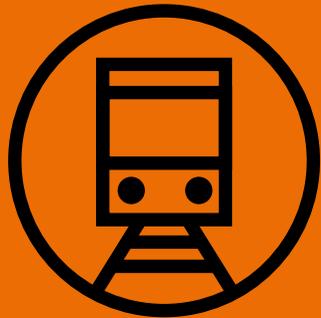


elliottwood



Our Transport Services

**Engineering a
Better Society**

Transport

Our Services

At Elliott Wood, we understand the link between transport, land use, sustainability and economic growth. Our aim is to support our clients in maximising the value of their assets, while minimising the environmental impact and enhancing our community's health and quality of life.

Our Engineers and Transport Planners work in all the key sectors, including residential, commercial, leisure, retail and education.

Our team help all types of landowners to improve multi-modal access to their properties. We do this by devising cost effective strategies that optimise different modes of travel, from walking and cycling, to public transport and car use; maximising the benefits of low carbon solutions, new technologies and transport innovation.

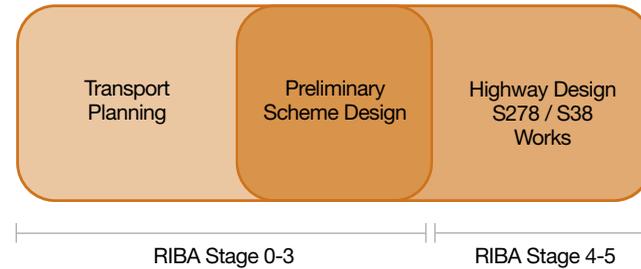
We combine our expertise in planning and design to advise on all transport aspects of a development. We can therefore quickly identify the transport factors that are critical to the success of a project.

We use our knowledge to assess feasibility so our clients can make informed decisions to progress opportunities, inform building design and masterplans and support planning applications. We are therefore able to support clients from the initial feasibility study through to completion, including the detail design of highways improvements.

Our key services include:

- Transport Masterplanning & Placemaking
- Feasibility Studies / Site Access Appraisals
- Transport Assessments
- Transport Statements
- Delivery and Servicing Plans
- Construction Logistics Plans
- Travel Plans

- Car and Cycle Parking Studies
- Environmental Statements
- Public Consultation
- Highway and Public Realm Design



Transport Planning & Placemaking

Accessibility and connectivity are critical factors that can affect the potential of a site. Our team devise transport strategies with placemaking in mind, turning spaces into accessible places.

By moving away from a heavy reliance on private car ownership, space with sites can be unlocked to be better utilised and deliver benefits to not only the developer, but also the future building users and the local community.

In a similar manner, our critical thinking also applies to the review of the latest sustainable transport guidance as, for example, the provision of cycle parking does not necessarily increase the cycling mode share.

We support our clients through the design and planning application stages, providing compelling solutions and documentation to assist negotiations with planning and transport authorities, leading to planning consents.

Our unique approach to transport planning see us focussing on masterplan development from the earliest project stages to ensure that transport related greenhouse gas (GHG) are minimised from the outset.

Transport Carbon Impact Assessments

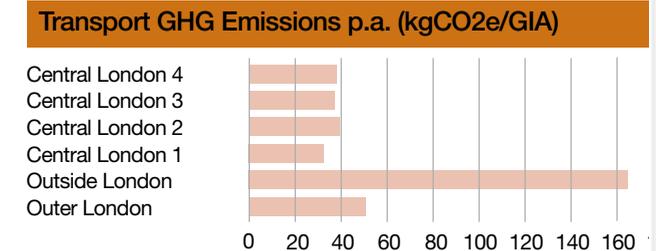
We are passionate in our pursuit for sustainable transport solutions and engineering a healthier, happier and more resilient society. To this end, we have developed a Transport Carbon Tool that forecasts the carbon impact of personal, business and operational vehicle travel to a site.

We model the GHG emissions of transport activity at developments. This enables us to forecast the likely carbon impact of travel by each mode of transport and type of activity. This allows clients to understand their likely transport carbon impact for Carbon reporting, and which areas to focus resources on in order to reduce the overall transport carbon impact at a site.

This scheme releases carbon equivalent to the below

- 256 tCO2e per annum
- 27.6kg CO2e / sqm GIA per annum
- 253 one-way flights between London and New York
- 126 people's consumption of meat, dairy and beer for 1 year
- 107 average family cars running for 1 year

Working with our structural engineers, we are able to assess the impact of various design options e.g. the embodied carbon impact of cycle infrastructure and/or placing cycle parking and its associated lockers, showers and changing facilities in a basement versus ground, first or mezzanine floors.

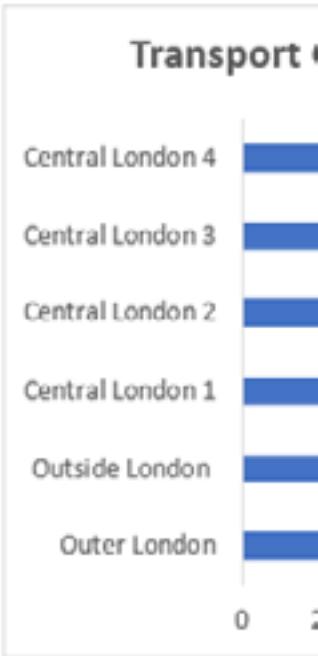


Highway Design

Our team is experienced in undertaking highway design, contractor appointment and site supervision and monitoring.

In procuring highway and drainage works using S278 and S38 highway agreements, S184 Licence and/or S104, S105 and S106 drainage Agreements, we help navigate the legal process.

The relationships we have forged and knowledge of local authority standards, enable us to obtain approvals efficiently working to meet the project needs.



Transport GHG Impact – Office Case Study

Introduction

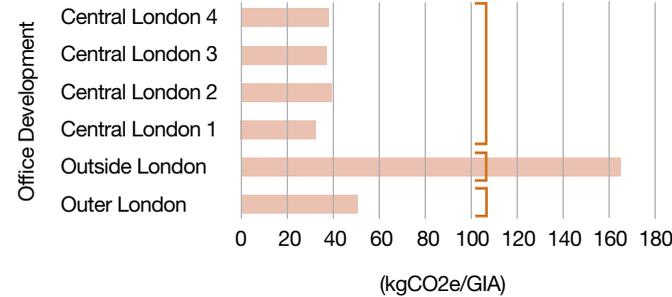
The transport sector is the biggest contributor to greenhouse gas emissions (GHG) in the UK – contributing 27% of all emissions. Elliott Wood modelled the GHG emissions from transport at new office developments and compared this with the embodied carbon (modules A, C, D) and operational carbon (module B) impacts.

Transport Carbon Impact

Using our in-house Transport Carbon Assessment Tool, we modelled the following:

- Transport related GHG emissions (tCO₂e/GIA) for five office developments across London and one in Luton by mode of transport and type of activity (see Figure 1).
- The transport emissions were then compared against the embodied carbon calculations for each building, and an estimate of the operational carbon based on 55kwh/GIA of electricity use per annum (see Figure 2).
- The impact of office developments in each London Borough was then modelled for comparison purposes (see Figure 3).

Figure 1:
Transport GHG Emissions p.a. (kgCO₂e/GIA)



Summary of Findings

- The transport related GHG emissions of the office buildings in Central London, Outer London and Luton were 35, 51 and 164 kgCO₂e/GIA, respectively.
- Office buildings in Outer London typically generate 46% more transport related GHG emissions than office buildings in Central London, while office buildings in Luton (outside of London) typically generate 222% more transport related GHG emissions than offices in Central London.

- The increase in transport related GHG emissions from Central London is primarily attributed to the higher proportion of car drivers and greater travel distances relative to the sites in Central London.
- Over a 20-year period, the transport related GHG emissions would make up 45% of the total emissions of an office building in Central London, 54% in Outer London and 79% in Luton.
- Assuming 600 kgCO₂e/GIA of embodied carbon and 55kwh/h of operational carbon per annum in office buildings, with only the transport related GHG emissions changing, an office building in Outer London would typically generate 21% more GHG emissions than an office building in Central London, while an office building in Luton would generate 166% more GHG emissions than an office in central London.
- The location of office buildings play a key role in the level of transport related GHG emissions.

Figure 2:
Source of GHG Emissions at Typical Office Buildings

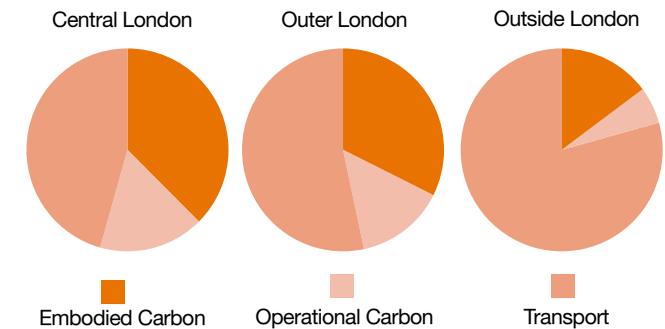


Figure 3:
Impact of Office Location on Transport GHG



KgCO ₂ e/GIA	Low (>=)	(<) High
1	33.5	45.1
2	45.1	56.7
3	56.7	68.3
4	68.3	79.9
5	79.9	91.5

Note: using 10,000 sqm GIA office per London borough

Cycle Parking – Challenging the Standards

Introduction

In January 2021 Bournemouth, Christchurch and Poole (BCP) Council adopted a new parking Supplementary Planning Document (SPD), which increased the cycle parking requirement for residents in new developments from one space per unit to one space per bedroom, resulting in a 50% increase in long stay cycle parking relative to the 2014 SPD and 2020 Consultation Draft requirement.

Our investigation into the change in the cycle parking standard and what it means, spatially and environmentally, is discussed below.

BCP Transport Policy

The cycle parking standards in BCP's Parking SPD (July 2014) was based on surveys undertaken in Oxford in 2006, as described in Section 8 of Manual for Streets (MfS). Para. 8.2.7 of MfS states, "When assessing the effect of location, census data on the proportion of trips to work made by cycle provides a useful proxy for assessing the likely level of cycle ownership".

The surveys showed that the average ownership rate of bicycles for flats in Oxford City at the time was 48% (0.97 per flat), while that for houses in Oxford City was 73% (2.65 cycles per dwelling). The cycle parking standard for flats in BCP Council was set at a minimum provision of 1 space per unit as a result.

Cycle Statistics

Census 2011 Travel to Work Statistics

- 5% of residents in Bournemouth County and 4.2% in Central Bournemouth cycle to work.
- The Census predated bike share schemes.
- 2021 Census data is not currently available but would not provide useful data as the Census occurred during Stage 3 lockdown.

National Cycling Statistics (DfT Table CW0302)

- According to the Department for Transport (DfT) Table CW0302, Cambridge and Oxford have the highest and second highest cycling rates in the UK. Both have seen reductions in cycle usage over the past 5 years, despite increases in cycle parking standards.
- 51% of people in Cambridge cycle for any purpose at least once a month, while 42% cycle at least once a month for trips to work. This broadly correlates with para 8.2.7 of MfS.
- The three factors playing the smallest role in preventing them from cycling are lack of cycle parking at work, indirect route and lack of storage for a bike at home.

Summary

- There has been an increase in cycling in Bournemouth since 2011, with the national and local figures for all cycling ranging between 17.4% and 23%, and lower cycle for work figures.
- Cycle ownership in Oxford is in line with the cycle statistics for the area [DfT Table CW0302], thus supports the statement in MfS that the percentage trips by bicycle for work trips provides a proxy for cycle ownership.

Bike Share Scheme

An extensive Bike Share scheme is operational in Bournemouth, operated by Beryl bikes, which provides everyone (except those requiring adapted bicycles) with access to a bicycle or e-scooter.

Data provided by Beryl shows that 60% of journeys on their hire bikes are between 1-3km in length, making them a convenient travel choice.

Chapter 6 of the BCP Local Cycling and Walking Infrastructure Plan (LCWIP) states the following about the Bike Share scheme:

"Demand has far exceeded expectations, with over 500,000 journeys undertaken in 2 years. Surveys have shown that 33% of trips replace a car, motorbike or taxi journey, so the scheme has already removed over 165,000 vehicle trips from the congested local road network. In addition, Bike Share gives a low-cost option for transport for journeys to work, with regular users charged just 5 pence per minute for their journey. Future developments will include expansion of the scheme in partnership with Dorset Council, plus the introduction of e-bikes into the fleet."

The Beryl Bike cycle hire offers a convenient, low-cost alternative to owning a bicycle for those who cycle less regularly or do not want to own a bicycle (due to concerns over theft/vandalism or maintenance and insurance costs etc).

Cycle Use at Existing

Surveys of the cycle use at five BTR and student residential developments across the UK were undertaken in March 2022.

The surveys showed that the typical uptake of cycle parking spaces within the BTR/student accommodation was 3%-5% of units, with only one of the five schemes recording 20% of units using on-site cycle parking.

Cycle Parking – Challenging the Standards (cont.)

Forecast Cycle Use

Propensity to Cycle Tool (PCT)

The Propensity to Cycle Tool (PCT) for England and Wales, funded by the DfT and the Welsh Government, provides an evidence-based approach to inform cycle investment in England and Wales by helping local authorities decide where to prioritise investment and build cycle infrastructure.

The PCT notes the baseline for cycling in Bournemouth at 5% (2011 Census), with the Government Target (Market Rate) scenario at 8%, assuming a 3% increase in regular cycling (60% increase in cycle trips) resulting due to the delivery of new cycling infrastructure.

The 'Go Dutch' scenario forecast that 23% of residents could cycle to work under this scenario, with highest achievable cycling rate, 'Ebikes', forecasting that 31% of residents could cycle to work under ideal conditions.

Case Study Example

A residential development of 400 flats / 600 bedrooms with an average occupancy of 1.8 people per unit would result in 1,080 residents at the development.

Applying the 2021 BCP cycle parking standard would provide cycle parking for 56% (600/1080) of residents, while the 2014 BCP cycle parking standard would provide cycle parking for 37% (400/1,080) on-site. In addition to this, residents would have access to Beryl Bike hubs within a short walk, providing additional capacity.

The above shows that both the 2014 and 2021 SPD standards will result in an overprovision of cycle parking spaces based on the forecast cycling demand, even before the impact of shared bikes is considered.

Embodied Carbon Impact

Based on BCP's cycle parking design standards, the provision of 600 cycle parking spaces would require a minimum floor area of 1,153 sqm and that for 400 spaces 768 sqm. This is 13% larger than the space requirement had the scheme been in London given the large cycle space and aisle spacing requirements in BCP.

The forecast cycle demand in Bournemouth is expected to be a maximum of 23%. Under ideal conditions this would increase to 31%. If this included anyone that cycled at least once a year (assuming they owned their own bicycle and did not use a publicly available Beryl Bike) this may increase to 35%. Under all these scenario, the future cycle parking needs of residents in the building would be met by the 2014 BCP Parking Standard. Cycle provision in excess of this figure is thus considered an overprovision, as the cycle parking will never be used.

The embodied carbon impact of the building under consideration is 600 kgCO₂e/GIA, thus the impact of the overprovision of cycle parking would result in roughly 0.23 tCO₂e being emitted into the atmosphere for infrastructure that will never be used. This is equivalent to 1,002 return flights between London and New York. This excludes the impact of the operational energy required within this space over the lifetime of the building, which would roughly equate to the embodied carbon impact of the structure, thus doubling the impact of the overprovision of space.

Conclusion

Providing cycle parking to support an increase in cycle use is essential to reduce the UK's overall GHG emissions. It is also important to provide all users of a building access to a bicycle and accessible, secure cycle parking.

Cycle parking should, however, be provided based on the forecast future demand and not the ability for every person to own as bicycle, as this is unlikely to occur (particularly in large buildings in accessible locations). It also needs to take account of the accessibility of a site and access to micro-mobility schemes, which provide an alternative to owning a bicycle.

The BCP 2014 SPD cycle parking standard would provide sufficient cycle parking to accommodate cycling growth under the best case scenario. In addition, the Beryl share cycle scheme provides residents with access to a bicycle, without the need to own one. Based on the evidence, the 2021 SPD standard will overprovide cycle parking, with a negative impact on the environment due to the embodied carbon and operational carbon impact of the overprovision of the floorspace required to house the cycle parking.

Figure 1: Cycle Parking Demand vs Cycle Parking Standards

