**Q1: The Clustering Result**

As you mentioned in your email, the clustering analysis in my model paper seems a bit implausible, as it seems to be mainly related to distance from the city centre. Yet, there is no such metric as 'distance from the city centre' used in the node, place, and design dimensions.

This cluster analysis attempts to find characteristics of stations in terms of absolute values of the dimensions and the degree of difference between the three dimensions and represent them in clusters. In the authors' interpretation, the five different clusters differ in the balance of the three dimensions, for example, one high and two low. However, the 3D visualisation of the clusters in the article shows that the five clustering factors are arranged approximately linearly in three dimensions. And they are not clearly distinguished from each other, with the closer to the centre, the higher the score on all three dimensions.

I think this clustering analysis is somehow evidence that London is a 'monocentric' city and that if the city had more than one centre, the clustering results might be different.

**Q2: Why Betweenness Centrality?**

You asked me in your last meeting that there was something weird about using the Betweenness algorithm.

After reading the model paper carefully, I found two reasons why she used Betweenness. Firstly, a study has shown that Betweenness is more stable in the face of attacks than other algorithms (I don't understand this reasoning). The second is that other studies have used this algorithm in railway systems, such as Professor Chen Zhong's, who has used it before. Also, in another separate article discussing the application of centrality algorithms in transportation, the authors argue that Betweenness can be used to extract the strength of transport carried by a node. However, I think there are problems with applying, which I will mention later.

**My Thoughts about the Model:**

The authors of my model paper argue that the Node-Place-Design model represents a Regional-scale assessment. The centrality represents a System scale assessment. By comparing the differences between the two models, they can identify some neglected or overestimated areas.

However, this model is still not perfect, so I have constructed what I think is a relatively better model in the PPT. **Please look at the attachment pptx file in the email** (the components marked in bold red in the PPT are the components I have added based on the model paper).

**I will then explain the thinking behind this.**

Firstly, the model comparison in the mod paper is not equal. In the NPD model, we evaluated three dimensions of the stations; in the network analysis, we evaluated only one dimension of the station's performance, i.e., its transport intensity in the overall system. Such a comparison is not meaningful, and I think there is a need to compare two scales on each dimension.

Is there a way to assess how well a site performs in terms of activity intensity? I think it could be represented by Degree centrality, which represents the number of people entering and leaving a node, i.e., the more people entering and leaving the station, the higher the degree centrality of the station. It reflects how many people are active around the station and the actual activity intensity of the station.

I do not have many ideas about the Design dimension yet, and I'm not sure how it would be represented on the system scale, so I'm considering whether to just keep the traditional NP model.

Secondly, although there is some bite, I feel that the distinction between the Regional and System scales in the model paper is somewhat inaccurate, as the two scales use different data sets. The NPD model data reflects the attributes of the stations of the rail system and their surrounding land use and design attributes. In contrast, the network-centric smart card data reflects the population's actual use of the rail system stations.

In my view, the two are more of an 'expected result' versus a 'practical result', though I think the contrast between these two aspects means pretty much the same as in my model paper.