Public Inquiry

The Network Rail (Cambridge South Infrastructure Enhancements) Order

Objection to TWAO application

Edward Leigh

Ref: OBJ/22/3

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February 2022 v3

Who am I?

Edward Leigh MA MSc

- Leader of **Smarter Cambridge Transport**, a voluntary think tank and campaign group advancing sustainable, integrated and equitable transport for the Cambridge region
- Qualified transport economist

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Why are we objecting?

1. Station design is likely to be too small in the long term to accommodate likely usage.
2. Integration between the railway station and bus services should be much tighter.

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What is a forecast?

What is a forecast?

- Uncertainties in the future – economic, social, political, behavioural, etc – make accurate predictions impossible.
- In general, forecasting seeks the most likely outcome – the outcome with the highest probability.
- But that is just a point on a probability distribution curve.
- **Disagreements about forecasting are really disagreements about the probability of a particular outcome being realised.**

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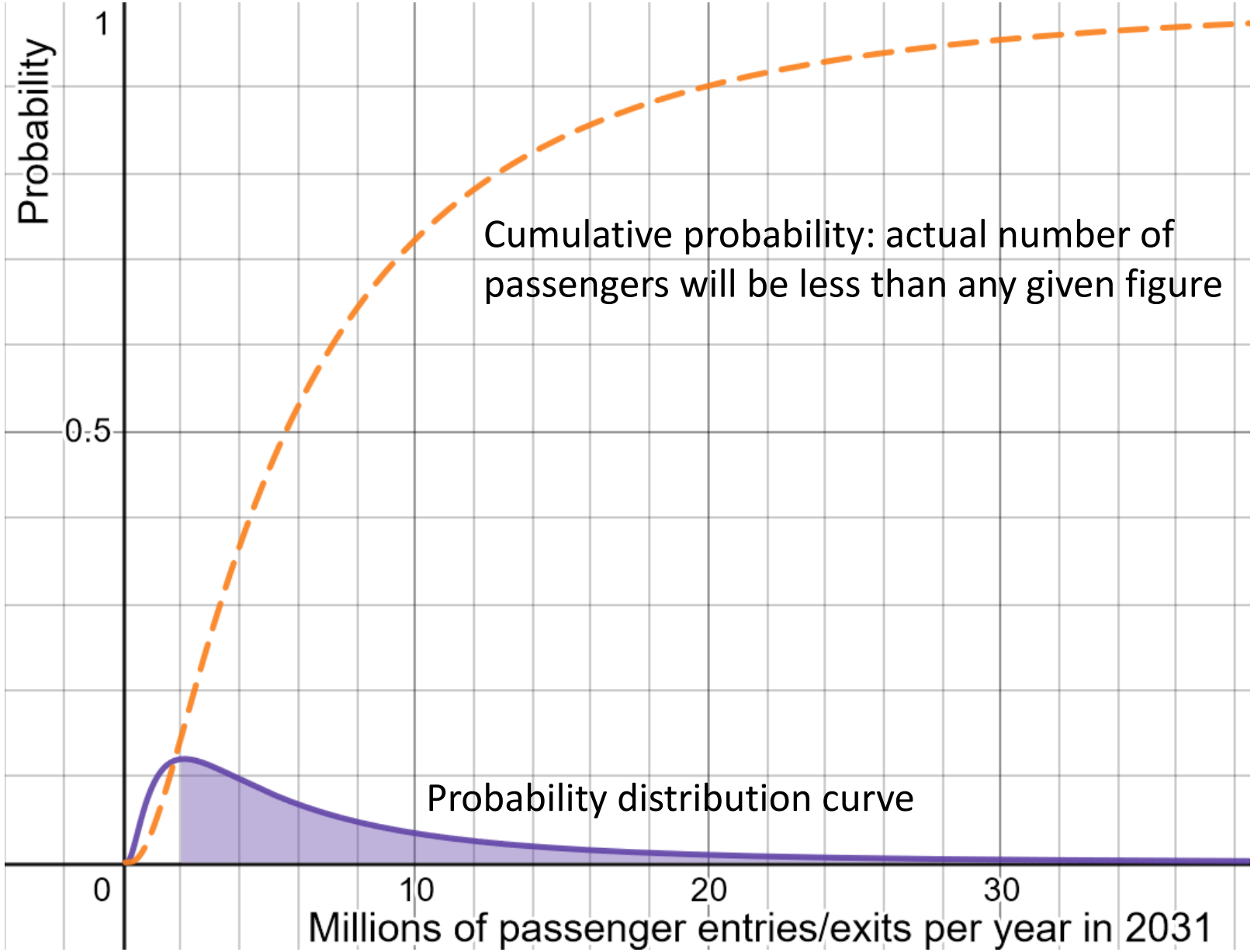
Illustration of a forecast

In this illustration:

- Most likely figure is around 2 million
- Probability it is more than 2 million is 86%
- Probability it is more than 6 million is 47%



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What are the uncertainties?

- Incomplete, out-of-date and proxy data about the present
- Population growth (especially inward migration)
- Jobs growth
- Types of jobs and working patterns
- Future transport policies and their implementation
- Future fiscal policies
- Crude economic models for determining modal choices
- Dynamic effects, e.g. people choose to work or live somewhere *because* there's a new railway station nearby

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What if …

Outturn is lower than forecast?

- The station interior and its approaches will have more space than needed. New Jubilee line stations were generously sized to accommodate future growth. Is Cambridge so different?
- *Capital risk:* more **money and resources may be deployed earlier than necessary**.
- *Revenue risk:* **Operating and maintenance costs are higher**, reducing net revenues. (However, having a single entrance may reduce staffing costs.)
- Lower user benefits ⇒ lower BCR

Outturn is higher than forecast?

- The station and/or approaches will become overcrowded, creating a potential **safety risk**. Cambridge station has experienced these 'growing pains'.
- Traffic backs up and causes **congestion** on Francis Crick Avenue
- Cycle parking fills up, leading to obstructive **fly-parking of cycles**.
- It **costs more** and causes more disruption in the long run to make alterations to the station building or approaches later.
- Higher user benefits ⇒ higher BCR

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Forecasting travel demand

Identify trip start and end points

Trip producers potentially served by Cambridge South

- **Homes**
- **Workplaces** (business travel)
- All trip attractors when an intermediate stop (trip chaining)

Trip attractors potentially served by Cambridge South

- **Workplaces**
- **Schools**
- Shops
- Social, sporting, cultural and leisure venues
- Homes (social visits)

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Quantify current trips

Actual data

- Household and population counts
- Job counts
- School/college pupil counts
- 2011 Census data for homes, workplaces and main travel mode for commuting
- Entry and exit counts for existing stations
- Motor vehicle, cycle and pedestrian counts

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Data limitations

Incomplete and approximate data available

- We have very little data on active travel, chauffeur-driven (pick-up/drop-off), multimodal and chained trips
- Up-to-date commuter data was not available for the Outline Business Case.
- There is no breakdown of hospital patient and visitor trips (by time and mode)
- Geographic zones (MSOAs) are a crude approximation to the actual catchment areas for different modes (and combinations thereof)

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Extrapolate future trips

Synthetic data from growth models

- TEMPro (all travel modes), largely based on national growth rates
- CSRM2 (Cambridge Sub Regional Model – motor vehicles), incorporates new developments in the Local Plans
- MOIRA (rail passengers)

All synthetic data relies on debatable and arbitrary assumptions about the future being like the past, just bigger, or one place being like another.

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Cambridge Biomedical Campus is unique

Cambridge Biomedical Campus is nationally unique, with an ambition to be the country's, indeed one of the world's, pre-eminent centres for life science research and medical care

Nowhere else in the UK could, potentially in 2040, have **40,000 jobs** and **six regional hospitals** within a **15-minute walk** of a railway station.

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Assigning trips to modes

Assigning trips to modes

- Mode allocation is a zero-sum exercise. Every trip must be allocated to a mode (or a combination of modes).
- Modelling, by Network Rail and Atkins (Transport Needs Review) has forecast a large growth in trips by car.
- But, not only is parking and road capacity finite, local policies (of the Greater Cambridge Partnership and Combined Authority) aim to *reduce* traffic in order to reduce congestion, carbon emissions and air pollution.

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Generalised journey cost

The generalised journey cost model of mode assignment

- *GeneralisedCost* =

  MarginalCost + (*JourneyTime* x *ValueOfTime*) + *OtherFactors*
- Journey times includes waiting times and are averaged.
- Other factors may include proxy monetary values for:
  - reliability (journey time variability and cancellations)
  - personal autonomy (can I re-route?)
  - convenience
  - comfort
  - social status

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Assigning trips to modes

- Reasonably good evidence that generalised journey times predict driving routes, in part because people now use SatNavs that employ traffic modelling algorithms to choose routes.
- Little evidence that generalised journey times are a reliable predictor of mode choice.
- Mode choice assignment usually ignores (as it does in Network Rail's modelling) capacity constraints:
  - car parking
  - road/junction throughput
  - number of seats on buses
  - cycle parking
- It also doesn't adequately capture the 'other factors', such as reliability, personal autonomy, convenience, comfort and social status.

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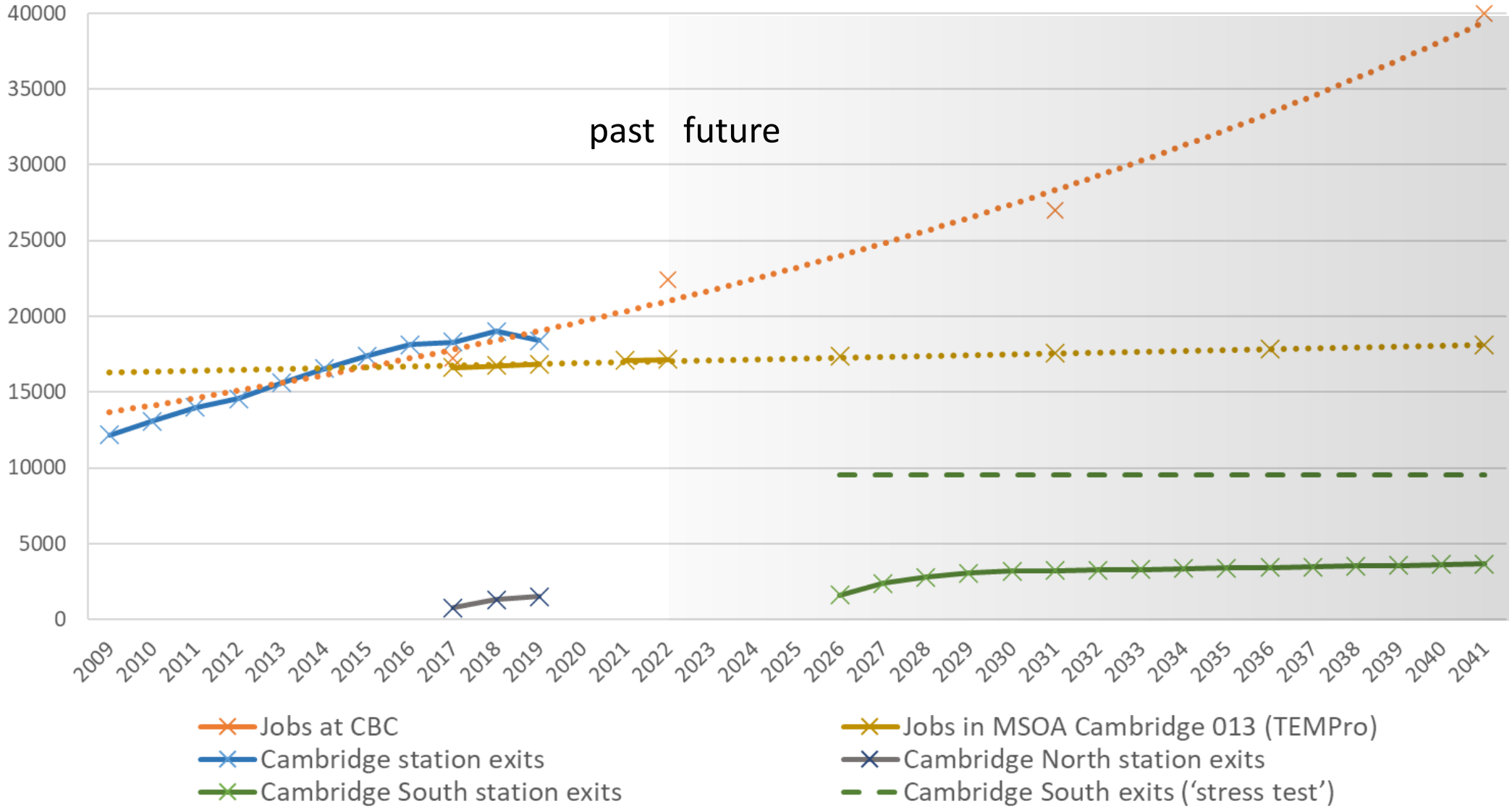
Jobs and station throughput



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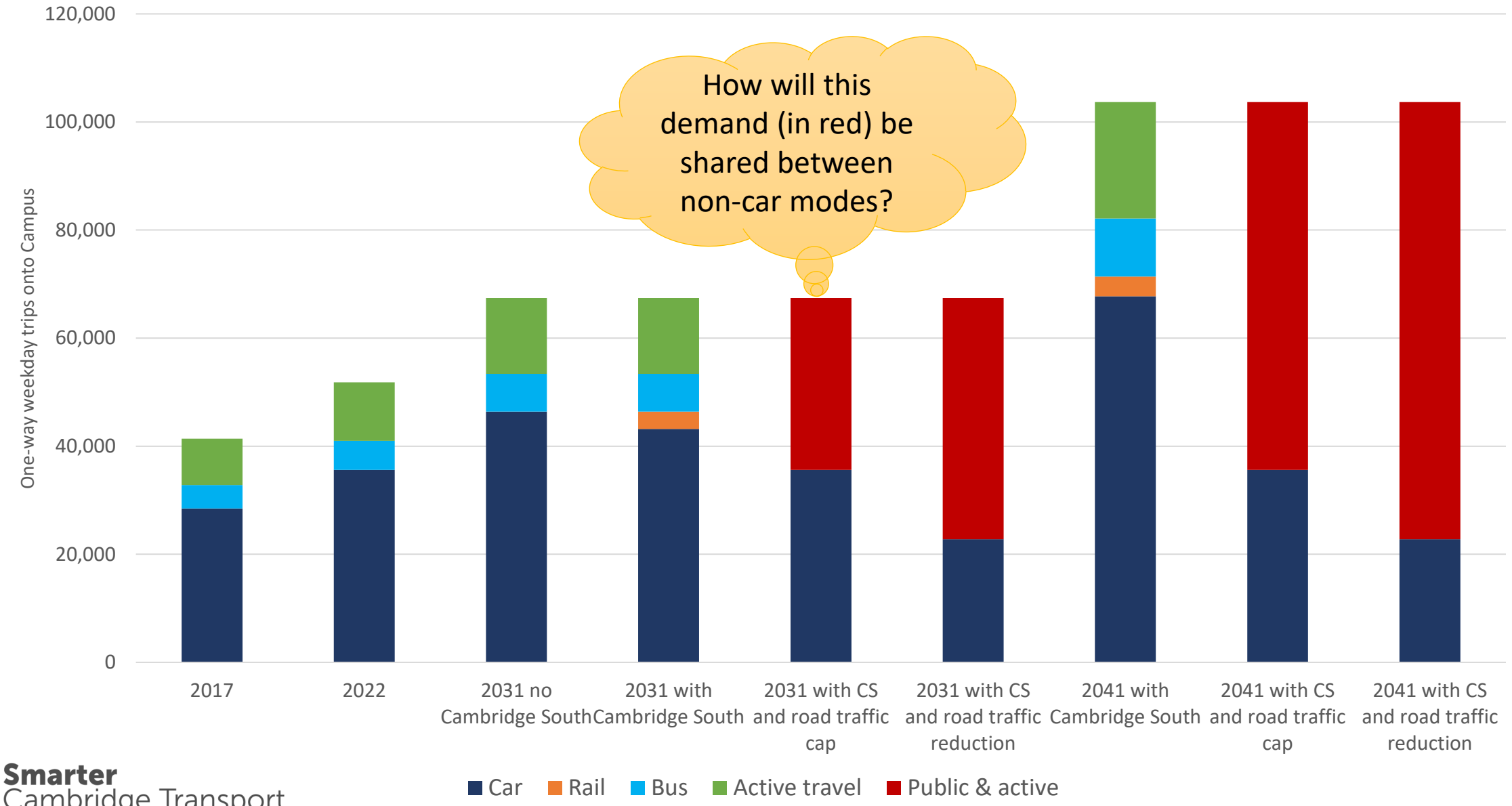
Modal shares at Cambridge South station



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Significant error

NOTE THAT THIS SLIDE REPLACES AND CORRECTS THE STATEMENT IN THE ORIGINAL PRESENTATION.

9.8.4.12 The *Transport Needs Review part 3* presents a maximum scenario replacing the component of the previous forecast indicated to be transfer from the highway network, with an alternative method to estimate mode transfer. We have the following concerns with the approach:

(iv) Section 7.3 The *Transport Needs Review part 3* appears to suggest that the maximum daily abstraction from highway demand is 4,769 one way trips per day. Multiplying this by an annualisation factor ranging from 300-330 would result in 1.4m-1.6m trips annually. Adding this to the forecasts from bullet point 8 above would result in 4.9m-5.4m per year. This acknowledged maximum case forecast is still below the capacity of the station.

9.8.4.13 In light of all of the above, Network Rail is satisfied that the capacity of the station is adequate and that there is no need for the cross checking suggested by CUH.

We originally pointed out 4,769 one-way trips in fact equates to 2.9m–3.1m trips annually (not, as stated, 1.4m–1.6m). However, we conceded that this is not the most relevant figure. TNR3 §7.2.4 states the "total maximum rail demand is 6,624 one-way trips per day". This equates to 4.0–4.4m trips annually.

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Potential for rail

Potential catchment area

- For rail to be a viable mode, the traveller must *inter alia* be able to make the first and last ‘mile’ connections to railway stations at each end of the journey conveniently and reliably.
- At Cambridge South station, the catchment area is anywhere reachable by:
  - ✓ walking
  - ✓ micromobility (cycle, e-bike, e-scooter)
  - ✓ bus
  - ? private pick-up/drop-off (see next slide)
  - ? taxi (see next slide)
  - ✘ private car (no parking)

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Taxi and private pick-up/drop-off

The question mark for taxi and private pick-up/drop-off stems from Network Rail's forecast and minimal provision, and road capacity constraints.

Table 6.9 AM (08:00-09:00) and PM (17:00-18:00) Peak hour trip generation for each mode

Mode Share	%	AM Peak (08:00-09:00) Trips	PM Peak (17:00-18:00) Trips
Car (Drop off / Pick up)	2%	16	16
Taxi	3%	19	19
Public Transport	11%	76	76
Cycle	24%	175	175
Walk	60%	433	433
All modes	100%	720	720

Transport Assessment (NR-16, Appendix 17.2

9.1.99 Given the above, 3 pick-up/drop off bays and 3 taxi bays will provide sufficient capacity for the predicted level of demand. For this reason, the possibility of vehicles stacking back onto Francis Crick Avenue and impacting upon through traffic is unlikely. The TOC will have responsibility for operation and enforcement in the station forecourt.

NRE2.2

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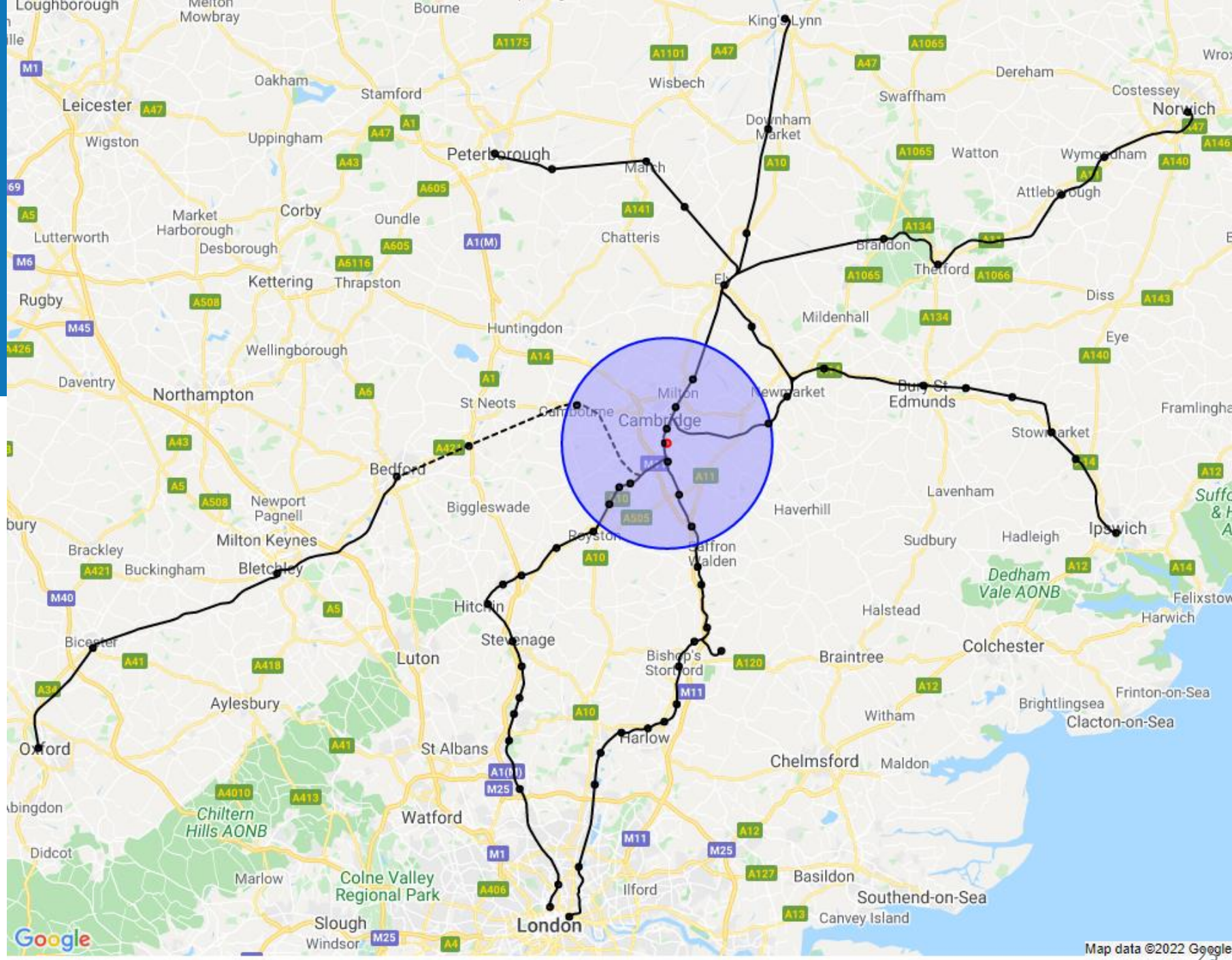
Who is in the wider rail catchment area?

9 stations within 10 miles of Cambridge South (not including Cambridge) plus Cambourne



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Who is in the rail catchment area?

26 stations within 40 minutes of Cambridge

Foxton	Shelford	Cambridge North*	Manea	Dullingham
Shepreth	Whittlesford*	Waterbeach*	March	Newmarket
Meldreth	Great Chesterford	**Ely**		
Royston	Audley End	Littleport		
Ashwell & Morden	Newport			
Baldock*	Elsenham			
Letchworth*	**Stansted Airport**			
Hitchin	Stansted Mountfitchet			
Stevenage*	**Bishops Stortford**			

Bold *= more than 1 million passenger journeys per year*

**Large growth planned*

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Rail–bus integration

National policy on railway stations

Railway stations should be hubs for connecting services with high quality stops close to station entrances.

– Bus Back Better: national bus strategy for England

Railway stations will increasingly be hubs for local bus services, with full information displayed about connecting buses and greater availability of integrated ticketing between rail, light rail and bus services.

– Great British Railways: Williams-Shapps plan for rail

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Appraising better bus integration

4.2.1 Network Rail has not appraised the increased rail patronage and improved user benefits of having bus stops within 20 metres of the station entrance. There is no policy basis for such a suggestion nor does this form part of the project's remit. The location of the bus stops relative to the station is considered acceptable for the reasons described in Mr Hilling's Proof of Evidence (NRE 2.2).

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If it isn't Network Rail's role to assess the optimal location of bus stops, **who will ever do it** for a new railway station?

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Proximity of bus stops

- Bus stops will be between 180m and 290m from the station entrance.
- If they were 20m away, on the busway bridge, that would represent a reduction in interchange time of 2½ to 4 minutes.
- A large component of the benefits of most transport appraisals (e.g. for road junction upgrades and bypasses) derives from journey time savings in this order.
- Reducing connection times not only benefits users already expected to interchange, **it induces more people to interchange**.
- *Benefit* = *TimeSaving* x *NumberOfPeoplePerDay* x *ValueOfTime*, summed and discounted over the appraisal period.

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Conclusion

How robust are Network Rail's assumptions?

3.2.2 Incorporating hard caps on other transport modes implies that all these journeys can and will move to rail. The new station will, in the main, result in transport improvements for passengers travelling over distances of 10 miles and above where rail has a natural advantage over some other transport modes. Local trips, within the Cambridge area, will generally not see a significant improvement as highway travel and active modes will tend to have an advantage over rail. As rail is not projected to cater for a very large proportion of these local trips (for example due to there not being railway stations in all communities), these journeys should not be assumed to transition to rail from other modes upon the opening of the station.

REBUTTAL-NRE-REB-05-Smarter Cambridge Transport (82095777_1).PDF

- If people cannot drive-and-park, and won't/can't choose an alternative, **growth of the CBC is capped**.
- Some people will choose rail because they cannot get a parking place or they find the congestion intolerable.
- Many local trips will be quicker and easier by train than any other mode – even from Cambridge North.

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Key questions

Will the station configuration maximise sustainable travel?

- Is the capacity sufficient to ensure potential rail users can travel in comfort, safety and without undue stress during the expected life of this station?
- Are the bus stop locations optimal for rail–bus and bus–bus trips?
- Will there be enough cycle parking long-term?

In what year will demand exceed the design capacity?

- Will it be within the design life of this station?
- How will the station be expanded when that time comes, and at what cost?

If rail cannot or will not pick up a larger share of travel demand, how is growth of the CBC possible?

- Will the government still be willing to fund the station if it will not ‘unlock’ planned expansion and the resulting economic growth?

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Thank you

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