

Connected Intersections

[YouTube Presentation](#)

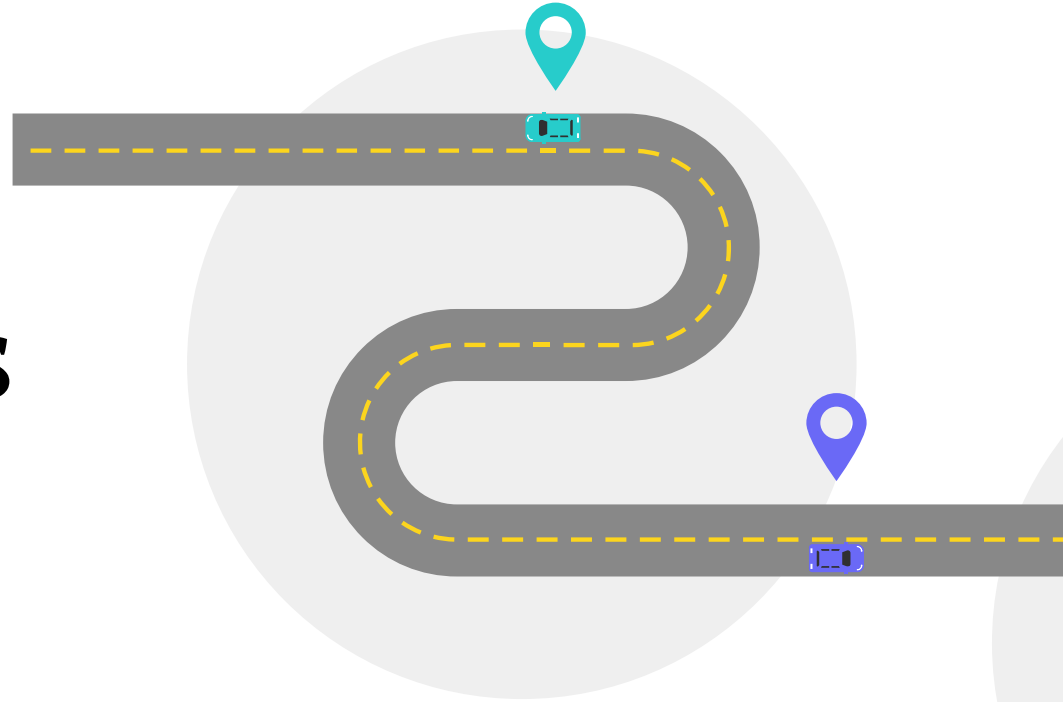
Ken Dizon

MSDS 696 - Practicum II

Prof. John Koenig

Initial Version: 10/24/2022

Version 1.2: 11/10/2022



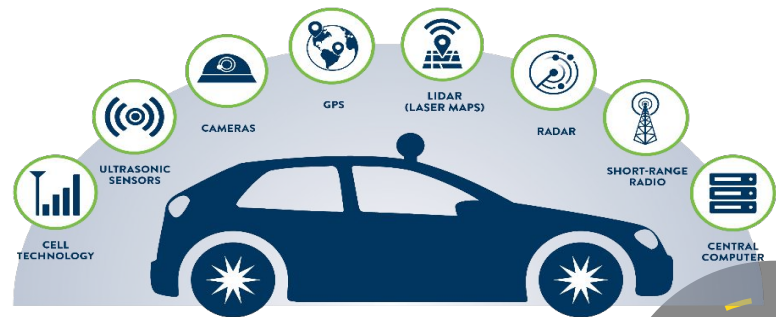
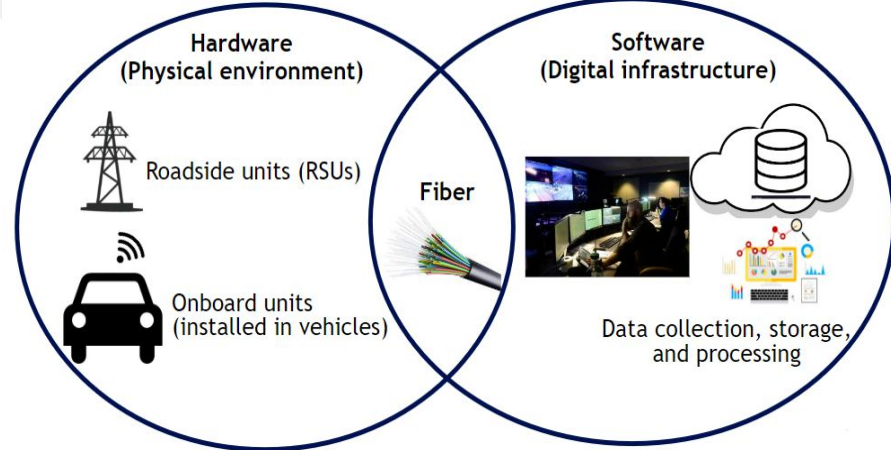
Challenge & Opportunity

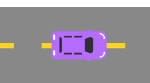
The future of vehicles is shifting towards a cloud based approach to manage vehicle big data used for insights.

Connected Vehicles (CVs): A vehicle that can communicate with other systems. Equipped with technology, that allows the vehicle to send information to roadway operators (and other users) for decision-making.

Cloud computing: remote extraction, loading, and storage process of data over the internet.

Connected Intersections (CI): an infrastructure system that broadcasts signal, phase and timing (SPaT), mapping information and position correction data to vehicles.





Research Question

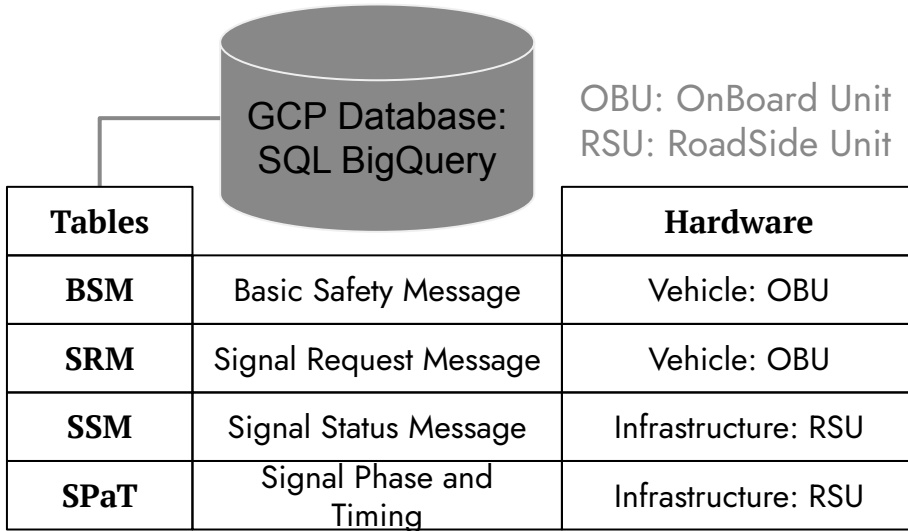
Type: Exploratory Research

Determine how different connected vehicle messages interact with a connected intersection to produce an assignment based intersection management system?

Ideally produce data visualizations that see a vehicle coming into an intersection, request signal priority, and the corresponding response resulting in a vehicle leaving the intersection.



Data



Data Tables

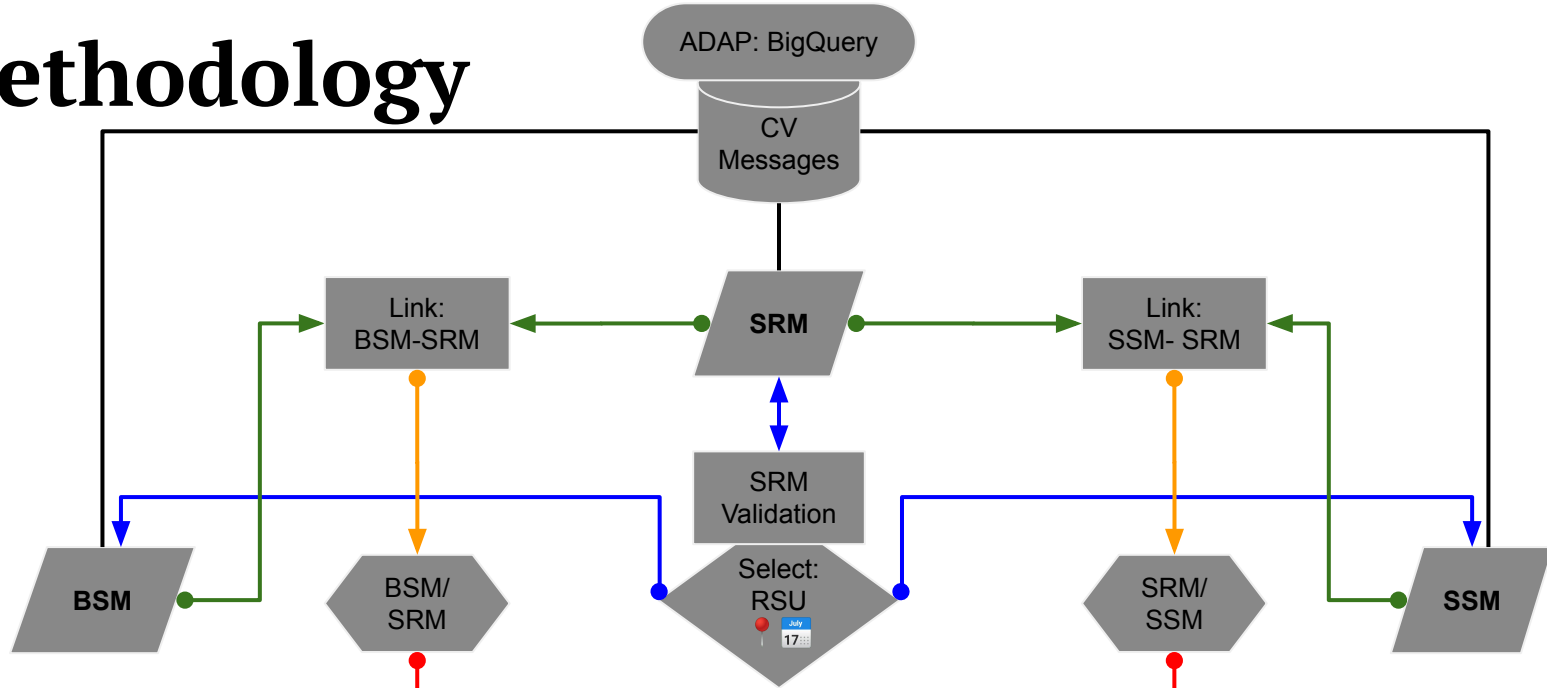
BSM: is used in a variety of applications to exchange safety data regarding vehicle state. This message is broadcast frequently to surrounding vehicles with data content as required by safety and other applications.

SRM: sent by a V2X-equipped entity (vehicle) to the RSU in a signalized intersection. It is used for either a priority signal request or a preemption signal request depending on the way each request is set.

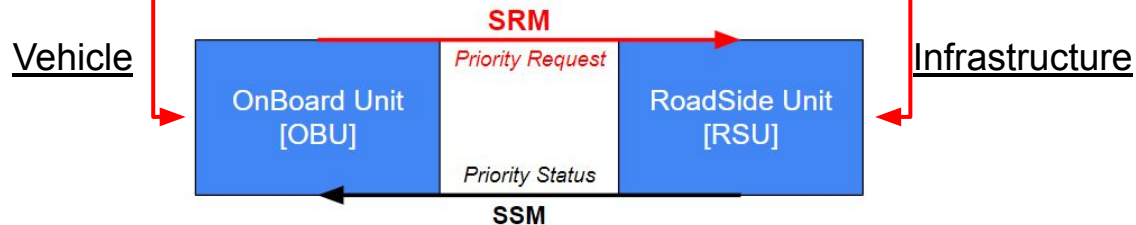
SSM: sent by an RSU in a signalized intersection. It is used to relate the current status of the signal and the collection of pending or active preemption or priority requests acknowledged by the controller.

SPaT: describes the current state of a signal system and its phases and relates this to the specific lanes (and therefore to movements and approaches) in the intersection.

Methodology



TSP: Traffic Signal Priority Framework



Line Color Legend:

Data Source

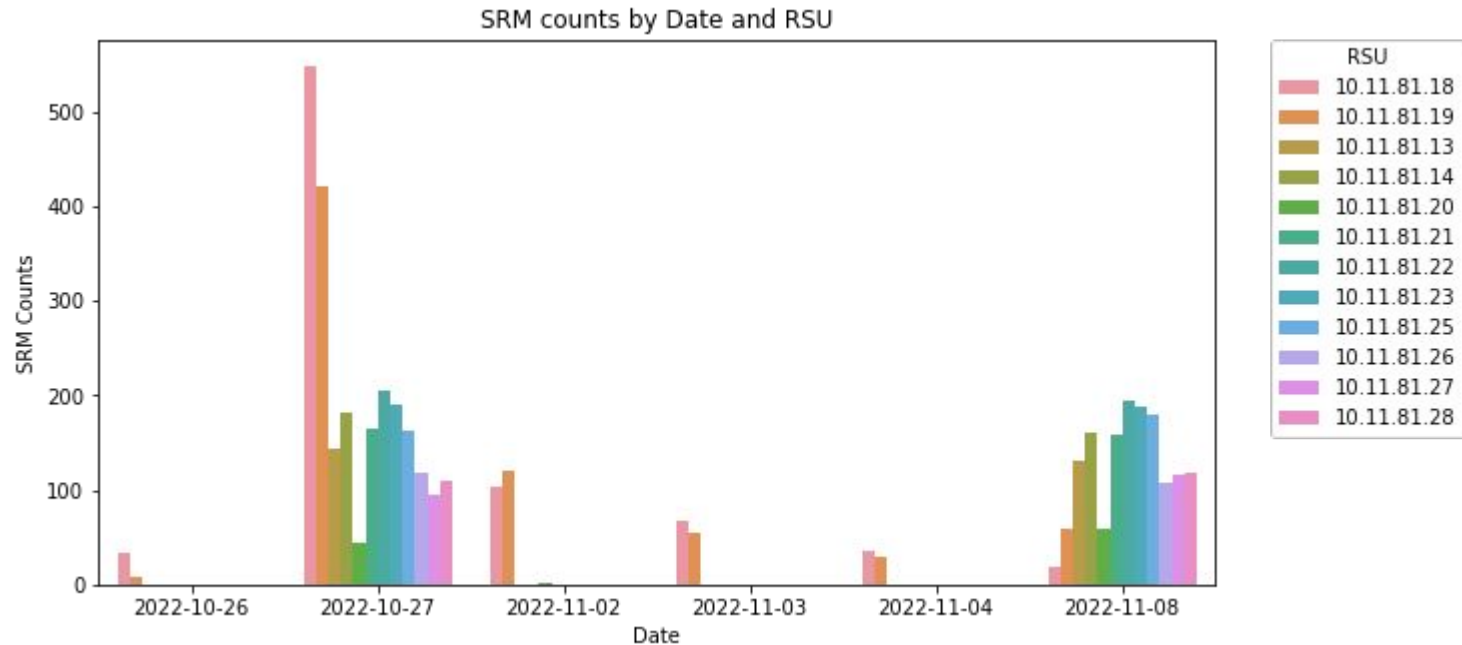
Query

DataFrame Join/Merge

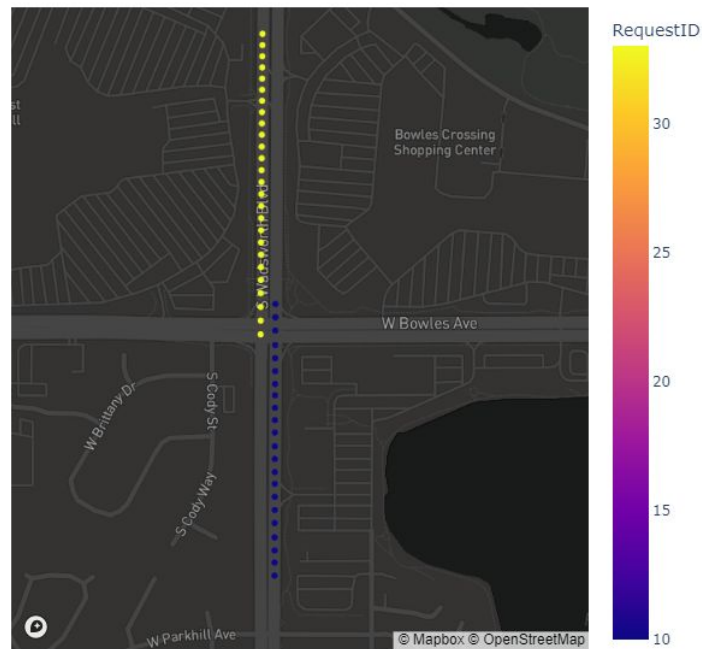
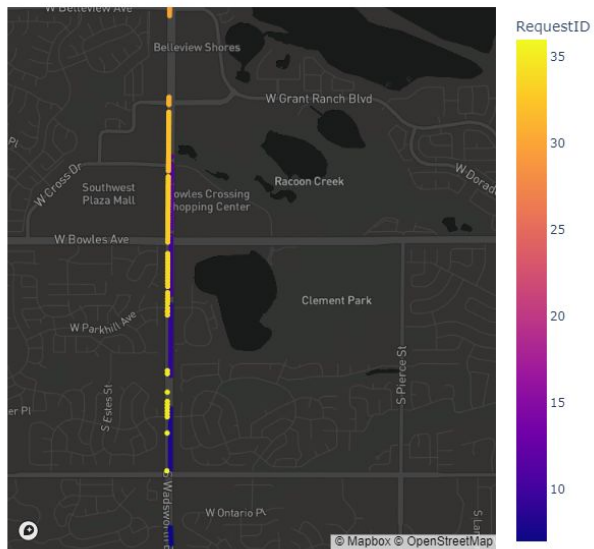
Data Prep

Connected Intersection

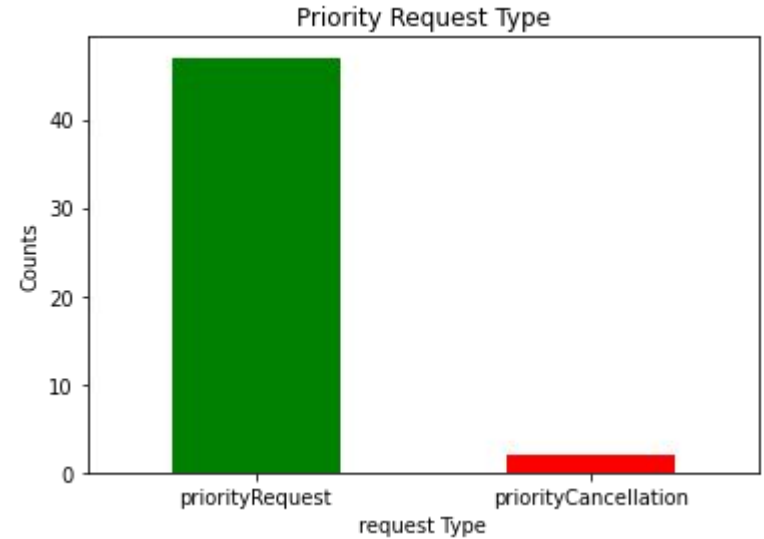
Results



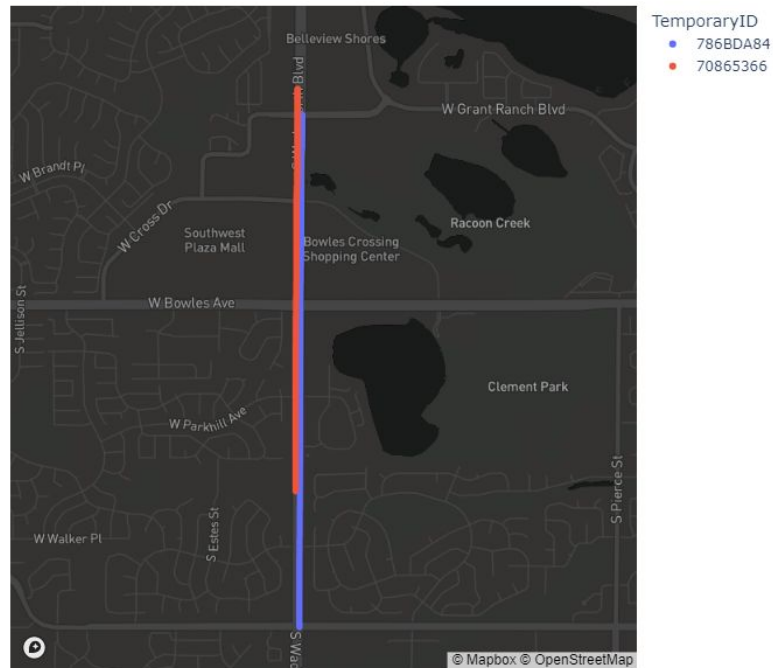
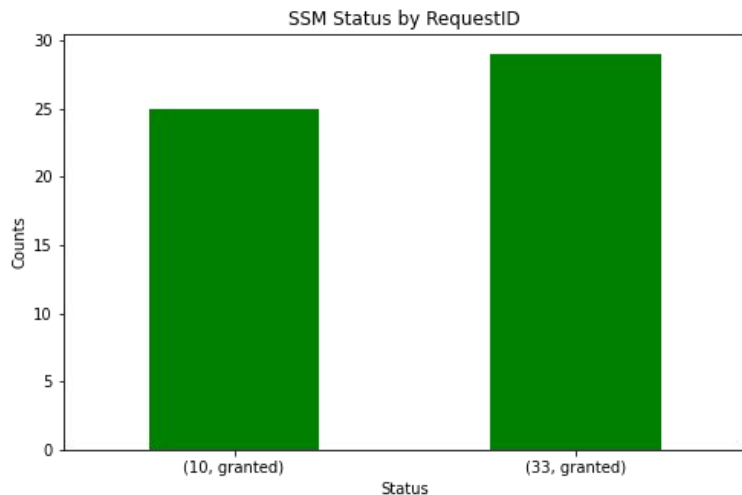
Intersection SRM



SSM Status



Intersection Trail



Contact



Data Science Student, Regis University
Anderson College of Business & Computing

✉ kdizon@regis.edu

[LinkedIn](#) [Youtube](#) [Presentation](#)