# **Methodology**

* Project Description and Scope
  + Need to iron down exactly what we are planning on achieving, consult Tahar
  + Refined Project Description found here:
    - [Refined Project Description](https://www.notion.so/Refined-Project-Description-1c36bc6d959a49868314193bc8adfd40?pvs=21)
* Literature Review:
  + Research existing AI-based solutions for traffic congestion worldwide and then focus on Dublin
    - [Literature Reviews](https://www.notion.so/Literature-Reviews-3e0eb99d5fc24c0f9e1eb5e4e628152d?pvs=21)
  + Study relevant AI techniques, algorithms and technologies in traffic management
    - [Machine Learning](https://www.notion.so/Machine-Learning-251bf0751e9f4d9db2d8335981554abd?pvs=21)
  + Investigate any previous projects or research related to traffic in Dublin
    - [Literature Reviews](https://www.notion.so/Literature-Reviews-3e0eb99d5fc24c0f9e1eb5e4e628152d?pvs=21)
* Data Collection:
  + Identify and collect relevant data sources for Dublins traffic, such as traffic flow data, weather date, historical traffic patterns and road infrastructure information
    - [Data Collection](https://www.notion.so/Data-Collection-aeefb2559a1641068092a00f42f4f4e5?pvs=21)
* Data processing:
  + Clean and preprocess the data
    - Missing or null values
      * Dropping rows
      * Replacing null values with approximates (Median, Average, etc)
    - Detecting duplicate data
      * Potential dropping of rows to prevent noise
    - Detecting outliers
    - Replacing datatypes for efficiency
  + Prediction model development:
    - Developing the right classifiers and models
* AI model Selection:
  + Choose AI techniques that are appropriate for my project, such as Machine learning, deep learning or reinforcement learning
* Split Training and Testing:
  + Split data into training, validation and testing sets
  + Train and fine-tune AI models with appropriate algorithms and classifiers
  + Evaluate the performance of your models using relevant metrics like accuracy, prevision, recall and F-1 Score
* User Interface / Simulation:
  + Use a simulation software to test and interact with my AI-based traffic management system
* Performance Optimisation:
  + Fine-tune models and algorithms to optimise their performance in the contact of Dublins traffic conditions
* Ethical and Legal Considerations?
* Documentation
  + Keep thorough documentation of project, including code, data sources, methodologies and results etc.
* Feedback and Iteration
* Conclusions