# Societal Context Assignment

CE 599-002: Data Science in Transportation

Spring 2019

Papers Due: April 23, 2020, 5 pm in OHR 261

Facilitated In-Class Discussions: April 28

\*\*Connection to Student Outcomes\*\*

ABET has identified the following student outcomes for engineering programs. This assignment relates to outcomes g through j, shown below in \*italics\*.

(a) an ability to apply knowledge of mathematics, science, and engineering

(b) an ability to design and conduct experiments, as well as to analyze and interpret data

(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(d) an ability to function on multidisciplinary teams

(e) an ability to identify, formulate, and solve engineering problems

(f) an understanding of professional and ethical responsibility

\*(g) an ability to communicate effectively\*\*

\*(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context\*\*

\*(i) a recognition of the need for, and an ability to engage in life-long learning\*\*

\*(j) a knowledge of contemporary issues\*\*

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Broadly, it asks the students to consider our work as engineers and data scientists in relation to a broader societal context. The assignment is to consider one of three books or reports, and communicate, both in class and in writing how the literature relates to contemporary issues in transportation and data science.

The task is assigned in the hope that it provides a model by which students can continue to engage with the larger implications of their work, in their role as engineers and as citizens.

\*\*Assignment\*\*

You should prepare a policy brief on one of the following topics. Your brief should be no more than a few pages and easy to read. The intended audience is city council persons or high level university administrators. Your brief should draw from appropriate sources and make recommendations for best practices as warranted.

\*\*Topic 1: Smart Cities\*\*

The Mayor of Lexington is interested in making Lexington a Smart City and has directed her Chief Technology Officer (CTO) to identify what that would look like and how Lexington may be able to benefit. The CTO in turn has reached out to you to provide a summary of what other cities are doing, what types of projects may benefit Lexington, and what issues should be considered in selecting among those projects.

\*\*Topic 2: Mobility Data Specification\*\*

As part of the permitting process for allowing e-scooters to operate in the city, Louisville requires operators to provide real-time data on the location and operation of scooters to the city in accordance with the Mobility Data Specification (MDS). Along with other cities, Louisville also sits on the board of the Open Mobility Foundation (OMF), which is responsible for housing and maintaining MDS.

The City of Los Angeles also requires operators to provide MDS data. Uber, which operates the Jump bikes and scooters, refuses to comply and is instead argues that providing those data would violate user privacy. They are suing Los Angeles and are joined by the American Civil Liberties Union (ACLU). In parallel, the California Legislature is this week considering whether MDS data violates California privacy laws.

Louisville has reached out to you as an outside expert. They wish to get your guidance on how to effectively balance privacy and transparency, and how/if they should proceed with respect to MDS.

\*\*Topic 3: Institutional Review Board Big Data Guidance\*\*

The Institutional Review Board (IRB) at the University of Kentucky exists to provide ethical review of proposed research projects conducted at the university. Their focus has historically been on human and animal subjects. IRB recognizes that research in many university programs is now using "big data", often collected about people without their awareness. They are considering whether such research should be considered to involve human subjects. Further, they are looking to provide guidance to reviewers and to researchers on how to effectively evaluate the ethical considerations of their research. IRB has asked you to provide a brief on the topic.

Parking Management - <http://sfpark.org/>

Smart City Columbus - <https://smart.columbus.gov/about>

Smart Cities USA - <https://www.routematch.com/top-10-smart-cities-us/>

Internet of Things (IoT)

Integration

Digital Incubator