Requirements:

Continuing from the conclusion of the background research. According to all the past studies and research discussed, their methods included creating base maps to create thematic layers which offer valuable information enabling for effective analysis.

This includes creating a topography and land coverage layer. Topography layer will consist of map features regarding roads, structures, motorways etc. As well as the land coverage map providing data including water bodies, forests, arable land, agriculture and such.

These map layers will form the foundation of this study as the base maps. By creating a composite map from these two layers, it allows for easier analysis to filter down possible landfill sites by looking at where the landfill is located. i.e. If a landfill is located next to a road, or water body it should be ruled out based on the constraint set keeping in mind it should be environmentally sound and avoid disruption to the scenery etc.

However, there are more maps to consider from the base maps generated as well as the data sets provided.

Firstly, extending from the topography and land coverage maps, it may be beneficial to create certain buffer layers from features within those maps using the default GIS raster maps. For example, buffer layers for water bodies or roads etc. By creating appropriate buffer maps, it allows for easier analysis and understanding of generally what landfill sites are most appropriate based on the constraint of being environmentally sound to ensure that landfill site is built beyond these specified buffer zones.

Additionally, there are various data sets that have been given to consider when choosing the landfill site. Many layers should be created from these and combined with others to derive very important data that will be crucial. One example is to re-class the land coverage layer and create a land-cost layer by replacing the values with arbitrary ones by way of justification i.e. pastures and scrubs set to 1, whereas residential areas or water set to 10. As building the landfill in these different areas bring about different levels of complications with an associative cost.

After this, combining the land-cost layer with the soil-type layer will produce a cost surface map which highlights areas that will be low-high cost to build landfills based on information from both maps. Due to the fact that various different soil types will also affect the level of cost of building a landfill, in this case sand will cost less than a built-up area for example.

It will also be useful to create negative-buffer layers around specific areas consisting of rare wild-life to ensure that the landfill chosen is not located within these exclusion zones, to preserve the scenery and minimise negative impact to the environment.

As well as this, there are various different layers that will be important to the analysis of this study including : [Net Income Survey](https://vle.aston.ac.uk/bbcswebdav/pid-1502895-dt-content-rid-9807471_1/xid-9807471_1), [Wind Speed](https://vle.aston.ac.uk/bbcswebdav/pid-1502895-dt-content-rid-9807470_1/xid-9807470_1), [Days with Fog](https://vle.aston.ac.uk/bbcswebdav/pid-1502895-dt-content-rid-9807464_1/xid-9807464_1), [Mean Sunshine Hours](https://vle.aston.ac.uk/bbcswebdav/pid-1502895-dt-content-rid-9807466_1/xid-9807466_1).

By using the Net Income survey map, it allows us to see the locations of the population throughout Leicester. Indicating general locations which should be avoided when choosing the landfill, attempting to disrupt the population as least as possible.

With the wind-speed layer, this information highlights the average annual wind speed within different locations. Using this map to reduce air pollution is possible if selection of landfill is not placed in areas with high annual wind speeds.

Including this, it is possible to preserve the beauty and nature of the environment further when choosing the landfill in regards to Days with fog map which indicates the average number of days that are foggy in different locations. By analysing this map data, choosing the landfill to be in areas where it is most foggy will not dramatically affect the environment as well as it not disrupting the scenery very much.

Moreover, Mean Sunshine Hours map shows the average hours of sunshine of each location in the study area. Analysing this map, can enable choice of landfill to be placed in locations where the mean value is low therefore affecting the scenery as little as possible.

Using all these layers, it is possible to derive more data from combining certain layers together. For example, combining all the buffer layers into one single layer allows easier analysis and comparison to other maps?

**Buffer layers:**

Waterbuffer

Roadbuffer

Urbanbuffer

All wildelife shit

Negative Buffer layers:

All of the wildlife shit

**Combine these to get a single buffer layer:**

if(isnull(mwaybuf),0,mwaybuf)+if(isnull(railbuf),0,railbuf)

Combine all negative buffers together.

**Reclass Layers:**

Landcov = landcost

Soil-type =soil-cost

Landcov= Grade3(Land that doesn’t cost much to tear up so anything from grass and shit to whatever)

**Composite layers:**

Landcost+soil type = cost-surface