# Proposal LA-558 3/30/2023 Farzaneh Faramarzi Professor Seeger

# Project title: Wind Turbines Effect on Road Safety in Iowa

**Abstract**

Distraction accounts for 25% of the crashes in united states approximately. Influence of the wind turbine installations as a driver distraction on the number of crashes has been studied in this investigation. This issue is of prime importance for the state of Iowa as it has more than eight per cent of the total wind turbines install in USA. The crash database of the state of Iowa which correlates the crash number and severity to various contributing factors, in conjunction with the spatial data analysis have been used to better comprehend the location, time, quantity and severity of the occurring accidents and correlate it to the installed wind turbines for a particular region during a specific time frame. Analyzing this database for the years 2016 and 2018, has enabled us to better understand the influence of wind turbines installed during 2017 on the crash number. Various buffer values based on the drivers’ sight distance have been selected to better examine this influence. Interestingly, it was found that at the year 2018 (one year after installation of the wind turbines) the number of the crash cases were less than the year 2016 (the year before installation) at the same regions.

**Overview:**

Driver distraction has shown to be one of the major influencers leading to vehicle crashes as 9%

of the fatal crashes are reported to have been caused by a sort of driver distraction (according to a

report published by National center of statistics &amp; analysis at 2019). Anything that averts a

driver’s attention is considered a type of distraction regardless of the fact that it is caused by an

issue inside the vehicle or outside it. While the inside distractions can be generated by talking,

smoking, cell phone use, reaching for objects or even inattention, the Outside the Vehicle

Distractions (OVD) have their origins out of the vehicle such as inappropriate signs, pavement

quality and sceneries. While a considerable proportion of the studies have been allocated to the

inside the vehicle distractions, OVDs have also shown to be a significant player. For instance, in

one of the studies conducted by NHTSA, it was claimed that 30% of the crashes had their origins

outside the vehicle. There were other studies underscoring the significance of the OVDs (Glaze

and Ellis (2003), Klauer (2006), Olson (2009), Victor (2015)). In this respect, one of the nascent

fields of OVDs is related to the impact of windmills on the distraction of drivers. This study aims

to study and better understand the influence of windmills on the distraction of drivers leading to

crashes.

**Technology:**

I will use R and Q-GIS as well as Tableau to tell the data analysis in a fluent story.

**Data:**

* Crash Data
* Vehicle Level Crash Data
* Wind turbines Shapefile Data
* City Area Shapefile Data

**Inspiration:**

* **Iowa DOT Open Data:** <https://public-iowadot.opendata.arcgis.com/>
* **The U.S. Wind Turbine Database:** <https://eerscmap.usgs.gov/uswtdb/>

**Potential Challenges:**

* **Cleaning Data**
* **Merging Data** that crash data has since 2012 but vehicle level has since 2013.

**Timeline:**

I am planning to finish up this project by the end of April 2023.

I will start with cleaning, merging, mapping in GIS, analyzing, plotting in R or Tableau, building the webpage, and finally writing my story.