

The Oxford-Cambridge expressway. An analysis of the 'aspirational development' modelling in the Corridor Assessment Report of 2018

'All models are wrong, but some are useful'. G.E.P. Box 1919-2013

Summary

- The Oxford-Cambridge Expressway, and the associated "Arc" of development along it, are seen by its advocates as an opportunity for 'transformational growth' for the region.
- This document describes that part of Highways England's Oxford Cambridge Expressway Corridor Assessment Report (CAR) which calculates the amount of new housing development, workers and jobs that might be facilitated ('un-locked') by building an expressway between Oxford and Cambridge¹.
- No precise route for the expressway is described in the CAR, but 13 junctions for it are imagined in preferred Corridor B (the focus of the present document). This is about one junction per 12kms of expressway (total expressway distance between Oxford and Cambridge is c. 148kms).
- The model for development in the Corridor Assessment Report is vehicle-based (cars, vans, lorries) and assumes that the amount of new, expressway-facilitated development is ultimately limited by the capacity of each expressway junction to handle peak-time traffic.
- The first step is to calculate the number of new houses that will be built around each junction (up to 4kms away) arising from all approved Local Plans (which, in Oxon's case, run to the mid 2030s). This is referred to as the 'reference case'. Between 6,500 and 6,900 new houses per junction will be built under the reference case, with a population about equal to that of Kidlington's (Oxon) in the 2011 census (i.e. pop. 13,723, approx 6,000 houses).
- A traffic model is then run in which the total volume of traffic is based on present day traffic figures plus all the 'new' traffic that will arise from developments already in Local Plans. This model therefore generates the traffic flow at each expressway junction under 'reference case' conditions.
- The 'spare capacity' of each junction is then defined as the difference between 85% of maximum expressway junction capacity (a figure beyond which congestion slows down traffic movement) and the reference case scenario (with a small addition allowing for intensification of existing planned development due to the expressway's presence).
- It is assumed that the spare capacity then determines the amount of additional development that could be 'un-locked' by the expressway. Spare capacity (i.e. of traffic using the junctions) is first turned into an estimate of houses imagined to 'generate' that traffic (using a conversion factor relating vehicles to houses), then of workers inhabiting those houses. This additional development again occurs within 4kms of each junction (a distance corresponding to a 5 to 10 minute journey time).
- The total number of new houses arising from this spare capacity is between 300,000 and 360,000 across the Corridor.
- Thus, the total of reference case plus expressway development involves between 390,000 and 455,000 new houses across the corridor; or between 30,000 and 35,000 houses, equivalent to two new 'Abingdons' or two new 'Bicester's', per expressway junction. This development, however, is not evenly spread along the Corridor.
- A different model is used to predict how many jobs might be generated locally using, as one of the inputs, the development scenario from the CAR. These job figures appear to match very closely the growth in the work force predicted around each junction.
- The land-take of the development proposed in the CAR will raise the proportion of urban coverage around each expressway junction from an average of 14% at present to 33%, assuming the (high) housing densities

¹ The CAR uses the terms 'houses' and 'homes' interchangeably, and this practice is followed here, too.

used in the model (43 houses per hectare, or hph); or the land-take could increase to as much as 43% at housing densities typical of many local plans and rural areas at present (26 hph).

- The effect of East West Rail's (EWR) proximity to the expressway is minimal under the scenarios examined by HE. In fact, because the model assumes (i) travel by train will reduce the use of expressway junctions by cars (people are expected to bus, walk or cycle to the train stations), and (ii) that housing densities can increase near to train stations, the total amount of development actually increases in areas where the expressway and EWR are close together, but only by between 3% and 8%. This small impact of EWR is less due to the fact that EWR is insignificant for development and more due to the fact that a vehicle-based model is not set up to realise the development potential of a quite different form of transport.
- Across the entire corridor, the total number of new expressway houses in the approach used here is, at most, 360,000. This should be compared with the 553,000 new expressway houses proposed in the original NIC document '*Partnering for Prosperity*'. The 'shortfall' of 190,000 will have to be met, if at all, by non-expressway growth across the entire ceremonial counties of the expressway.
- There are very large differences between the amount of development predicted for each expressway junction, from 7,000 workers for 'Abingdon' to 82,000 workers for 'East of Oakley', determined in part by the amount of development already near each junction. Because the objective of the expressway is to unlock as much potential for development as possible, the final selection of Corridor B as the preferred option was in part determined by the sparsely inhabited rural areas in the Oxfordshire/ Buckinghamshire border regions.
- Using Highways England's own figures (1.27 workers per dwelling and 2.33 people per dwelling) a worker population of 82,000 'East of Oakley' means a total population of 150,000, equal to that of Oxford City in 2017 (154,600).
- The large amount of development East of Oakley, and also at the adjacent junctions of 'East of Oxford' and of 'Twyford', make Corridor B3 (totals of 443,000 workers and 475,000 jobs) far more attractive than Corridor B1 (377,000 workers and 415,000 jobs) for expressway development on these grounds alone (i.e. of development enabled by the expressway).
- In the particular case of Oxfordshire, however, because of the large numbers of workers and jobs proposed for 'Wendlebury' and 'South of Bicester', Corridor B1 (5 proposed expressway junctions) enables 145,000 workers and 167,000 jobs, and Corridor B3 (3 junctions) 'only' 88,000 workers and 100,000 jobs.