# GIS vs The City Council - Data Analytics, Collective Intelligence and Policy Dust-ups

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**Summary**

The paper outlines the ongoing role that the GIScience toolkit is playing in contributing to a community-based collective intelligence effort challenging proposals on a new secondary schools admissions system in Brighton and Hove, England.

**KEYWORDS:** Schools, Spatial Analysis, Brighton and Hove, Collective Intelligence

## 0.1 Introduction

This paper explores the role of data visualisation, spatial analysis and modelling in developing an evidence base for a community collective intelligence (Mulgan, 2018), and how this can be used to directly challenge poor decision-making and disruptive policy proposals - generating a direct line to the policy makers themselves, the local and national press, and national institutions, while at the same time unearthing a intriguing story arc of personal ambition, ulterior motives and political chicanery.

The case study is Brighton and Hove City Council's (BHCC) recent attempt to re-organise secondary school admissions in the city. The case-study highlights the crucial role that open scientific practices and rapid online publication can play in helping communities better understand complex issues while at the same time underpinning and galvanising a local collective intelligence leading to the self-organisation of a community resistance movement, challenging those in power and the decisions they make.

## 0.2 Background

Brighton and Hove has been something of a curiosity case study for education-focused journalists and academics over the years as its secondary school admissions system is already quite different from (and arguably more progressive than) every other local education authority (LEA) in England (Millar, 2017) (Allen et al., 2013). In October 2024, without fanfare, BHCC launched a public

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engagement exercise where they solicited opinions from the public on proposals to change secondary school admissions in the city. The Council is the admission authority for the community schools in Brighton and Hove (a rare example of a local authority where most schools are still under council control and have not been academised), and is required by section 88C of the School Standards and Framework Act 1998 ("the SSFA 1998") to determine its admission arrangements in advance of each school year, but has a statutory duty to consult with the public on any changes it wishes to make. The proposals included reducing Pupil Admission Numbers (PANs) at several schools in the city and redrawing catchment boundaries. The council's stated aims were to improve educational outcomes for disadvantaged pupils and to ensure that all schools in the city were viable in the face of a projected decline in the overall numbers of students in the city over the coming decade. The outcomes that the public saw were hundreds of pupils artificially barred from attending their local schools and funnelled to declining schools on the geographic periphery of the local authority in order to make them financially viable.

### 0.3 From Evidence Gap to Resistance Movement

The public were told that they had just three weeks in the initial engagement phase, to comment on three proposed catchment boundary changes and reductions in intake numbers at a number of the city's popular schools. They were told that following this the council would consider the response and then formulate a proposal to be considered in a formal Public Consultation phase preceding a full decision. However, the Council failed to supply the city with the kind of supporting information that would be required to make informed contributions.

As an affected parent and academic with the skills to contribute information to the void, the opportunity presented itself to participate in a meaningful way and potentially assist the council in better understanding their system and supporting better policy. Over the initial 3-week engagement period, a series of research briefings were rapidly published online via Quarto and github pages (Dennett, 2024b, 2024c, 2024d) and promoted through a Facebook page co-opted by the council for engagement activities. To date the pieces have been viewed 6,528 times by some 3000+ active users.

The research outputs shone a light on issues such as PAN reductions being proposed for popular schools but not low-demand schools; the challenges of the spatial distribution of schools relative to student populations; and the fact that some of the proposals would see students travelling from the centre of the city to a remote school in a village 8km to the east. Subsequent research briefings called into question the entire premise and weak academic foundations of the central argument being used by the council (Dennett, 2024a).

The community were able to coalesce around the findings, which for many confirmed their suspicions that a full evidence-base had not been considered and the outcomes might negatively affect a large number of families. A group of families in the centre of the city whose children now faced the prospect of being sent to a school miles from their home, started a WhatsApp community which rapidly grew to some 500 members, out of which sprang a self-organised "working group" of academics, software developers, teachers, school governors, lawyers, marketing professionals, civil servants, charity and third-sector workers, a mechanic and others. The group, which became known

as the "Parent Support Group" had a single organising principle - **School kids need community, *not* commuting.**

What followed were numerous meetings with Councillors and Council Officers; radio interviews, podcasts, news stories [Booker-Lewis (2024b)](Carden, 2024) and newspaper articles (Booker-Lewis, 2024a) ; a social media campaign, online spats; memes, satirical songs (Gully, 2024); and, sadly, legal action. Underpinning everything, however, was a stream of rapidly produced evidence grounded in common GIScience methods. Unfortunately, as the weeks passed and meetings with councillors and council officials took place, with evidence presented and expertise proffered, it became clear that as the evidence did not support the proposals, for the architects it was not a welcome addition to the political process. Some key contributions to the debate are outlined below.

## 0.4 Key GIScience Analysis Contributions to the Debate

### 0.4.1 Challenging the attainment gap narrative

One early justification for the radical proposals was that Brighton and Hove was doing badly for its disadvantaged students, it had an unusually large attainment gap and this this justified a radical shake up.

However, upon scrutinising the evidence and analysing the national picture, this was not the case. Levels of attainment for advantaged and disadvantaged students at the Local Education Authority level are not normally distributed and distorted by London. Using the correct median (the council had used the mean in a skewed distribution) the city is actually doing better than the national average for both disadvantaged and non-disadvantaged students. Any attainment gap is a function of non-disadvantaged students having some of the highest attainment in the country outside of London.

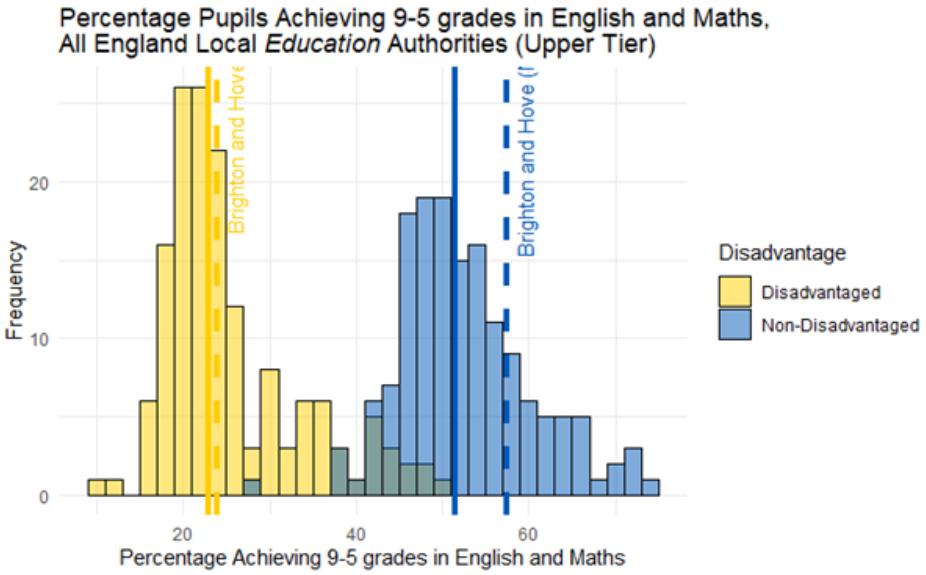



Figure 1: Frequency Distribution of Disadvantaged and Non-Disadvantaged Attainment, Local Education Authorities, England, 2022-23

### 0.4.2 School demand

A crucial piece of the puzzle was understanding how demand for schools mapped on to proposed changes (or not) to school PANs. BHCC publishes the numbers of applications and offers for each school each year, but has done so via static web-pages and PDFs - nowhere was a time-series available. AI tools were used to parse images from PDFs, to generate a useable database of time-series of applications and offers for each school in the city. The plot below (taken from this piece) reveals that one of the city's lowest intake schools, Longhill, seen its intake decline for a decade and has always been well below its headline capacity (PAN). PAN levels are important as a school's income is linked directly to its number of students, with artificially high PANs in one school leaching potential capacity from others, affecting their viability.

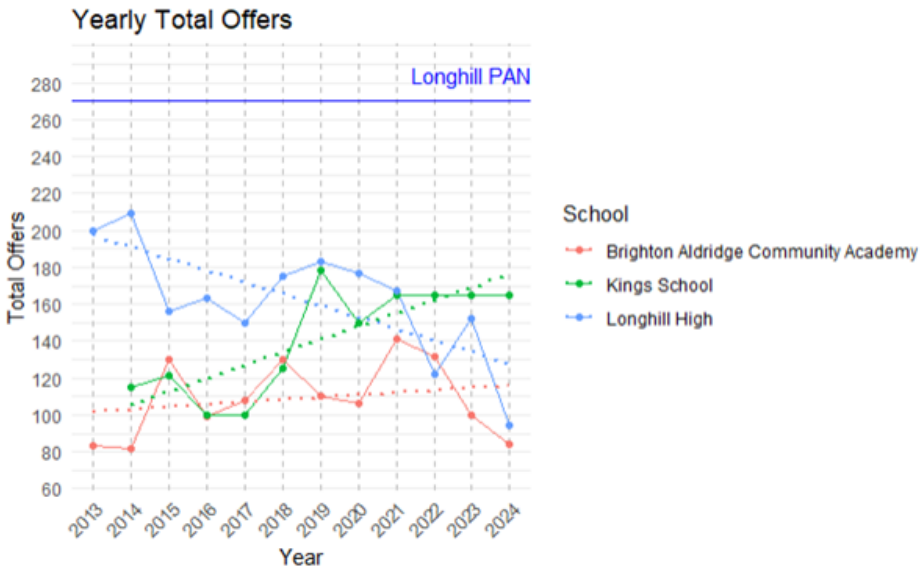
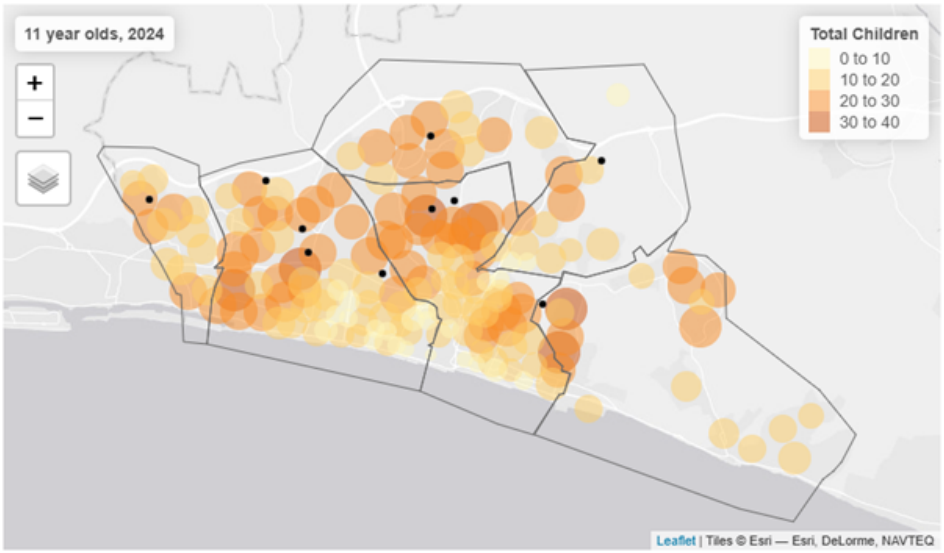



Figure 2: Offers Made, 2013-2024, Three Lower-Intake Schools, Brighton and Hove

### 0.4.3 Spatial configuration of schools and students

To confirm the hypothesis that Longhill school was simply too large and in the wrong place, a simple spatial interaction / gravity model ('Brightopia') was constructed using counts of students in LSOAs, a distance matrix using the OSM road network and travel times estimated using `R5R` and the locations of schools. Setting each school to have identical attractiveness values was a useful method to show simply the spatial effects on the system. Running a model with Longhill in its current location and then a hypothetical new location in the near-east of the city produced starkly contrasting results: the school shifts from being the least popular school in the city to the most popular. This evidence sparked new conversations with councillors and the community around a long-term plan for relocating the school.




| School | PAN 2024 | Model Estimate | Surplus/Deficit |
|---|---|---|---|
| Varndean School | 300 | 266 | 34 |
| Dorothy Stringer School | 330 | 255 | 75 |
| Longhill High School | 270 | 359 | -89 |
| Blatchington Mill School | 330 | 257 | 73 |
| Hove Park School and Sixth Form Centre | 180 | 302 | -122 |
| Patcham High School | 225 | 217 | 8 |
| Cardinal Newman Catholic School | 360 | 349 | 11 |
| Brighton Aldridge Community Academy | 180 | 154 | 26 |
| Portslade Aldridge Community Academy | 220 | 192 | 28 |
| King's School | 165 | 208 | -43 |

Figure 3: 'Brightopia' Model (Longhill Relocated) - PAN 2024 vs Model Estimates (Distance only model)

### 0.4.4 The role of disadvantage vs absence in school-level attainment

A final big contribution to the narrative was around the importance of disadvantage and social mixing in educational outcomes. Following the initial engagement exercise, despite clear opposition from the public for the idea of forcing students to travel across the city to attend schools, a new 'open allocation' priority was introduced for the statutory consultation, essentially giving students from outside of a catchment a higher priority than those inside it who did not have a sibling link

at the school or were not eligible for Free School Meals. The next effect for over-subscribed central catchments was to displace large numbers of students (some 10% of the total students in the city) via giving higher priority to any out-of-catchment student up to 20% of a school's total places.

The justification offered by the council was to create more social mixing, justified by a weak effect linking levels of disadvantage to attainment at the school level to attainment in a paper by (Gorard & Siddiqui, 2019). In analysing school level data for England, it was possible to demonstrate a non-linearity in the relationship between concentrations of disadvantage and attainment which meant that for the levels of deprivation experienced in Brighton and Hove, no positive effect on attainment was likely to occur for any school level chances in disadvantage, further more, we were able to show a much stronger relationship between attainment and persistent absence - an issue of particular relevance for the city which experiences far higher persistent absence rates than other LEAs in England.

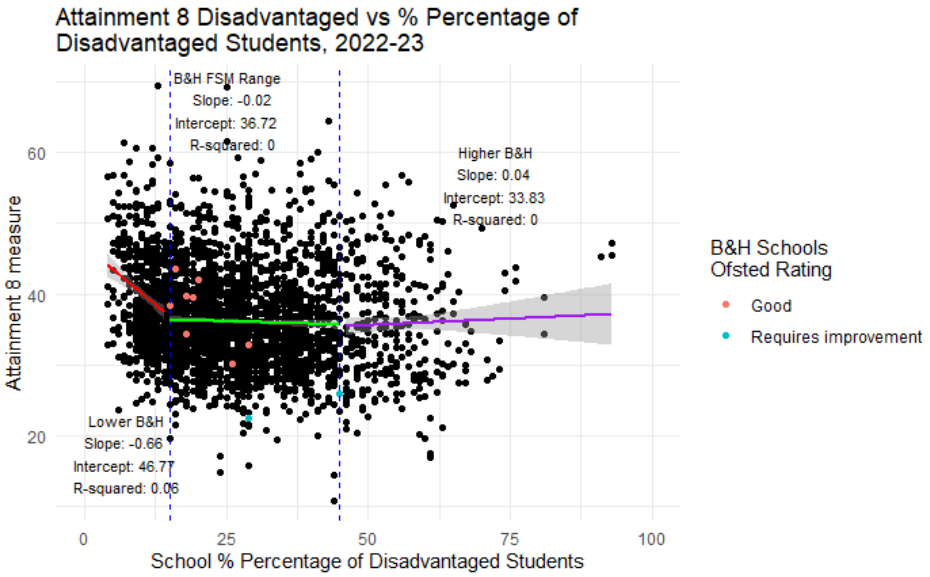



Figure 4: Attainment 8 vs Disadvantage, All State Secondary Schools, England, 2022-23

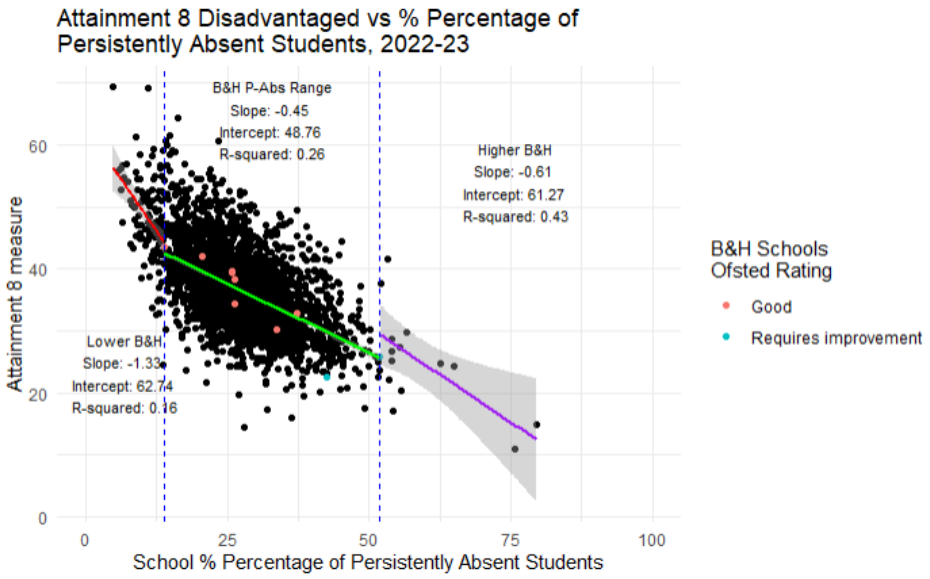



Figure 5: Attainment 8 vs Persistent Absence, All State Secondary Schools, England, 2022-23

## 0.5 Conclusions

At the time of writing, it is still unclear whether the weight of new evidence presented to the council and the city alongside meetings with politicians and advocates for different sides of the argument, presentations, social media campaigns and debates, newspaper articles, will lead to a change in policy.

One of the unique features of this entire process in Brighton and Hove is unlike the experience of most academics who have worked with policy and decision makers; rather than interactions being collaborative with evidence being used in a formative stage to help shape better policy, this has been the opposite. Policy came first and the interactions with the policy makers have been combative. Evidence has been used to counter claims and challenge decisions which do not have the support of the whole city.

What is clear is the role that the modern GIScientist toolbox has played in helping galvanise a social movement and support a concerted challenge to contentious policy in a city.

## 0.6 References

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## Biographies

Adam Dennett is a Professor of Urban Analytics in the Bartlett Centre for Advanced Spatial Analysis, University College London and current professional thorn in the side of Brighton and Hove City Council.

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