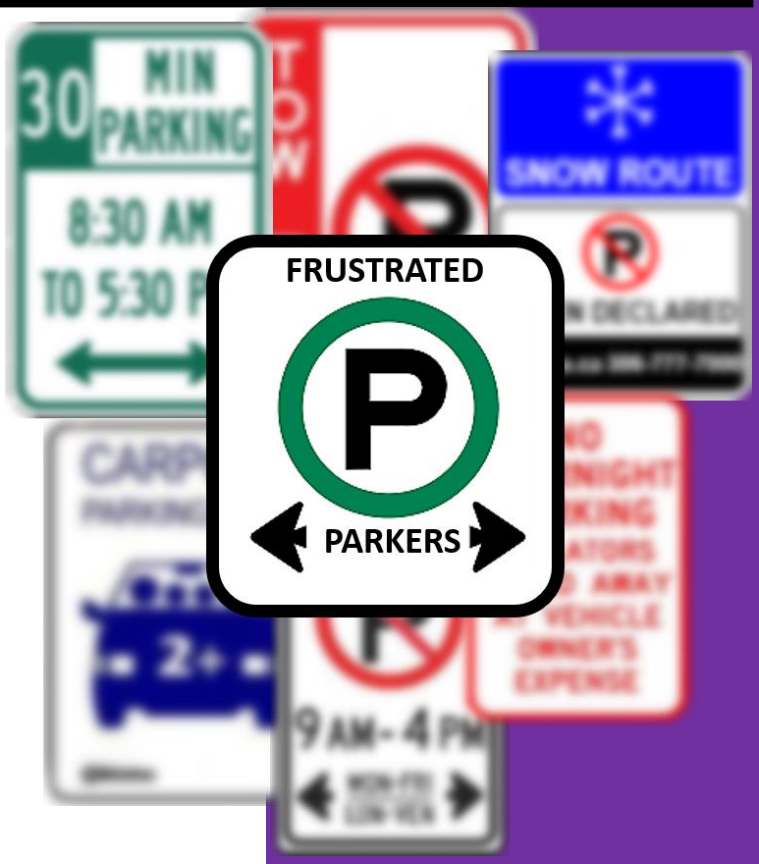
Esri App Challenge 2018



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Mission Statement

Have you ever been frustrated finding a parking spot when you are in a rush, or new to a city? We aimed to create a mobile application to tackle the issues of finding parking spots and some of the other issues that comes along with it.

Frustrated Parkers seeks to help users to find parking spots for their vehicles, be that a car, a bike, or even an electric car. Knowing if a street has a restriction or if it will be a no parking zone is helpful in planning where to park. More people are taking the environment into consideration by choosing to carpool, own electric cars, or bike to work. There are designated spaces for these kind of vehicles, and knowing where to park in these situations can help people to get a better parking spot. The app functionality aims to ease the access to parking spots for visitors and residents in Toronto, and to provide seamless and enjoyable experiences for parkers.

Project questions

The Frustrated Parkers application idea was raised after looking at parking regulations in Toronto, and wondering about the following issues:

- How could it be determined if a street is a no parking zone or has a parking time restriction? Could that be represented on a map to help the users to park at the right spot?
- Parking restrictions change during a snow emergency, but if you are not from the area, how do you know in which street can you park or not? Users should be aware of when they need to move their cars from the street due to snow routes.
- Carpooling and electric cars have special designated parking which could give people a better parking spot. Are the citizens aware of this?
- Could the distribution of parking tickets help people to be more aware of where they park and pay more attention to street signs?
- Have you ever forgotten where did you park your car or got a parking ticket because you forgot to renew the park meter? Could and app help to track where you parked your vehicle and for how long has it been parked there?

Data Sources

Open data retrieved from the City of Toronto's Open data portal was used for the development of this application. Data for parking regulations, streets, and bicycle parking was downloaded and processed.

Data Processing

Most of the data downloaded from the open data portal was in an XML format containing addresses and intersections. There was a need to convert all the XML files to CSV to be able to load them into the ArcGIS platform and geocode all the data to get the specific coordinates. A lot of time was spent on cleaning the geocoded data so that it would be mapped in a way that would be understandable and concise. The following steps were taken:

- The intersections needed to be altered in a way that the geocoding locator could read and understand them.
- We needed to assure the produced points matched with the data, involving major data cleaning.
- Lines were produced from the matching of these points (Using points to line tool). Some of these lines had to be processed manually to follow along the streets.

After processing and cleaning the data, each layer was uploaded to ArcGIS Online as Feature layers, to be able to store it in the cloud and have access to it. Several web maps and symbolized feature layers were generated from this data, to be able to access it from the Application and visualize it.

Challenges

With a project of these characteristics, time is the main conditioning factor. The words that always came to us were "if only we had more time…". We tried to overcome this challenge having a good organization and structuring the work in different tasks and steps. Each of the group members had a defined role, but we always worked together to help each other and overcome any problems that would come up during the development. Another challenge was the big amount of data we had to work with and how we could represent this data in a meaningful way. A lot of time was spent on cleaning the geocoded data so it would be understandable and could be used to create Web Maps in ArcGIS Online. The use of the AppStudio was also a big challenge for the developers, as none of the group members knew the platform in advance, neither the QT or QML programming language. However, previous programming experience in other languages, determination, and few hours of sleep, helped us to produce the Frustrated Parkers Application.

App Characteristics

The app includes a Welcome Page (Swiping view) which allows to get to know more about the app, swiping across all the main functionalities. The app is structured in a Menu drawer Interface, which once the application has started, it allows the user to navigate and switch between all the options. The app comprises the following functionality, each of them associated to a menu option:

- Explore Car Parking:
  - A web map which displays all parking facilities for cars differentiated by accessibility (public/private/staff/members).
  - Contains a locator bar on top for searching locations.
  - Displays all No Parking and Restricted Parking streets with clickable info pop-up.
  - Finds the route to a specific parking facility once clicked on the feature.
- Find Closest Parking Lots: an interface that allows to find the closest parking facility, either tapping on a point on the map or from the user's current location.
- Snow Restricted Parking: an interface that displays restricted parking streets under snow alerts.
- Car Pooling and Electric Car Parking: a web map that displays designated carpool and electric cars parking locations.
- Explore Bicycle Parking: a web map that displays parking facilities for bicycles including racks, indoor and outdoor parking.

- Explore Parking Tickets: a web map which displays a heat map of the distribution of parking tickets for the city of Toronto.
- Park My Vehicle:
  - It allows the user to pin the parking location of their vehicle (car or bicycle) as a reminder of its location.
  - It allows the user to track how long the car has being parked using a timer.
- About page: additional information about the creators of the app and a link to the story map.

Story Map

http://bit.ly/2FZ4MZ3