# Objectives

The overall goal of this project is to use the Internet of Things (IoT) to tangibly assist the citizens of the city of Calgary in a practical and user-friendly way. In order to accomplish this goal, several smaller objectives and sub-objectives have been set out. The intention of these objectives is to set out clear, achievable tasks which will lead to a useful application and also fulfill the requirements of this course. However, because these are being outlined at a very early stage in the project, it is anticipated that some adjustments will occur as the project progresses. An outline of the main objectives is provided below. In the following description, each of the main objectives will be explained, followed by relevant sub-objectives.

**Objective 1**: Determine a location-based application of the IoT which is relevant to the city of Calgary. This requires defining a problem relevant to Calgarians (or a particular sub-group of citizens, such as civil servants, university students, environmentalists, etc.), specifically identifying a component which can be measured and the importance of its spatial properties. The scope of the application should be outlined, including what area it will cover and what value it will bring. In order to continue with the project, the application should be selected by DATEHERE.

**Objective 2:** Design a sensor setup which can measure data suitable for the application determined in objective 1.

***Sub-objective 2a:*** Determine the technical requirements necessary for data measurement, such as the sensor(s) required, and other periphery elements needed. These requirements should be written into a technical specification report with an accompanying sketch of the sensor setup.

***Sub-objective 2b:*** Create a working prototype of a sensor which could be deployed in the city. The prototype’s technical specifications should follow the technical requirements detailed in sub-objective 2a.

***Sub-objective 2c***: Test the prototype in a lab setting, in order to understand functionality and limitations. Simulated environments should be used so that adjustments can be made before testing in a field setting. All test data should be saved and stored in a secure format, and should be accompanied with detailed experimental notes (such as dates of testing, differences in conditions, etc.)

**Objective 3**: Develop a library which links the sensor setup and the OGC RESTful API.

***Sub-objective 3a***: Learn necessary language(s) required for writing a library which will work with the chosen sensor setup. Proficiency is needed to a point where it will be possible to write a working library; as such, learning should have a concentrated focus.

***Sub-objective 3b***: Collect test set of data with multiple sensors in a working/usable configuration in the city. The configuration may be sparser than actual deployment, but should be a reasonable (e.g. at least 5 sensors) network. All test data should be recorded and stored in a secure format. Experimental notes should be kept, including details such as date(s) of experimentation and times, pictures of location, weather conditions, etc.

**Objective 4:** Create a user interface (UI) such as a webpage or mobile application which makes use of the OGC RESTful API to display the sensor data.

***Sub-objective 4a***: Design a user-friendly graphical interface which is tested and found intuitive by at least 80% of test subjects. Testing will be based on hands-on experience and will be evaluated by means of a standardized survey. Feedback collected will be used to improve the final version of the user interface.

***Sub-objective 4b***: Represent collected data (in real time) using the created user interface and create a video of its usage. The video should show both how to use the developed UI, as well as prove its functionality.

**Objective 5:** Fulfill all deliverable obligations as explained in the ENGO 500 course outline punctually and professionally. These deliverables will also serve as one means for tangible documentation and measure of progress.

***Sub-objective 5a***: Write a project proposal which outlines background information, project objectives, methods and expected outcomes by September 27, 2013. This proposal should include some initial research into the topic, as well as planned objectives and methods for meeting those objectives. A Gantt chart showing the planned breakdown of tasks should also be included.

***Sub-objective 5b:*** Complete a literature review which thoroughly explores the history of the topic, current state-of-the-art and applications. This should be completed by November 18, 2013.

***Sub-objective 5c***: Present a report of technical deliverables in two forms: written and oral. The written report component should be accomplished by December 6, 2013 and the oral component should be presented at an appointed time between November 22 and December 6, 2013. This report should cover the technical deliverables which are to be accomplished in the previous four objectives.

***Sub-objective 5d***: Give a progress report in two formats: written and oral. The written report should be completed by February 14, 2014 and the oral report should be given at an assigned time between January 31 and February 14, 2014. The progress report will communicate work done towards the final goal.

***Sub-objective 5e***: Create a final project report in two formats: written and oral. The first draft of the written final report will be completed by April 5, 2014. An oral report, given as a defence, will take place at an appointed time between April 7-11, 2014. Based on feedback from the oral defence, a revised copy of the final report will be finished by April 28, 2014. The final report represents the culmination of all the project work throughout the school year.