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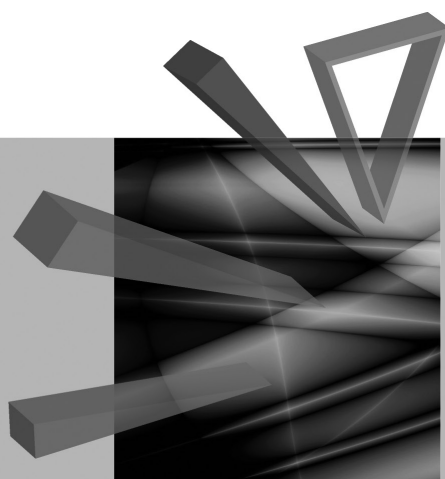
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SUSTAINABLE TRANSPORT DEVELOPMENT PREREQUISITES IN SELECTED POLISH REGIONS

Summary: An analysis of implemented policy and planning requires the guidance of accurate information in order to facilitate making strategic decisions. This is particularly important for sustainable planning, which takes into account diverse, indirect and long-term impacts. Also, there is a need to integrate closer the processes of extending the necessary transport infrastructure with the rule of balancing development by seeking selective and optimal solutions at the level of regional and at local level. Based on the available strategic documents and statistical data 2004–2010 regarding transport indicators, the paper presents the sustainable transport development prerequisites based on selected regions representing northern (Pomorskie), eastern (Podlaskie), southern (Małopolskie), western (Wielkopolskie) and central (Mazowieckie) parts of Poland.

Keywords: sustainable transport indicators, EU, Polish regions.

1. Introduction

Sustainable transportation indicators are an important tool for better transportation planning. There is currently no standard set of sustainable transportation indicators. A variety of indicators are used, some of which are particularly appropriate and useful for planning and policy analysis. It is important to establish standardized sets of sustainable transportation indicators and to improve the collection of transportation statistics, expanding these efforts to reflect key economic, social and environmental impacts [Borys 2008; Litman 2008, p. 11]. Efficient and affordable transport systems are necessary for poverty alleviation and the need to mitigate adverse externalities to health and the environment. From an environmental and social point of view, the failure to unhitch growth in transport from growth in GDP is an extremely worrying tendency. Based on the available strategic documents and chosen statistical data (2004–2010), the paper presents the sustainable transport development prerequisites in Poland using the example of selected regions in the

context of the sustainable development paradigm and sustainable transport policy guidelines in the EU policy. The analysis takes into consideration regions representing northern (Pomorskie), eastern (Podlaskie), southern (Małopolskie), western (Wielkopolskie) and central (Mazowieckie) parts of Poland.

2. Sustainable development paradigm and sustainable transport in the EU policy

The idea of sustainable development is contained within two key concepts [WCED 1987, p. 43]:

- the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given;
- the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

It is possible to graphically represent (see Figure 1) the achievement of sustainable development by the simultaneous coexistence of three capitals/capacities: environmental (natural), economic and social. There exist numerous other sustainability development models, taking into account four capitals: natural, social, economic and human [see more: Medhurst 2003, p. 4; Vivien 2005].

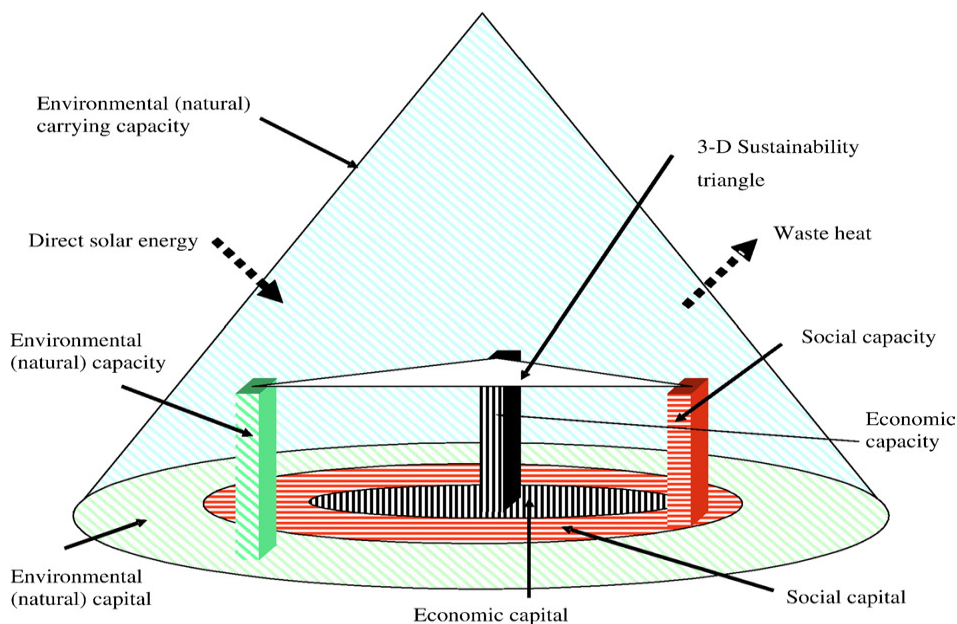


Figure 1. Sustainable Development triangle

Source: [Mauerhofer 2008, p. 497].

According to the European Council of Ministers of Transport [ECMT 2004] definition, a sustainable transport system:

- allows the basic access and development needs of individuals, companies and society to be met safely and in a manner consistent with human and ecosystem health, and promotes equity within and between successive generations;
- is affordable, operates fairly and efficiently, offers a choice of transport mode and supports a competitive economy, as well as balanced regional development;
- limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and uses non-renewable resources at or below the rates of development of renewable substitutes, while minimizing the impact on the use of land and the generation of noise.

Transportation is expected to be the major driving force behind the growing world demand for energy. It is the largest end-use of energy in developed countries and the fastest growing one in most developing countries. Furthermore, adequate, efficient, and effective transport systems are important for access to markets, employment, education and basic services critical to poverty alleviation. Current patterns of transportation development are not sustainable and may compound both environmental and health problems. Therefore, there is a need for urgent action, ranging, inter alia, from the promotion of integrated transport policies and plans, the accelerated phase-out of leaded gasoline, the promotion of voluntary guidelines and the development of partnerships at a national level for strengthening transport infrastructure, promoting and supporting the use of non-motorized transport and developing innovative mass transit schemes. International co-operation is required in order to ensure transport systems support sustainable development [WWW1].

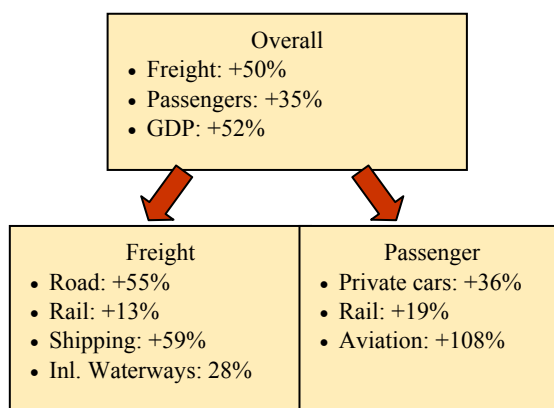


Figure 2. Most likely 2000–2020 growth in transport demand in EU27

Source: [Grzelakowski 2008].

In the EU, as a result of the currently formed modal split in the transport sector, and as predicted realistically, by 2020 there is no chance for any shift towards the more environmentally friendly modes of transport such as rail and inland waterways, reaching the set up transport policy's objective is thoroughly impossible. If this tendency continues, sustainable mobility by a still rapidly growing transport activity may even slip away [Grzelakowski 2008]. For sustainable mobility, this means disconnecting mobility from its many harmful effects for the economy, society and environment. The most likely 2000–2020 growth in transport demand in the EU27 is presented in Figure 2 [Ponthieu 2008, p. 10].

Table 1. Ten goals for a competitive and resource efficient transport system: benchmarks for achieving the 60% GHG emission reduction target

I. Developing and deploying new and sustainable fuels and propulsion systems	II. Optimising the performance of multimodal logistic chains, including by making greater use of more energy-efficient modes	III. Increasing the efficiency of transport and of infrastructure use with information systems and market-based incentives
Halve the use of 'conventionally-fuelled' cars in urban transport by 2030; phase them out in cities by 2050; achieve essentially CO ₂ -free city logistics in major urban centres by 2030.	30% of road freight over 300 km should shift to other modes such as rail or waterborne transport by 2030, and more than 50% by 2050, facilitated by efficient and green freight corridors. To meet this goal will also require appropriate infrastructure to be developed.	Deployment of the modernised air traffic management infrastructure (SESAR) in Europe by 2020 and completion of the European Common Aviation Area. Deployment of equivalent land and waterborne transport management systems (ERTMS, ITS, SSN and LRIT, RIS). Deployment of the European Global Navigation Satellite System (Galileo).
Low-carbon sustainable fuels in aviation to reach 40% by 2050; also by 2050 reduce EU CO ₂ emissions from maritime bunker fuels by 40% (if feasible 50%).	By 2050, complete a European high-speed rail network. Triple the length of the existing high-speed rail network by 2030 and maintain a dense railway network in all Member States. By 2050 the majority of medium-distance passenger transport should go by rail.	By 2020, establish the framework for a European multimodal transport information, management and payment system.
	A fully functional and EU-wide multimodal TEN-T 'core network' by 2030, with a high quality and capacity network by 2050 and a corresponding set of information services.	By 2050, move close to zero fatalities in road transport. In line with this goal, the EU aims at halving road casualties by 2020. Make sure that the EU is a world leader in safety and security of transport in all modes of transport.
	By 2050, connect all core network airports to the rail network, preferably high-speed; ensure that all core seaports are sufficiently connected to the rail freight and, where possible, inland waterway system.	Move towards full application of "user pays" and "polluter pays" principles and private sector engagement to eliminate distortions, including harmful subsidies, generate revenues and ensure financing for future transport investments.

Source: [White Paper 2011].

Recently, the EU proposed a new document: Europe 2020 Strategy [Europe 2020... 2010]. The Commission has identified three key drivers for growth, to be implemented through concrete actions at EU and national levels: smart growth (fostering knowledge, innovation, education and digital society), sustainable growth (making the production more resource efficient while boosting the competitiveness) and inclusive growth (raising participation in the labour market, the acquisition of skills and the fight against poverty). In order to update the EU transport policy, the European Commission published a new document: White Paper 'Roadmap to a Single European Transport Area – towards a competitive and resource efficient transport system' [White Paper 2011] where a set of very ambitious goals have been presented to be achieved by 2050 (see Table 1).

As one can see, the EU is one of the most active promoters of the idea of sustainable development. Thus, in its transport policy the EU aims at changing the demand pattern by shifting potential demand from the road transport sector towards rail, inland waterway and sea transport – short-distance shipping as well as promoting combined transport and collective public transport. Such solutions are more environmentally friendly, thus helping pursue sustainable development. The above presented goals will be very difficult to achieve, especially for such new EU members as Poland. It is necessary to adopt a high quality sustainable transport indicators monitoring system in order to better plan and manage the transport development [Borys 2009; Nicolas 2010].

For a comprehensive and balanced analysis, indicator sets should include indicators from each of the major categories of issues, such as those listed in Table 2. For example, it is important to have indicators of transport cost efficiency (economic), equity and livability (social), and pollution emissions (environmental).

Table 2. Sustainable transportation issues*

Economic	Social	Environmental
Accessibility quality	Equity/fairness	Air pollution
Traffic congestion	Impacts on mobility disadvantaged	Climate change
Infrastructure costs	Affordability	Noise pollution
Consumer costs	Human health impacts	Water pollution
Mobility barriers	Community cohesion	Hydrologic impacts
Accident damages	Community livability	Habitat and ecological degradation
DNRR	Aesthetics	DNRR

* This table lists various impacts which should be reflected, as much as feasible, in sustainable transportation indicator sets. (DNRR = Depletion of Non-Renewable Resources).

Source: [Litman, Burwell 2006, p. 335].

These are examples of sustainable transportation issues, but the table is not intended to be comprehensive. Some indicators reflect multiple impact categories; for

example, traffic accidents impose economic costs from damage and reduced productivity, and social costs from pain and reduced quality of life. Fuel consumption can be a useful indicator because it reflects energy consumption, pollution emissions, climate change, and total vehicle travel, and to a lesser extent mileage-related impacts such as congestion and crash rates. On the other hand, it provides limited information about actual damage to the environment [Litman 2008].

3. Sustainable transport indicators in selected Polish regions

Below, some available transport indicators regarding selected Polish regions in the period 2004–2010 are presented. The following indicators have been taken into consideration:

- social: fatalities in road accidents/100 thousand inhabitants, one-way tram ticket price;
- economic: motorways in km, number of passengers in the airports, inland waterway cargo transport in thousand tons;
- environmental: railways electrified normal gauge in km, CO₂ emissions.

Figure 3 presents fatalities in road accidents/100 thousand inhabitants. Fatalities in road accidents/100 thousand Inhabitants – their number has been constantly decreasing in all the regions.

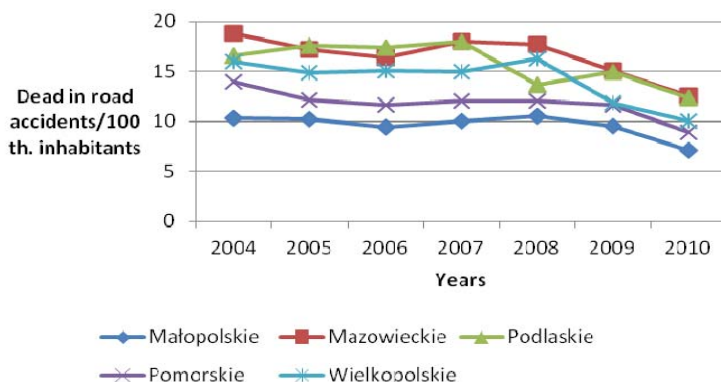


Figure 3. Fatalities in road accidents/100 thousand inhabitants in selected Polish regions (2004–2010)

Source: own elaboration based on [*Transport 2004–2010...*].

Out of the compared regions, the ‘safest’ is Małopolskie (7.1). The highest number of victims occurred in Mazowieckie and Podlaskie (12.5 and 12.3, respectively). Poland remains the country with one of the highest number of road accidents and casualties in the EU. This is due to the low quality of Polish road infrastructure and the high number of drunk drivers.

As regards one-way tram ticket price (see Figure 4), it has been only slightly increasing in most selected regions (except for the Podlaskie region where there is no tram system).

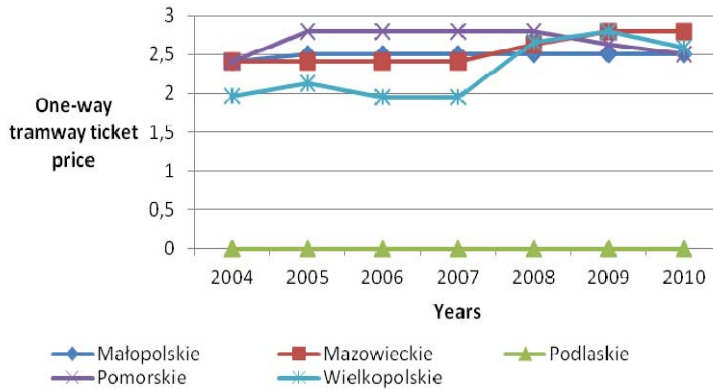


Figure 4. One-way tram ticket price in selected capital cities of the Polish regions (2004–2010)

Source: own elaboration based on [Transport 2004–2010...].

As one may see, the price has decreased in Pomorskie to 2.5 PLN. The most expensive – and therefore the least accessible – is the ticket price in Mazowieckie – 2.8 PLN. Public transport plays a major role in decongesting major regional capital cities. It should be accessible also in terms of pricing in order to allow greater mobility.

The length of motorways has been increasing, except for two regions where there have not been any highways being constructed at all (see Figure 5).

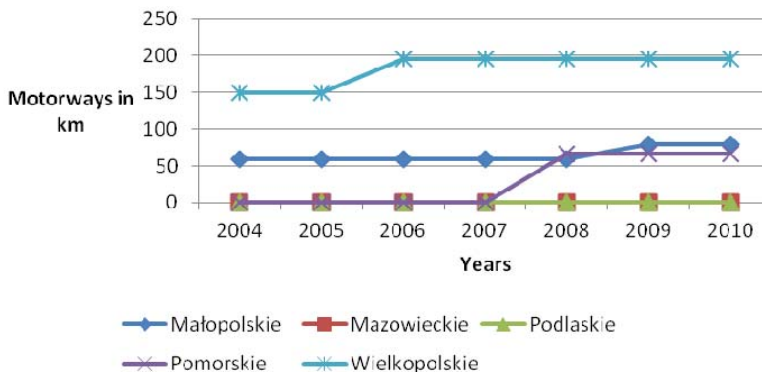


Figure 5. Motorways in km in selected Polish regions (2004–2010)

Source: own elaboration based on [Transport 2004–2010...].

The leader is the Wielkopolskie region with almost 200 km. In Pomorskie the first part of motorway A1 was opened in 2008. In two regions, Mazowieckie and Podlaskie, there was not any infrastructure of that kind in the analyzed period of time.

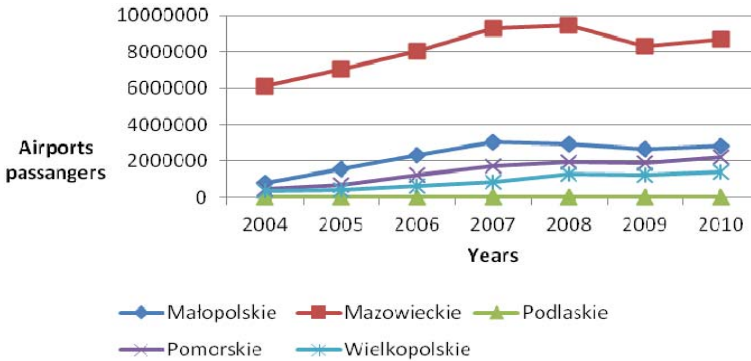


Figure 6. Number of passengers in the airports in selected Polish regions (2004–2010)

Source: own elaboration based on [Transport 2004–2010...].

As far as the number of passengers in airports is concerned, it has been increasing (especially in Mazowieckie reaching 8,689,655 passengers in 2010), except for Podlaskie where there is no airport (see Figure 6). This intensity is connected, among others, with the activity of low-cost carriers in Poland.

However, when it comes to inland waterway cargo transport, the results prove that this form of transport remains neglected, except for the Wielkopolskie region where there has been a considerable (but occasional) growth – 1812 thousand tons in 2009 (see Figure 7).

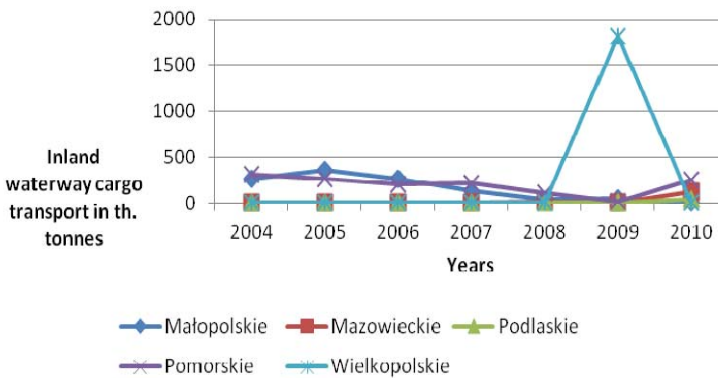


Figure 7. Inland waterway cargo transport in thousand tons in selected Polish regions (2004–2010)

Source: own elaboration based on [Transport 2004–2010...].

These results prove that the inland waterway transport plays unfortunately a minor role in reaching more sustainable development of the transport systems in the analyzed regions.

The length of electrified railways with normal gauge (see Figure 8) remained at the same level, which is also an extremely worrying tendency.

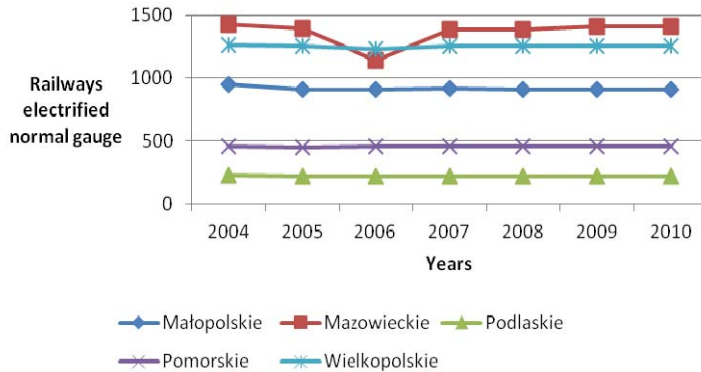


Figure 8. Railways electrified (normal gauge) in km in selected Polish regions (2004–2010)

Source: own elaboration based on [*Transport 2004–2010...*].

This environmental-friendly form of transport could have contributed more to greater sustainability. The statistics prove that the railways stagnation concerns all parts of Poland, totalling 1412 km in Mazowieckie and only 220 in Podlaskie.

CO₂ emissions have been remaining more or less at the same level, with two exceptions: in Mazowieckie their number has increased and in Małopolskie region it has slightly decreased (see Figure 9).

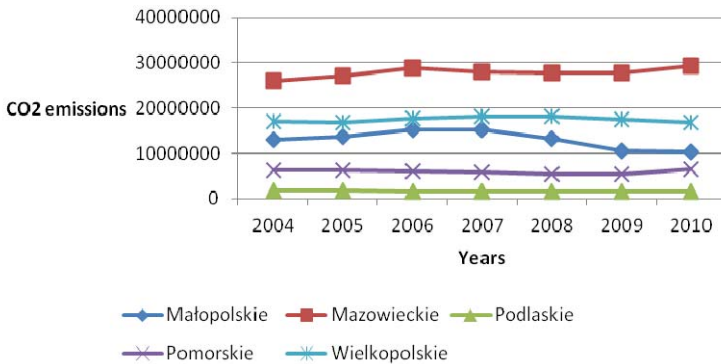


Figure 9. CO₂ emissions in selected Polish regions (2004–2010)

Source: own elaboration based on [*Transport 2004–2010...*].

4. Conclusion

Indicators are important tools for making decisions and measuring progress. The statistical data analysis regarding transport indicators in 2004–2010 of selected Polish regions confirms that the attainment of sustainable transport development is a difficult and long-lasting process. There are some optimistic signs, like in the case of the decreasing number of fatalities in road accidents. However, in the case of inland waterways and railways, the indicators show that there is not a great chance of shifting to environmental-friendly modes of transport. Taking into consideration the analyzed sustainable transport indicators, the eastern region – Podlaskie – is lagging behind the others, except for the amounts of CO₂ emissions being the lowest out of the selected regions.

Therefore the implementation of the ambitious goals presented in the updated EU White Paper seem unrealistic to achieve by 2050, unless the Polish public authorities responsible for transport investment take urgently the necessary decisions. Public authorities should support the greater use of public and non-motorized transport and promote an integrated approach to policy-making, including policies and planning for land use, infrastructure, public transport systems and goods delivery networks, with a view to providing safe, affordable and efficient transportation, increasing energy efficiency and reducing pollution, congestion and also adverse health effects. Other instruments should include the much wider application of the principle of genuine social participation in the decision-making process, in order to balance the interests of local and regional communities and their development ambitions. A further decentralisation of the state and public finance, along with a more extensive scope of decisions taken at regional level would also contribute to the harmonisation of investment activities and to facing sustainable development challenges.

Although transportation-related statistics are extensively gathered, their quality is highly variable, and even the best data are often incompatible with those from other organizations and jurisdictions. It is highly recommended to develop a research program concerning the collection, analysis and application of high quality, standardized transportation data in order to be able to provide a suitable framework for transportation planning and policy benchmarking.

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PRZESŁANKI ZRÓWNOWAŻONEGO ROZWOJU TRANSPORTU W WYBRANYCH POLSKICH REGIONACH

Streszczenie: Analiza realizowanej polityki i planowanie powinny opierać się na właściwej bazie informacyjnej ułatwiającej podejmowanie strategicznych decyzji. Jest to szczególnie istotne w przypadku planowania zrównoważonego rozwoju, gdyż należy uwzględnić różnorodne, pośrednie i długookresowe efekty. Istnieje także potrzeba większej harmonizacji procesów rozwijania niezbędnej infrastruktury transportu z zasadą równoważenia rozwoju poprzez poszukiwanie selektywnych i optymalnych rozwiązań na poziomie regionalnym i lokalnym. Celem publikacji jest przedstawienie przesłanek zrównoważonego rozwoju transportu w świetle dostępnych dokumentów i danych statystycznych za lata 2004–2010 dotyczących wybranych pięciu polskich regionów reprezentujących następujące części kraju: północną (Pomorskie), wschodnią (Podlaskie), południową (Małopolskie), zachodnią (Wielkopolskie) i środkową (Mazowieckie).

Słowa kluczowe: wskaźniki zrównoważonego transportu, UE, polskie regiony.