billion €.

The strategy of taking advantages from structural funds and Cohesion Fund in transport sector should guarantee positive economic, social and ecological effects (if the financial means will be used in efficient way¹⁶). Moreover, the strategy assumes to realise the conception which is coherent internally and coherent with the EU transport system. Then, within SPO-T programme, such initiatives like concentration of investment in the transport corridors, are treated preferentially.

For the sake of weak competitiveness of Polish economy, and low level of GPP per citizen in relation to the average indicator of the EU, in the years 2004-2006 all Polish voivodships have been classified to area of Objective 1 of the structural policy of the EU¹⁷. Financial means from ERDF in transport sector will be distributed in Poland on the base of two crucial documents, i.e. Sectoral Operational Programme – Transport and Integrated Programme of Regional Development.

¹⁵ 28th of July 2004 the Committee of Monitoring ZPORR approved final version of the supplement to the programme and assumed an obligation towards European Commission to realise projects resulting in substantial economic effect.

¹⁶ The amount of granted financial means does not equal receiving funds, since the money are transferred only to realizable projects, which meet specified criteria.

¹⁷ In weaker developed areas, the investments stimulating development of economic potential (including investment within TEN, telecommunication and energy networks) are going to be realised.

Table 8 Synthetic table of co-financing of transport projects in the years 2004-2006 by use of structural funds of the EU, in million €, prices of 2004

Activity	EU funds	State budget	Self-governments	Private means	TOTAL public	TOTAL public and private	Expenditure per 1 km in mln EUR	Indicator of a product in km
I. PROJECTS OF SECTORAL OPERATIONAL PROGRAMME – TRANSPORT - SPOT (ERDF)								
1.1.1. Railway line Warsaw-Lodz	231.5	77.1	0.0	0.0	308.6	308.6	3.0	102.1
1.1.2. Passenger railway fleet	51.1	17.1	0.0	0.0	68.2	68.2		30
1.2. Infrastructure access to seaports	119.8	23.7	16.2	0.0	159.7	159.7		NA
1.3.1. Logistic centres	13.0	4.3	0.0	6.5	17.3	23.8		1.
1.3.2. Multimodal terminals	10.7	3.6	0.0	5.4	14.3	19.7		5.
2.1.1. Motorways (including 2 Skierniewice-Warsaw)	299.8	100.3	0.0	0.0	400.1	400.1	5.5	72.6
2.1.2. Expressways (including S22 Elblag-Grzechotki)	56.8	18.9	0.0	0.0	75.7	75.7	1.5	51
2.1.3. Rebuilding of national roads and ring-roads	190.7	63.6	0.0	0.0	254.2	254.2	3.0	84.3
2.2. Modernisation of national roads in poviats	164.0	0.0	54.7	0.0	218.7	218.7	3.5	62.5
2.3. Road safety	17.0	5.7	0.0	0.0	22.7	22.7		NA
3. Technical assistance	9.0	3.0	0.0		12.0	12.0		NA
TOTAL SPOT	1163.4	317.3	70.9	11.9	1551.5	1563.4		
II. TRANSPORT PROJECTS FINANCED FROM COHESION FUND								
1. Modernisation of railway lines	895.4	158.0	0.0	0.0	1053.4	1053.4	2.4	434.5
2. Motorways	934.2	165.2	0.0	0.0	1099.4	1099.4	6.0	182
3. Expressways	179.7	30.9	0.0	0.0	210.6	210.6	7.0	30
4. Rebuilding of national roads	80.0	14.7	0.0	0.0	94.7	94.7	1.0	95
TOTAL COHESION FUND	2089.3	368.8	0.0	0.0	2458.1	2458.1		
III. INTEGRATED PROJECTS OF OPERATIONAL PROGRAMME ZPORR (ERDF)								
1.1. Modernisation and extension of regional systems	768.6	0.0	256.2	1.0	1024.8	1025.8	5.2	199
1.6. Public transport in agglomerations above 500 thousand citizens.	167.9	0.0	167.9	0.0	335.8	335.8	14.6	23
3.1. Rural areas – construction and modernisation of gmina and poviat roads of local importance	46.9	6.3	9.4	0.6	62.5	63.1	0.3	215
TOTAL ZPORR	983.4	6.3	433.5	1.6	1423.1	1424.7		
TOTAL	4236.1	692.3	504.3	13.5	5432.8	5446.3		

Source: Documents of 20 April 2004. Strategy of Use of Cohesion Fund, Sectoral Operational Programme – Transport, Integrated Programme of Regional Development, with supplements

This year occurs to be a turning point in the intensity of financing in Polish transport infrastructure: the annual level of expenditure will rise from 1,5 billion € in 2002 up to 3.5 € in 2006, which means the increase of transport infrastructure investments in GDP up to 1.8%. For many years this level seemed to be unattainable. Now there exist real chances for taking maximal advantages from EU financial assistance, also by reason of preparing high quality three structural programmes.

Thanks to EU co-financing, until the end of 2008, it will be possible to build 254.6 km of motorways and 81 km of expressways, modernise 241.8 km of national roads and 437 km of poviat and gmina roads, as well to modernise 536.6 k of railway lines. In spite of this extended investments, after 2008 the density of Polish road network will only slightly

improve in relation to the EU average. But the situation should be significantly ameliorated in some transit connections and congested segments of roads in the areas of agglomerations and other cities.

7. Conclusions

Economic and social development of Poland during over a dozen years in the past, should result in modernisation of transport infrastructure, especially in some regions, characterised by, firstly - scarcity of infrastructure network, or secondly – by high demand for new investments. These needs have been admittedly identified with motorways. The growth of road traffic, resulting from increased mobility of citizens and boom of private motorisation as well as dynamic development of freight transport, in turn generates an increase of demand for high quality road infrastructure objects. Only such type of infrastructure can ensure short travel time and high safety level. Moreover, the transformation processes favour development of new financing instruments of infrastructure investments, including involvement of private capital, concession system, public and private partnership. In post-socialist conditions, these new forms of financing should stimulate investments in the domain of motorways. Polish practice indicated that the favoured conditions did not mean a simply shift towards dynamic evolution of motorways investments. This statement is proved by actual map of motorway „network” in the country. In Poland, some legal, social and financing barriers have blocked the realisation of motorways investments, especially in the North-South axis. Nevertheless, hopefully present solutions and new possibilities as well as potential of EU assistance can stimulate further acceleration of realising motorways programme. The probable scenario can be predicted that at least from the point of view of domestic transport users, the road network conditions will significantly improve during several years in the future.

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