## Reg. No: 2015/19/P/HS4/04067; Principal Investigator: dr Michael Niedzielski

The objective of the research project is to provide local and national policy makers as well as the general public a tool that enables them to make sound decisions when making spatial plans on land use and transportation, how to make accessibility more equitable for everyone in society and when choosing locations on where to live. Accessibility is one of the important elements of choosing home locations. People desire home locations with easy access to jobs, and many different activities that are important in their daily lives such as supermarkets, medical clinics, parks, schools, restaurants, childcare, and many others. Typically, places with better access to these opportunities are more valued by people than locations with poor access. The tools developed in this research will allow people to identify places with good and poor access and make informed decisions where to buy or rent a home. The same tools can be used by local and national governments to develop policies to improve the accessibility of poor access areas. This is because accessibility is influenced by where homes and jobs are located and the transport network between. Home and network locations can be influenced by government policies through zoning regulation or tax policies that can influence where new homes and businesses are built and road or public transport network are improved. Accessibility can be improved by making travel through the transport network easier such as reducing congestion through road network or public transport enhancements or by providing incentives to build homes and businesses closer to each other.

The main reason for choosing this research topic is to provide a useful and practical tool for the general public and policy makers. This research has a theoretical and modeling component, but this is not the goal of this research itself. Rather, this research is a means to apply academic research to provide practical tools for knowledge decisions. This leads to another reason, which is to improve people's quality-of-life. If people can access things that are important to their lives, they will lead better and more productive lives.

This research uses Geographic Information Systems to calculate accessibility to jobs and non-work opportunities at the municipality level for all of Poland and for selected cities. It will calculate accessibility to different types of jobs and non-work activities for a range of different travel time thresholds such as 2km-100km and 10-90 minutes. The number of jobs and non-work activities accessibility within each travel time threshold will be calculated. These results will be mapped and the maps will be available for the general public and policymakers to view and interpret themselves. It will be easy to see which locations in Poland have more hospitals, childcare, supermarkets, parks, or restaurants close by than other locations. Statistical analysis will evaluate the relationship between commute lengths and accessibility allowing policy makers to understand the influence on commutes and how they can be reduced to reduce the negative impact of commuting on the environment such as pollution.