

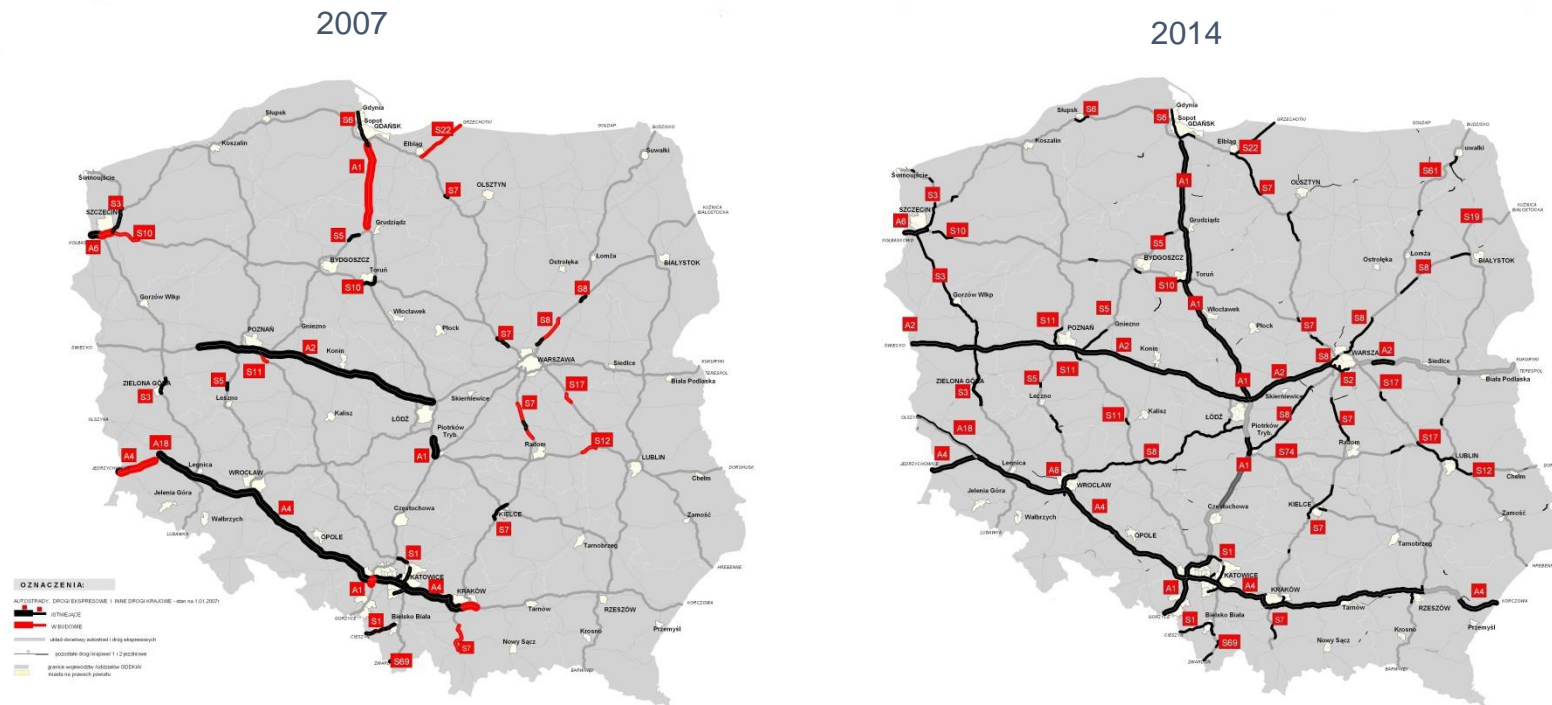
**S7 Miłomłyn-Olsztynek
major project within
programming period
between 2014 and 2020**

National road network in Poland

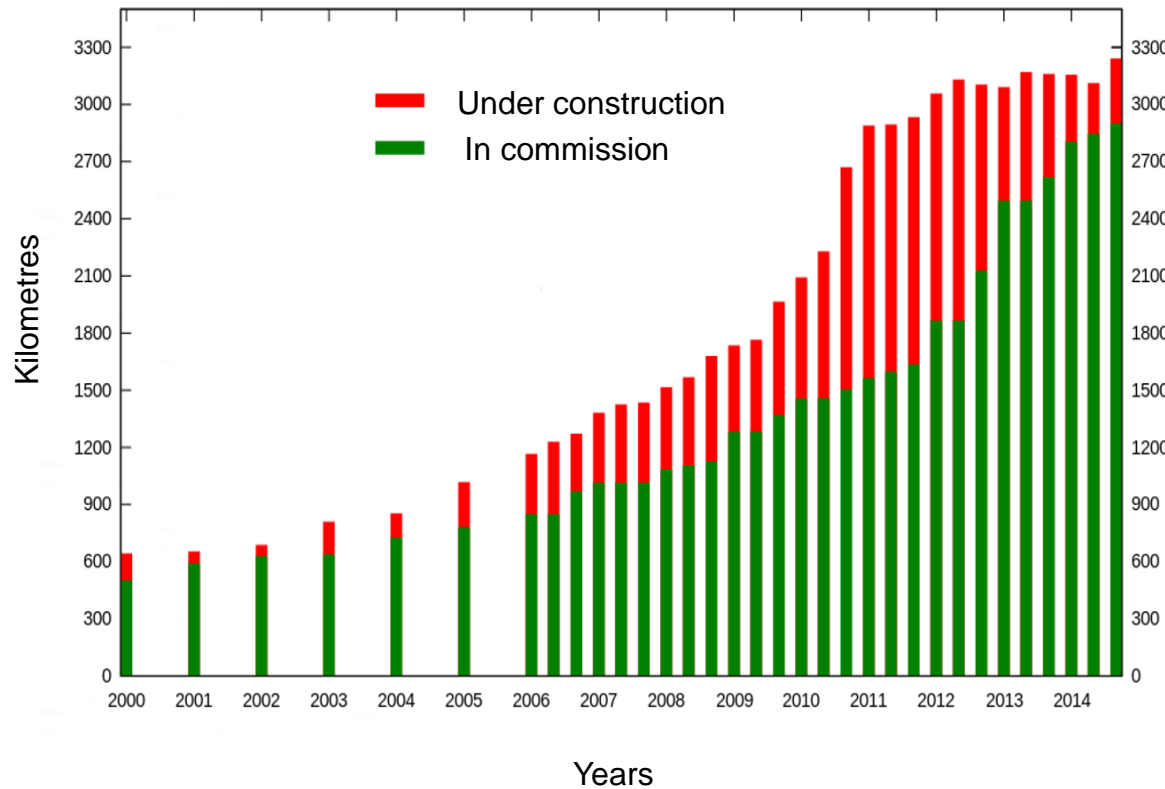
National road network in Poland is about 18 500 km:

- motorways – 1 553,2 km
- expressways – 1 433,6 km
- other roads managed by GDDKiA – about 15 500 km

Since 2007 Poland constructed 2 063,8 km of new roads



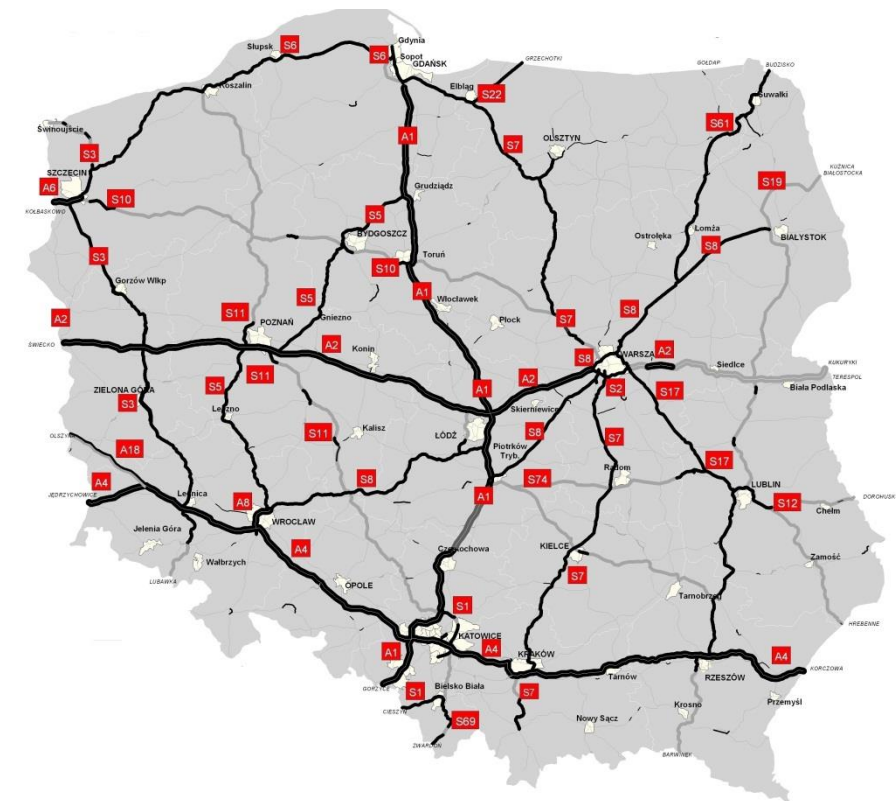
Historical data for high-class road network (since 2000):



National road network in Poland 2014-2020

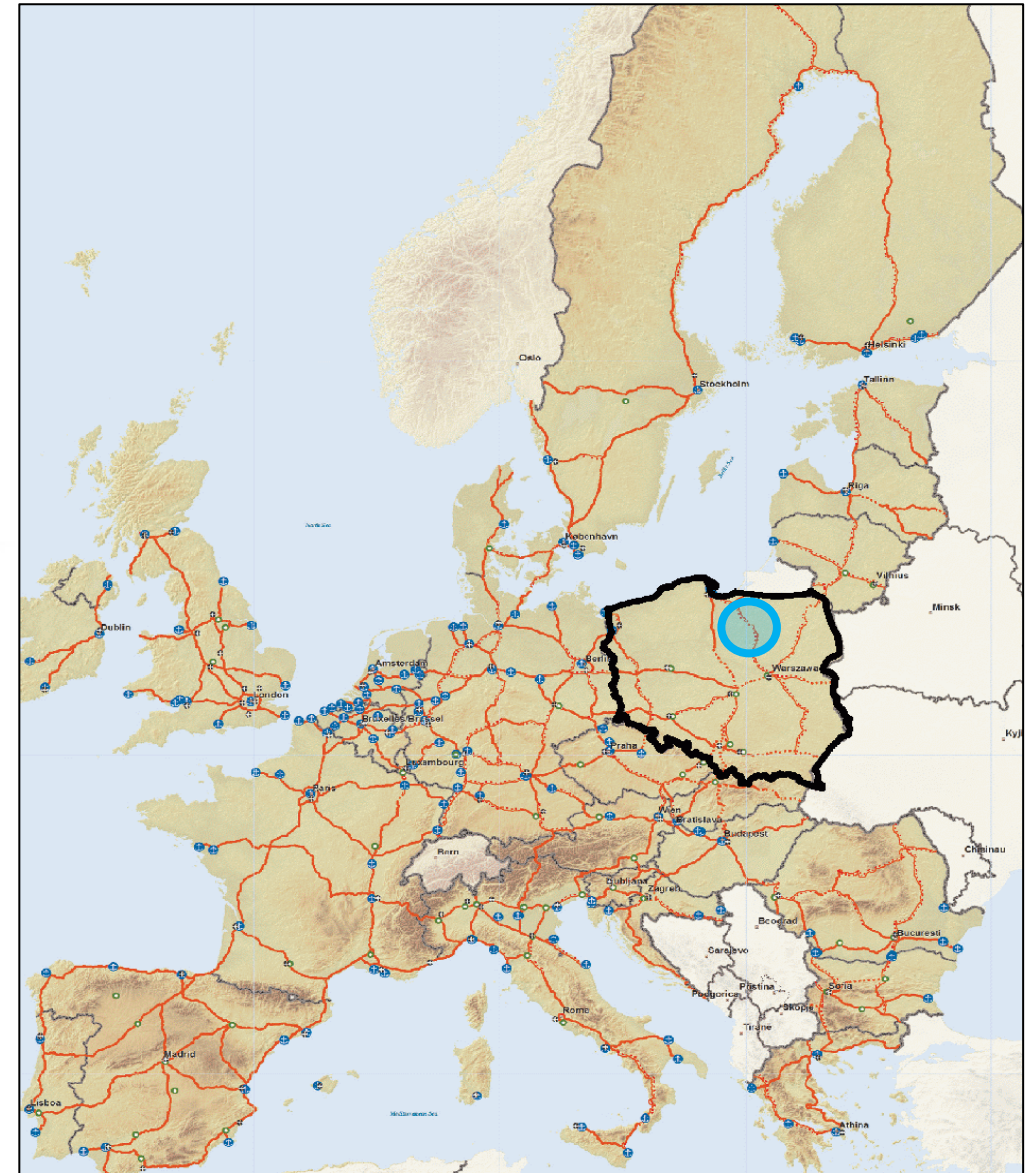
Up to 1800 km of motorways and expressways will be constructed

Total value of investments 68 billion PLN – 16,5 billion EUR



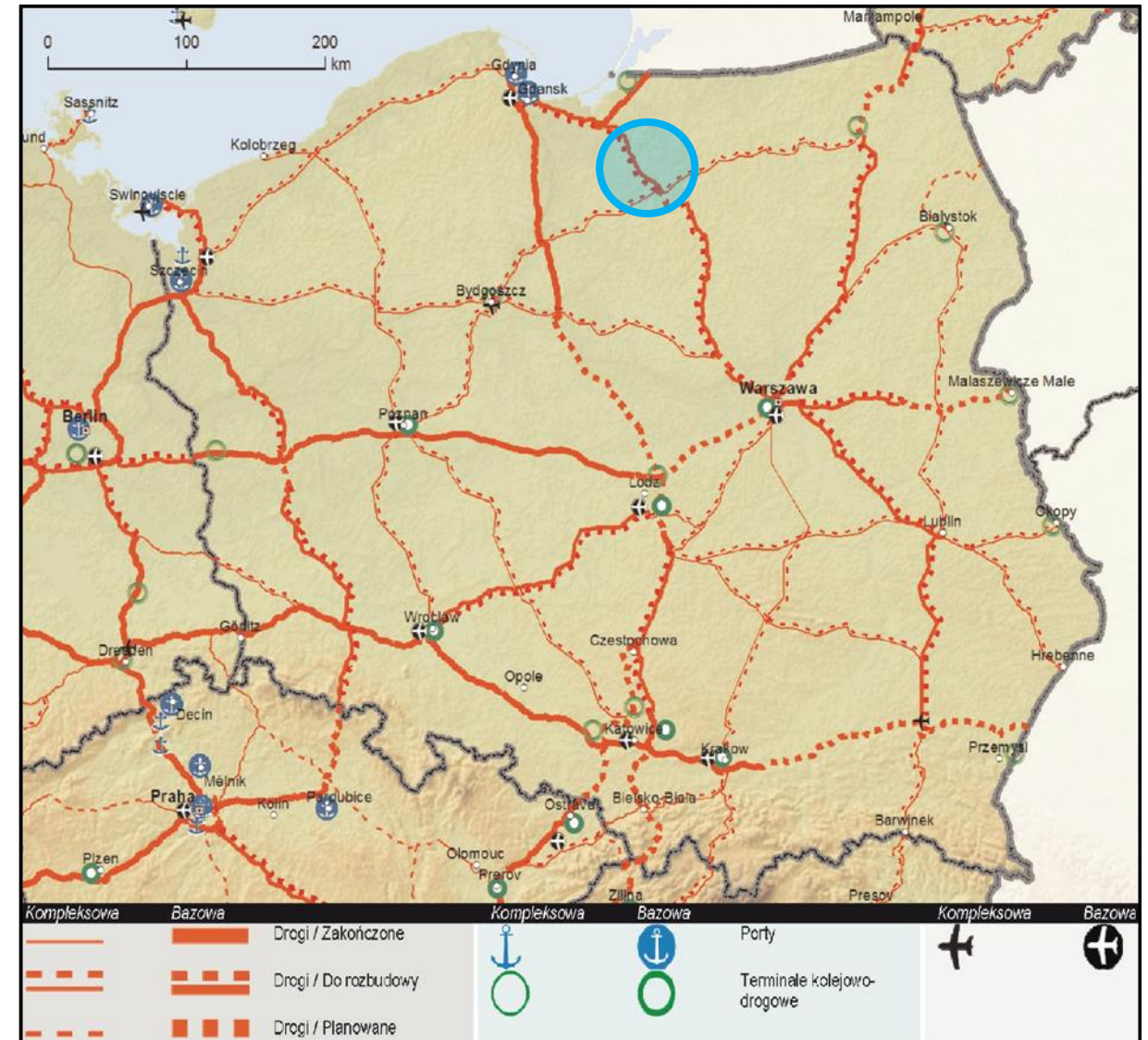
Expressway S7 section Miłomłyn – Olsztynek

- The project belongs to the first group of Polish road construction projects, which consists of 13 planned sections of expressways that are in preparation for upcoming submission (Operational Programme Infrastructure and Environment) and are first ones for Polish roads in the present financial perspective.
- Therefore, the work over this project was considered as “pilot” project in terms of new EU 2014-2020 regulations and, in particular, when considering CC aspects.
- This was the pilot under the framework for preparation of national guidance on CC aspects as well as for the preparation of project documentation required by EU.



Expressway S7 section Miłomłyn – Olsztynek

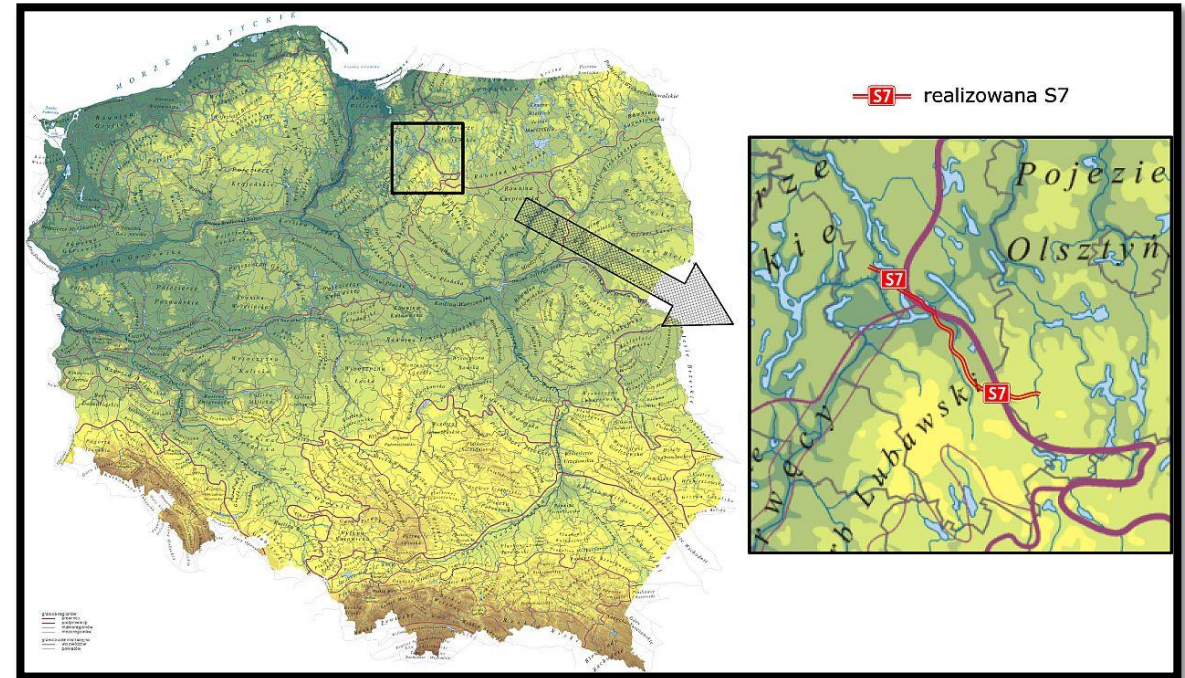
- Expressway S7 Section Miłomłyn – Olsztynek is:
 - a part of S7 corridor Gdańsk - Warsaw and TEN-T network.
 - a part of E77 European Route, running through Kaliningrad (RU) – Gdańsk (PL) – Warsaw (PL) – Cracow (PL) – Zwolen (SK) – Budapest (HU).
 - included in the National Programme of Road Investments for 2014-2023 together with other sections of S7 expressway.



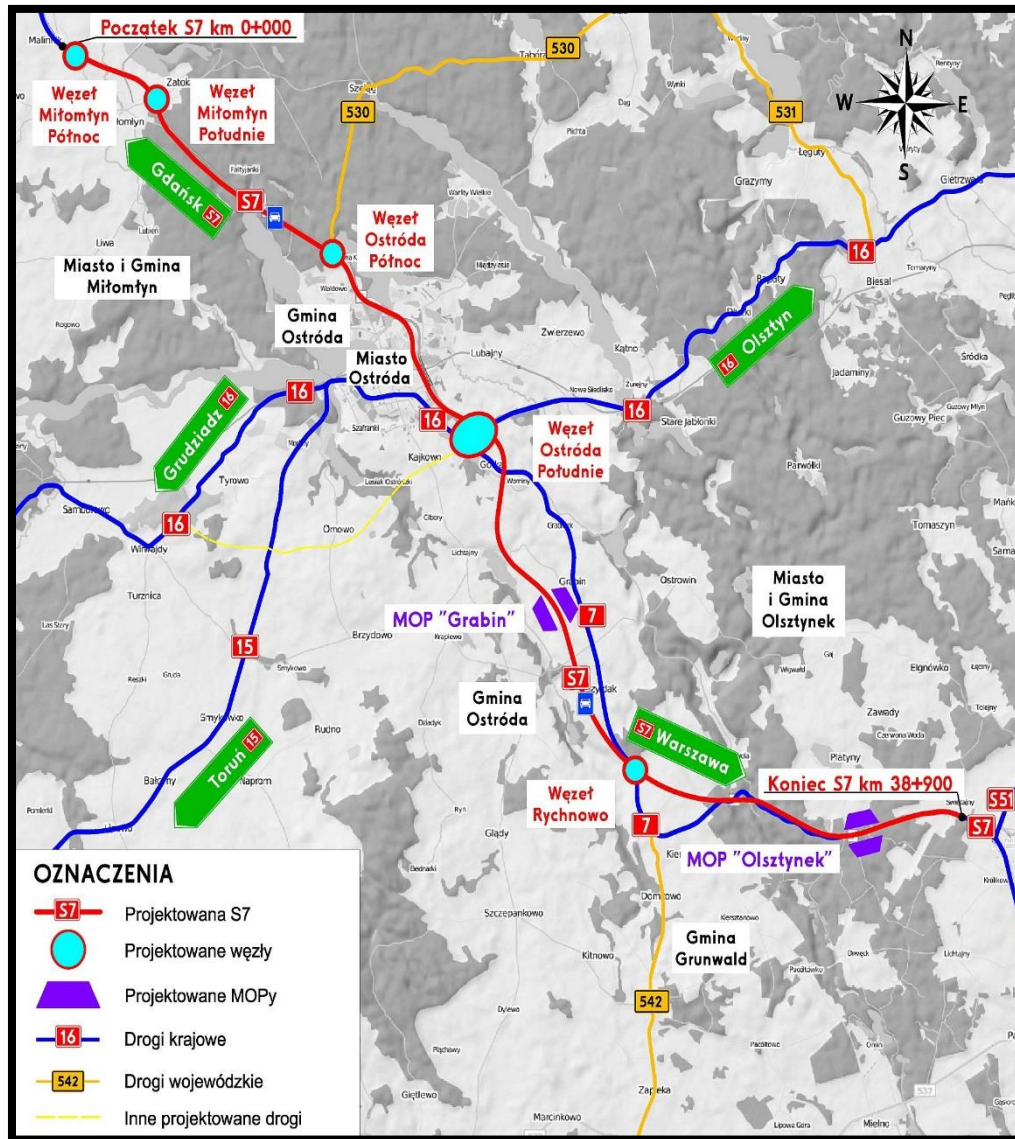
S7 expressway section Miłomłyn – Olsztynek – project description

Project technical features:

- Total length about 38,9 km
- Location – northern Poland, Warmińsko – Mazurskie Voivodeship
- Estimated traffic flow:
 - 2018 – 22727 vehicles per day
 - 2023 – 28322 vehicles per day
- Road layout: dual carriageway with 2 lanes each
- Construction of 5 interchanges
- Realisation of environmental impact mitigating measures such as:
 - Animal culverts and passages
 - Acoustic barriers
 - Sewage treatment system
 - Restoration of fauna and recultivation
- Realisation of other roads for local traffic and service roads.



S7 expressway section Miłomłyn – Olsztynek – project history



Project planning and preparatory studies concerning the project:

- the network scheme of expressways and motorways in Poland dates from 70s-80s,
- S7 corridor has been present in official documents since 1985.
- the Miłomłyn-Olsztynek section initial concept dates back to 2005
- options analysis process for the project dates from 2005 till 2009.
- environmental decisions (EIA) – 2009
- building permits (secondary EIA) – 2010 – 2012
- verification of obtained building permits and essential improvements concerning i.e. noise barriers (secondary EIA) – 2014 - 2015

KLIMADA

To fulfil the provisions of the EU's White Paper of 2009 on adaptation to climate change, the European Committee of the Council of Ministers entrusted the coordination of the Strategic Plan for Adaptation to climate change to the Minister of the Environment and with his leadership the project was delegated to the Institute of Environmental Protection-National Research Institute on 3rd of July 2009.

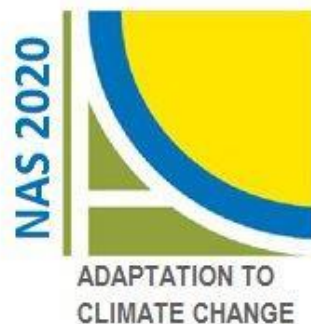
The research project "Development and implementation of a strategic adaptation plan for the sectors and areas vulnerable to climate change" KLIMADA was led in the years 2011 - 2013. The results of this project will form the basis for the preparation of a strategic plan for adapting the country to climate change and was divided into two time scales – from now on till 2030 and the period 2070-2100. The scope of work includes:

- Assessment of expected climate changes in Poland,
- The assessment of climate change impacts and vulnerability of society and the economy to these changes,
- Define the necessary of adaptation to the changes of climatic conditions of various economy and social life sectors and the estimation the necessary costs,
- Mainstreaming the adaptation to climate change into socio-economic national policy,
- Increasing the awareness of the different levels decision makers of risks related to climate impacts.

National Adaptation Strategy for Climate Change - NAS 2020

The aim of preparing National Adaptation Strategy for Climate Change (NAS2020) was to provide basic conditions for stable economic and social development, considering not only risks of climate change but also how adaptation actions can positively influence environment and economic growth.

The transport sector is particularly vulnerable to several elements of the climate, especially to strong winds, downpours, flooding and landslides, snowfall and ice phenomena, storms, low and high temperature and lack of visibility (fog, smog). The vulnerability and the impact of climate change on transport may be analyzed in relation to individual types of transport.



National Adaptation Strategy for Climate Change - NAS 2020



Flood event on a local road

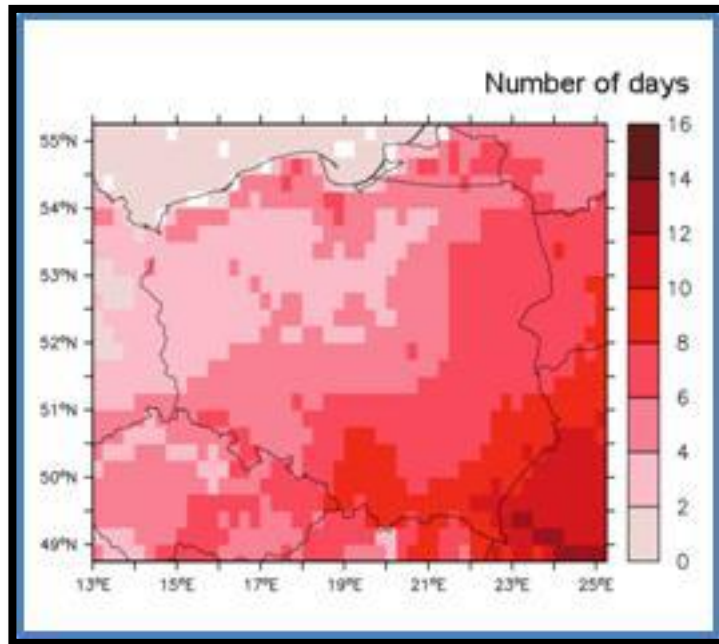


Flood affecting A1 motorway construction site

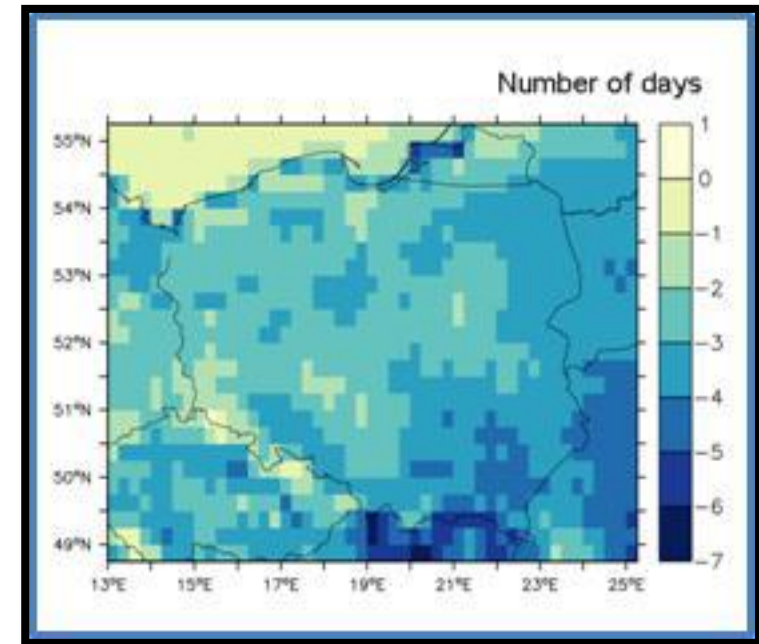
Road transport, due to its spatial nature, is particularly vulnerable to changing climatic events. Negative impact of strong winds results in situations like blocked roads and damaged road infrastructure which may grow stronger in the future. Similar changes may be observed in case of rapid rainfall and snowfall, whose occurrence disturbs the transport smoothness. Problems related to the increasing occurrence of high temperatures also affect negatively both vehicles and road infrastructure elements. Particularly troublesome for them are long-lasting heat periods. More frequent occurrence of temperatures close to zero in winter will result in an escalated occurrence of fog, which, by reducing the visibility, will have a negative impact on road transport while multiple passage through the point of 0°C in the absence of snow cover results in the rapid deterioration of the road surface.

Project climate change vulnerability and risk assessment

- Ex-post climate change vulnerability and risk assessment of the project (carried out after obtaining the development consent) was based on results of KLIMADA project climate change scenarios.
- Developed for the KLIMADA project at the Interdisciplinary Centre for Mathematical and Computational Modeling of the Warsaw University, climate change scenarios for Poland describe probable future climatic conditions. They are based on the results of simulations of the atmosphere and ocean hydrodynamic models.



Increase in the number of days with the maximum temperature exceeding 25°C when compared to the reference period.



Decrease in the number of days with the maximum temperature below -10°C when compared to the reference period.

Project climate change vulnerability and risk assessment

Process of climate change vulnerability and risk assessment analysis includes:

- identification of the different relevant weather events (hazards) for the project location and type;

Sector	agriculture, biodiversity, water resources	forestry	health, local communities	infrastructure
Phenomena resulting in damages	<ul style="list-style-type: none"> • flood • hurricane • lightning • drought • adverse effects of overwintering • spring frosts • rainstorm • hail 	<ul style="list-style-type: none"> • flood • strong winds • drought • flooding and landslides • cap of snow, intense snowfall • lightning • hail • heat waves 	<ul style="list-style-type: none"> • heat waves • cold waves • extreme events resulting in psychosocial damages, health damage and loss of life • landslides • drought 	<ul style="list-style-type: none"> • flood • flooding • hurricane • lightning • hailstorm • landslides • rime and snowfall • ice build-up

Source: Study by E. Siwiec (IOŚ- PIB)

- analysis of the probability and severity (of the hazards occurring) resulting in the level of risk for the project.
- analysis of technical details and localization of the elements of the project vulnerable to extreme weather events (i.e. sewage system, noise barriers, greenery).

Project climate change vulnerability and risk assessment – floods and heavy rains

Adaptation measures against floods (Project passes through areas with risk of flooding - the valley of Drwęca river) and heavy rains:

- In comparison with present national road no. 7 in the project S7 Miłomłyn – Olsztynek design standard of „300-years storm” for bridges was modified from the „100-years storm” after events of heavy rain in the country (i.e. being an adaptation measure at that time).
- Sewage system was designed in the efficient and effective way.
- Additionally, section S7 Miłomłyn – Olsztynek will be covered with National System of Traffic Management , which enable proper road managing during extreme weather events.

Design standards and operational measures are considered resilient enough to the aforementioned weather hazards and climate trends.



Road location against flood risk areas

Project climate change vulnerability and risk assessment – other risks

Adaptation measures regards:

- Strong winds and whirlwinds
- Thunderstorms
- Fog
- Snowfalls
- Very low and very high temperatures

For above mentioned events equivalent analysis process as the one described for floods and heavy rains was done.

As the project has already been designed, the described adaptation measures considered at design stage are already included in the design and were assessed as being resilient enough.



Location of whirlwinds in Poland

Summary

- Based on the previously described analysis, i.e. an ex-post climate change and vulnerability assessment of the project, it shows that the measures considered by the project design and the planned operational measures are considered to mitigate climate change adequately and forecasted weather events based on the available data.
- Considering the described design features and proposed operational measures, it is considered that the resilience of the project towards heavy rains is adequate as well as other identified risks.
- Proposed project was analysed and concluded to have an adequate resilience to climate change events.
- Assessment of climate change process is possible even for very advanced projects and brings them additional value.
- Experience gained from the pilot project preparation will enable further development of the CC analysis for other projects in the future.



Thank you for your attention!