

THE IMPACT OF EXPRESSWAY S6 LĘBORK – TRICITY RING ROAD ON PROTECTED AND ENVIRONMENTALLY VALUABLE AREAS

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Summary. Conflict sites were identified in the study between the planned Expressway S6 Lębork – Tricity Ring Road and protected and environmentally valuable areas. In order to identify these points, map layers showing the route options of the planned expressway were superimposed on a map showing Natura 2000 area boundaries and other forms of nature conservation. The degree of conflict with protected and environmentally valuable areas was estimated for each route option. The potential conflicts of the planned expressway with protected areas (National and Landscape Parks and their buffer zones, Natura 2000 areas, areas of protected landscape, forest areas and river valleys) are shown on a map.

Key words: expressways, protected areas, conflicts

INTRODUCTION

Due to its location in central Europe, Poland is crossed by international traffic routes linking the east with the west and the north with the south of the continent. Such a location presents an opportunity for growth but also gives rise to a number of threats. Numerous transit roads encroach on environmentally valuable areas as they pass through forests and marshes and intersect animal migration routes and ecological corridors. This has a deleterious effect on the natural environment, leading to its degradation. Over the next few years, several hundred kilometres of new roads and railways are due to be built. Traffic routes, if poorly designed and built, can become a real barrier not only to animals, but also to plants and fungi [Chwiałkowski 2007]. Therefore, every possible effort should be made to ensure that the modern roads connect instead of dividing.

The objective of the study was to determine the usefulness of the method of assessing the degree of conflict between road projects and the environment for

the selection of the optimum route option, using the example of the Lębork – Tricity Ring Road Expressway S6.

MATERIALS AND METHODS

The following digital vector maps with a resolution corresponding to the scale of 1:50 000 were used as input material for analysing the impact of the planned Expressway S6 Lębork – Tricity Ring Road on protected and environmentally valuable areas:

- map showing the route options of the planned road – the map was prepared as part of the design and was used courtesy of the General Directorate of National Roads and Motorways, Gdańsk Branch.

- maps showing the boundaries of Natura 2000 areas and national forms of nature conservation.

In order to identify the conflict points, MapInfo 8.5 software was used to superimpose map layers showing the route options of the planned expressway on maps showing Natura 2000 area boundaries and other national forms of nature conservation. The lengths of individual stretches of the expressway in conflict with various categories of protected areas were determined by means of cartometric analysis. The character of the conflicts was also determined: direct conflict (a protected area is dissected by the road) or indirect conflict (the road runs in the vicinity of a protected area).

Each protected and environmentally valuable area identified was ranked (Table 1) and the degree of conflict with the planned expressway was estimated [Jędrzejewski 2007] according to the following formula,

$$\sum (\text{DOCH}_i \cdot \text{ROCH}_i)$$

where:

DOCH_i – length of a road stretch dissecting a protected area

ROCH_i – rank of a protected area

Table 1. Rank of protected and environmentally valuable areas [Jędrzejewski 2007]

Category of a protected area	Rank (ROCH)
Natura 2000 Areas: Habitats Directive	4
Natura 2000 Areas: Birds Directive	4
Landscape parks	3
Areas of protected landscape	2
Landscape park buffer zones	1.5
Forest areas outside protected areas	1
River valleys outside protected areas (a 0.5 km buffer)	1

The degree of conflict of the route options of the planned expressway with protected and environmentally valuable areas (per 1 km of road) was determined

on a scale from zero to three, where zero represents the least conflicting and three the most conflicting stretch.

RESULTS

Natura 2000 Areas, pursuant to Article 25 of the Environmental Protection Act [Dz. U. z 2004 r., Nr 92, poz. 880], encompass special protection areas for birds, special areas of conservation (habitats), and sites of Community importance. Pursuant to Article 33 of the above act, it is forbidden to take any actions that might significantly deteriorate the condition of environmental habitats as well as habitats of plants and animals, or have a significant deleterious effect on the species protected within a Natura 2000 area.

The planned S6 Expressway Łębork – Tricity Ring Road bypasses the designated or planned Natura 2000 areas. The closest Special Protection Area for birds is the „Lasy Łęborskie” area (PLB 220006), located 230 m to 1.2 km away from the expressway, depending on the route option. Another one, „Puszcza Darżłubska” (PLB 220007), is located further away (11.4 km). As regards Special Areas of Conservation (submitted by Poland and approved by the European Commission), the „Dolina Górnej Łeby” area (PLH 220006) is the closest to the planned expressway (2.3 km), while the „Mawra Bagno-Biała” area (PLH 220016) is 6 km away. The „Paraszyńskie Buczyny” area (PLH 220023), proposed by NGOS as part of the Shadow List, is located 1 km away from the planned expressway.

Landscape parks encompass areas whose environmental, historical, cultural and landscape value is protected and popularised according to the principles of sustainable development (Article 16 of the Environmental Protection Act). The planned expressway runs from 50 to 500 from the border of the Trójmiejski Landscape Park (19 930 ha) which encompasses the boundary zone of the Kashubian Lake District with its varied landforms and numerous watercourses. Forests account for more than 90% of the Park’s area. Beech forests (*Luzulo pilosae-Fagetum* and *Melico-Fagetum*), beech and oak forests, and multi-species forests predominate in the Park. Alder and ash riparian forests occur in the river valleys. Rare plant and animal species are under protection there. The Park’s most floristically valuable sites include two Lobelia lakes Pałsznik and Wygoda, located within the „Pełcznica” nature reserve.

Areas of protected landscape comprise areas protected for their distinctive landscape and varied ecosystems, areas valued for their capacity to satisfy tourism and recreation needs or for their role as ecological corridors (Act of 16 April 2004 on Nature Conservation, Article 23, par. 1).

Areas of protected landscape are a relatively lax form of environmental protection, focused mainly on recreation activity. Economic activity is subject to minor restrictions such as the prohibition of carrying in objects harmful to the environment and of damaging the natural environment.

The S6 expressways intersects a fragment of the Łeba Urstromtal, along a stretch of 17.7 km, and moraine hills south of Lębork, along a stretch of ca. 9.5 km.

The northern option of the planned Expressway S6 Lębork – Tricity Ring Road intersects the buffer zone of the Trójmiejski Landscape Park (16.542 ha), along a stretch of 13.7 km from Szeperia to Brzozówka and along 1.2 km at the „Wielki Kack” junction. The southern option of the planned expressway intersects the buffer zone along a stretch of 8.5 km, from Szeperia to Kowalewo.

Forest areas particularly vulnerable to the adverse impact of the S6 expressway as well as lengths of „conflict stretches” are shown in Table 2.

Table 2. Lengths of road stretches (in km) in conflict with large forest complexes

Name of forest complex	Length of conflict stretch, km
Las Kębłowski	3.0
Lasy Lęborskie	0.8
Las Lubowidzki	1.5
Las Małoszycki	5.7
Las Milwiński	1.1
Las Oliwski	2.7
Las Strzebieliński	3.7
Las Wejherowski	3.0

The longest conflict stretches (3.0–5.7 km) concern four complexes:

- Las Małoszycki located south of Lębork and west of the Okalica valley,
- Las Kębłowski located between Strzebielino (Chorwatynia), Kębłowo and Luzino,
- Las Wejherowski located south of Wejherów, east of Przetoczyno, and north of Szemud, Kamień and Koleczkowo,
- Las Strzebieliński located east of the Łeby valley in Boże Pole and Paraszyno, and south of Strzebielino.

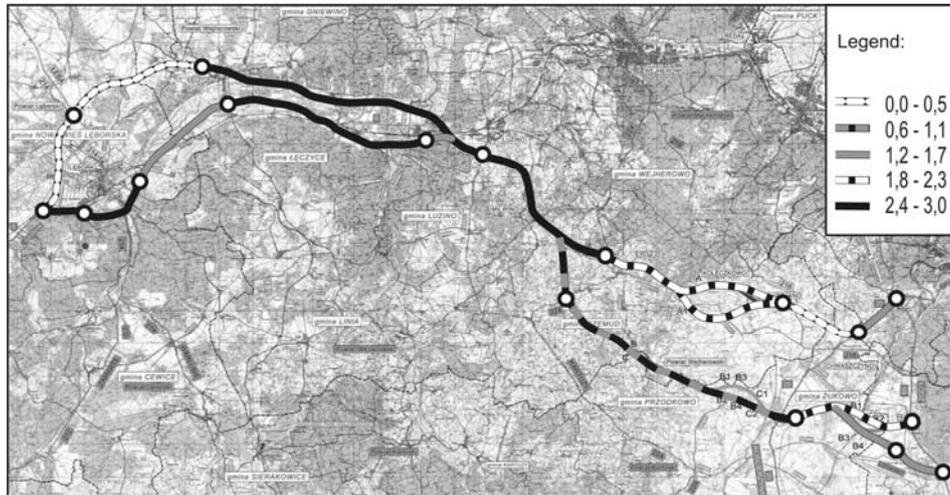
The planned expressway also conflicts with the Las Lęborski forest complex, along a stretch of ca. 0.8 km.

The other conflict areas concern smaller forest complexes, their fragments, or groves, and the total length of conflict stretches is about 10 km.

River valleys are intersected by the planned S6 expressway at ten sites, including the valleys of the Łeba and Reda rivers (each in two places). Within the catchment of the Łeba river, the expressway dissects the valleys of the Kisewa, Okalica and Węgorza. Along of the Reda river, it dissects the valley of the Bolszewka. The expressway runs for 10.5 km in the Łeba river area, and for 1.2 km in the Reda river area; the other conflict areas concern smaller watercourses.

In order to maintain the connectivity of the Natura 2000 network and preserve the key animal migration corridors from north to south and from east to west, the ecological corridors in the valleys of these rivers and watercourses should be kept passable [Pasek 2009].

The most conflict-ridden area of the planned expressway is the southern stretch of the Lębork Ring Road, from Leśnice to Mosty (Map 1).



Map 1. The degree of conflict with protected and environmentally valuable areas was estimated per 1 km of the expressway

This eight-kilometre stretch is in conflict with areas of protected landscape and large forest complexes (Las Lubowidzki, Las Małoszycki).

The 12-kilometre stretch of the expressway south of Łęczyce and Strzebielino is also characterised by a high degree of conflict with areas of protected landscape. The remaining conflict areas comprise large forest complexes (Las Strzebieliński along a stretch of 3.7 km) and river valleys (the Łeba valley along a stretch of 7.1 km). The 19.8-kilometre stretch of the expressway from north of Łęczyce to Szemud is also a conflict area. The planned expressway intersects areas of protected landscape (along 13.7 km), the buffer zone of the Trójmiejski Landscape Park (along 3.8 km), and forest complexes – in 8 places along a total of 6.7 km. Along 8.7 km, the planned expressway crosses river valleys.

The northern part of the Lębork Ring Road, from Leśnice to Łęczyce, turns out to be the least harmful for the environment. The stretch between Bojanowo and Chwaszczyno is also a non-conflict area.

CONCLUSIONS

Out of the two options of the planned expressway S6 between Leśnice and Strzebielino, the northern option should be chosen due to its lower degree of conflict with protected and environmentally valuable areas than in the case of the southern option. Conversely, of the two options of the planned expressway between Cząstkowo and Chwaszczyno, the southern option should be chosen

due to its lower degree of conflict with protected and environmentally valuable areas than in the case of the northern option.

The conflict assessment did not show clear differences between the options of the planned road between Łęczyce and Luzino. Hence, a detailed environmental impact assessment should be carried out in order to select the better option.

The presented method for the environmental impact assessment of road projects can be useful at the preliminary stage of road project planning because it enables to screen out options harmful to the environment from among a large number of options, a detailed analysis of which would be impossible or very labour-intensive, and to select the most advantageous options, for which the environmental impact assessment procedure can be continued.

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WPLYW DROGI EKSPRESOWEJ S6 LĘBORK – OBWODNICA TRÓJMIASTA NA OBSZARY CHRONIONE I PRZYRODNICZO CENNE

Streszczenie. W pracy zidentyfikowano kolizyjne miejsca projektowanej drogi ekspresowej S6 Lębork – Obwodnica Trójmiasta z obszarami chronionymi i przyrodniczo cennymi. Identyfikacji obszarów kolizyjnych dokonano przez nałożenie warstw mapy przebiegu wariantów projektowanej drogi z mapą granic obszarów Natura 2000 a także z innymi formami ochrony przyrody. Oszacowano stopień konfliktowości dla każdego wariantu projektowanej drogi z obszarami chronionymi i przyrodniczo cennymi. Potencjalne konflikty planowanej drogowej z obszarami chronionymi (Parki narodowe i krajobrazowe oraz ich otuliny, obszary Natura 2000, obszary chronionego krajobrazu, obszary leśne i doliny rzeczne) przedstawiono na mapie.

Słowa kluczowe: drogi ekspresowe, obszary chronione, konflikty