A Landfill’s Modern Maturity
A case for increased paths and safety in Danehy Park

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Danehy Park is a 50-acre recreational facility located in northwest Cambridge, MA. The site was first a clay excavation pit and then a municipal dump. In the 1970’s and through 1990, the park was capped and transformed into a park. Now, Danehy Park is home to multiple athletic fields, playgrounds, and over a mile of biking / running trails.

It has been 30 years since Danehy Park opened and many modifications have been made to the park since. And annually, new proposals are being made, many of which want to make Danehy safer for its users. The purpose of this study is to determine what areas are safe or unsafe within Danehy Park. I used input from interviews I conducted with officials from the City of Cambridge for my thesis to create a spatial suitability analysis. Drawing from my own observations of how the park is used, I make a case for why transforming the methane gas vent trenches into active paths would increase safety and use within Danehy Park.

Methods
1. Edit out inaccuracies and crop to size the input layers for seating/picnic tables, paths, and trees.
2. Use the buffer tool to determine accurate thresholds for safeness based upon park and interview observations.
3. Use viewshed tool to quantify visibility from paths via a DTM elevation layer calculated from LiDAR data.
4. In ModelBuilder, create euclidean distance rasters for seating, trees, and paths. Reclassify each layer, including viewshed, to the pre-determined safety thresholds and implement a weighted overlay (values in table below). The output is a suitability model.
5. Cross-reference the suitability model results with park observations and photos.

Analysis & Conclusions
Based upon my results, I can conclude that my suitability model reflects where the City of Cambridge has put an emphasis on safety. Figures d, e and g show areas where safety infrastructure has been installed to discourage unwanted behavior. Figure d shows the central path to the park, which operates as a 24-7 public ROW and is constantly patrolled by police. Figure e shows picnic tables, whose maintenance are believed by the staff to promote safety and order. Figure g shows a walking path which, once installed, decreased people congregating there at night.

- Highlights the periphery as unsafe. Figures a and c show how the outside of the park are the least safe areas due to lack of visibility or presence of safety infrastructure. In a way, this is intentional. The park was designed to have a methane gas vent trench around the circumference. It was placed out of viewshed, to the pre-determined safety thresholds and implement a weighted overlay (values in table below). The output is a suitability model.

- Accurately shows neutral zones. A majority of the beige, neutral safety zones are athletic fields like the one shown in figure f. I did not account for athletic fields in my model because their presence did not come up as a deterrent nor an encourager for unwanted activities. Still, the model was not too sensitive as to depict these areas as dangerous.

Now that is has been 30 years, Danehy Park could take another step in its maturity. Landfill remediation data suggests that the majority of the methane has escaped. The City could transformed the trenches into walking paths, increasing monitoring and recreation (figure b).