Churchill and Langford Residents Action Group (CALRAG)

Response to Bristol Airport's Master Plan Consultation
Stage II: Development Proposals and Options, May 2018.

1. CALRAG is a team/committee of some 40+ residents representing 98% of the residents (every house has been leafleted explaining the proposals set out in the Joint Spatial Plan (JSP) and almost all have responded that they identify with CALRAG's aim - to ensure that development is: **Sound, sustainable, sensitive to the environment, makes economic sense and is in the right place**.

2. With the above mandate from the residents, the CALRAG Team, consisting of professionals from a broad demographic including engineering (all relevant branches), surveying, the environment, archaeology, planning, accountancy, law, IT, events organisation and many more who have come forward to offer assistance, we offer the following response.

3. CALRAG attended the presentation to Churchill Parish Council and thank you for the opportunity to comment on the expansion plans for Bristol Airport.

4. **CALRAG believes that this proposal should form part of the West of England Joint Spatial Plan and Joint Transport Study. It should be the subject of the same Public Examination. It is such an integral part of the West of England strategic planning process that it cannot be considered in isolation.**

5. Your Charter for Growth is interesting in that it lacks meaningful detail.

6. Subject to point 4 above, we will respond under the '5 pillars' of your proposals

7. **Pillar 1 'A World Leading Regional Airport'.**

   7.1. It is highly commendable that so many passengers had a good experience and naturally this is good news, but this alone does not provide a good enough reason for passengers to travel further afield to fly from Bristol.
   We would like to see:

   7.1.1. The evidence to support the predicted passenger numbers in the light of the recently proposed expansion of London Heathrow and other regional airports with their own expansion plans.

   7.1.2. Statements such as "Forecasts for growth *suggest* we *could be* serving 15 million passengers a year by the mid-2030s and up to circa twenty million by the mid-2040s) are simply not an adequate reason for such a vast expansion particularly involving green belt land.

   7.1.3. We would like to have details on from where these passengers are likely to come and the transport infrastructure to get them to the airport – this will be addressed under Pillar 4.

   7.2. We feel that the model of 'Predict and Provide' is not one that should be relied upon in

2018 to guide such a huge increase in passengers by 2050. There are many political factors that will undoubtedly influence these numbers.

7.3. CALRAG would like to see far greater emphasis and detail on sustainability and deliverability of the infrastructure required to support such an expansion.

8. Pillar 2 'Employment and Economic Growth'.

8.1. Underlying all the projections of airport expansion is an array of assumptions which you do not describe. Consequently, the economic aspects such as employment, beneficial impact on the local economy remain dependent upon these assumptions. You have not provided a means for us to examine these assumptions and thus gain any confidence in them.

9. **Pillar 3 'At the Heart of an Integrated Network'**.

9.1. We make the following comments:

9.1.1. Clearly, if Bristol International is to maintain and expand its role as a major British Airport, then improved passenger access is crucial – a matter which you, the Airport management, fully appreciate. It is also evident that you need to increase the proportion of your passengers who journey to and from the Airport by public transport.

9.1.2. Furthermore, your own assessment of the geographical origins of your clientele shows that your principal catchment is from the North rather than from the South of the Airport. Access by road from the North is problematic. It would be greatly assisted by a rapid transit passenger route from the Airport to the centre of Bristol. Bristol is a congested hub and car-parking capacity at the Airport is still limited.

9.1.3. It is entirely reasonable that you should promote the idea of a rapid transit rail route to Bristol centre from which country-wide InterCity rail access is then available, as are coaches.

9.1.4. Some passing mention of the above possibility is made within the West of England Joint Transport Study – associated with the West of England Joint Spatial Plan (JSP). This represents a clear reason to include this whole project under the aegis of the West of England Joint Spatial Plan and Transport Study.

9.1.5. The transport implications of the JSP as presently proposed are of serious concern to CALRAG. Our carefully considered view is that the developments proposed for the South of North Somerset are in the words of one senior planning consultant, "*Monumentally flawed*" and it is highly unlikely that they can ever be delivered. In the course of our detailed analysis the conclusion is that the proposed East-West road link between the A38 and the M5 cannot be justified as a significant contribution to the regional or national road network. Moreover, the proposed new junction 21a is seriously flawed because its proximity to the existing J21 requires that it be constructed with south-facing slip-roads only. This disables a principal proposed

function of the new road and the new junction – that of improving access northwards via the M5. Equally, this serious constraint at J21a would substantially reduce its potential benefit as an extra Airport access. This conclusion is supported by Highways England.

9.1.6. The current road transport network is inadequate for three reasons:

9.1.6.1. It is an inefficient way of transporting people and prone to congestion.

9.1.6.2. It generates exceptionally high levels of pollution.

9.1.6.3. If the emphasis continues to be on road transport, the increased passenger numbers which are anticipated in your report will simply exacerbate the problems. We have proposed a twenty first century solution to this 21st century problem - a high performance electrically-driven rapid transit system connecting Weston-super-Mare to Bristol via Clevedon, Nailsea and The Ashton Vale area. For details see *Appendix* (Rapid_Transit3 – pages 4-7).

10. Pillar 4 'A Sustainable Approach'

10.1. Your plans for a 'Sustainable Approach' are short on detail and must include sustainable transport infrastructure – a further reason why these proposals **must** be included within the West of England Joint Spatial Plan and Joint Transport Study and thus be included in the JSP Public Examination procedures.

10.2. The plans are dependent upon highly polluting road use. Electric cars will not solve the problem of countless man hours being lost through inevitable traffic congestion.

10.3. Noise and light pollution will be hard to mitigate and again your plans are short on evidence and detail.

11. Pillar 5 Deliverability

11.1. Until there is a sustainable modern flexible integrated, environmentally acceptable transport system linking the major hub of Bristol and the airport, the deliverability of the proposed scheme must be in doubt.

11.2. Added to this is the very high level of political and economic uncertainty which could undermine your very ambitious objectives.

Written on behalf of CALRAG

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Appendix.
Rapid Transit, Weston-super-Mare to Bristol
Using a novel electromagnetic drive for a public transport system.

1. Why?

Road transport capacity is reaching saturation, especially in and around our towns and cities. And despite improvements in engine efficiency, overall fuel economy is falling as ever more time is spent in traffic hold-ups. Furthermore, thermodynamics also sets an upper limit on the efficiency of heat engines, whilst our concern regarding carbon dioxide emissions and the production of many other pollutants within engine exhaust is, and is likely to remain, an ever-increasing preoccupation.

Meanwhile electric traction, using modern electronic and mechanical engineering, has recently begun to offer major potential improvements in public transport. The linear induction motor, combined with magnetic levitation, allows us to realise a tracked vehicle system with various highly desirable qualities, permitting propulsion, support without wheels, and stable guidance all to be implemented simultaneously to achieve very quiet, and highly energy-efficient transport of large numbers of people on a track with a small footprint (by comparison with a road). Most of the mass of the electric motor is in the track wherein electromagnets supply a rippling magnetic field which Professor Eric Laithwaite vividly and very aptly described as a “magnetic river”. The track width is perhaps 3m or so and can be raised above ground, at ground level, or below ground, as local conditions dictate. It can be very unobtrusive and accommodating of local conditions. Several such magnetically levitated (MAGLEV) public transport systems already exist worldwide.

The use of regenerative braking (particularly important on a suburban stopping route) allows electric energy to be conserved during braking rather than simply dissipated as heat. The linear motor principle coupled with magnetic levitation permits the forces of acceleration or deceleration to be exerted on the passenger vehicles in a widely distributed fashion without the stress concentration associated with conventional railway rolling stock. Amongst many other benefits, this permits very light-weight construction using modern fibre-reinforced materials which reduces greatly the mass which needs to be accelerated. Furthermore, since a (variable) passenger load is now a substantial part of the mass to be accelerated, the energy expended when lightly loaded is substantially reduced. Maintenance costs are also greatly diminished in such a system which has neither mechanical point contact with the track nor any need for conventional wheel bearings.

The use of “high temperature” superconductors, cooled with liquid nitrogen rather than liquid helium, results in major improvements in ease of operation and in achieving the engineering requirements placed upon the relevant magnetic circuits. Modern semiconductor power devices permit the reliable control and switching of the high currents within the track itself.

We should also note that, although most MAGLEV systems in operation at present across the world emphasise maximum speed, very high rates of acceleration are also possible. This must be tempered by practicality – we are not all astronauts or fighter pilots – but even the modest 0.1g adopted below (which is generally regarded as very practical) permits impressively high throughput and short journey times on appropriate commuter routes. I suggest that the route between Weston-super-Mare and Bristol is just such a route.

As a result of recent pressures within the housing market, W-s-M has assumed a major role as a dormitory town for an expanding Bristol. This has had various unfortunate consequences of which a major element is congestion on all the road routes between the two centres. Commuting flows are thousands per day. Improvements in the passenger-carrying capacity of the conventional rail connection are highly constrained and I suggest that the time has come to acknowledge that conventional road and rail connections derived from (sound but archaic) nineteenth century

engineering principles now need to be supplemented, in the twenty-first century, by solutions offered by twenty-first century engineering. Moreover, all the necessary engineering expertise already exists within Britain.

2. A MAGLEV route for passenger traffic between W-s-M and Bristol.

The proposal I envisage here interconnects most of the principal population centres within North Somerset and is based on a single track with double-track passing points at stations along the line. Very high peak operating densities are possible with modern control systems employing computer control of the current steering and switching regimes which operate the driving electromagnets along the track. The actual transit times (limited by a 0.1g ceiling set here for the acceleration) are small (see below) but the waiting plus embarking and disembarking times must be added to this. Certainly, several thousand passenger movements per hour would be achievable with suitable vehicle systems. Moreover, if sufficient land were available, and funding permitted it, a dual track system throughout might be contemplated, thereby increasing throughput and operating flexibility and also dispensing with the need for "points" to permit vehicles to be switched from track to track near stations.

I offer here a suggested route, but detailed planning would be needed to examine this. I suggest that, apart from a route which runs between the two centres via Clevedon and Nailsea, a second spur route, arising around The Vale area SW of Bristol, would permit the realisation of an unobtrusive but very high capacity public passenger transport route to Bristol Airport from the centre of Bristol (with onward public transport links to destinations elsewhere). Improved access to the Airport via public transport is a major preoccupation at present. Relatively steep gradients, as encountered on the airport route, are no problem for a Maglev system.

This proposal (with rather frequent stops) envisages a system, constrained by the need for relatively frequent halts, where the moving vehicles are always either accelerating or decelerating. The journey schematic offered below is, of course, highly provisional. In practice, one would not apply uniform acceleration but would probably blunt both the onset and the offset of the accelerating or decelerating forces. In compensation, one might apply slightly more than 0.1g in the middle of the accelerating and decelerating phases or perhaps restrain acceleration on a long leg to restrict the maximum speed attained. At high speed, air resistance is the principle opposing force, rising as the cube of the speed.

We should recognise that substantial time should be added to the journey for passing, embarking and disembarking. Of particular benefit, however, in any automatic-vehicle control system such as this, is the fact that timing of the service can respond flexibly to high demand.

Two journey profiles are presented here: Weston-super-Mare to Bristol Temple Meads and Bristol Temple Meads to Bristol International Airport. These are depicted below as Figure 1 and Figure 2 respectively.

These profiles break the journey into legs, each of which is defined by a station stop. These stops also provide (on a largely single-track regime) the potential passing places. Also included is a speed versus distance profile (Figure 3) for the longest leg (10km) with and without slight blunting of the transition from acceleration to deceleration. The maximum speed achieved on this longest leg is slightly more than 200mph.

Text Figures:

Figure 1 The journey from Weston-super-Mare to Bristol Temple Meads

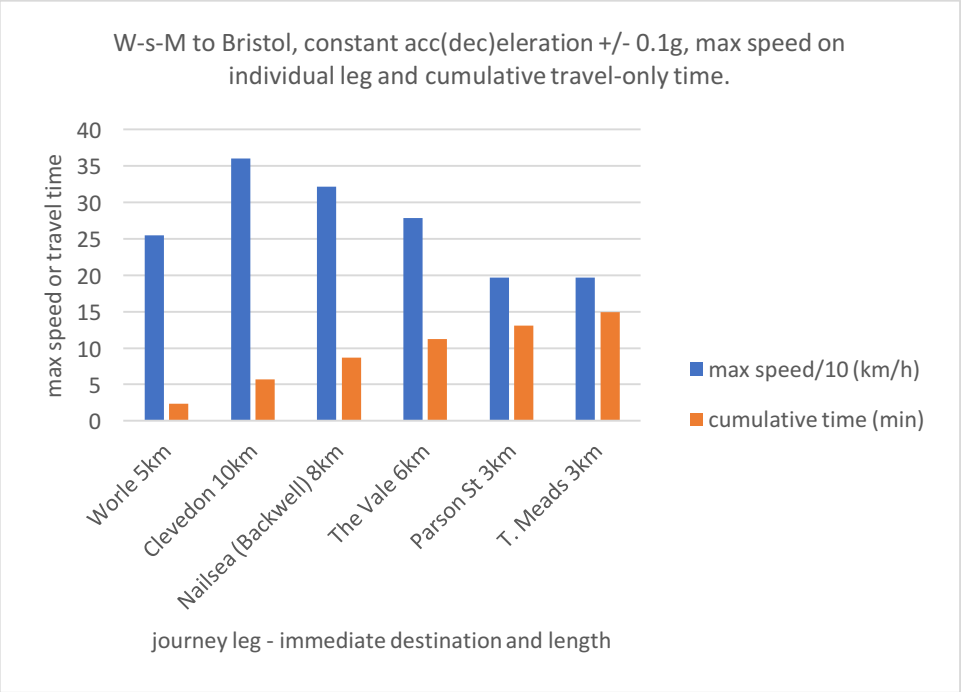


Figure 2 The journey from Bristol Temple Meads to Bristol International Airport

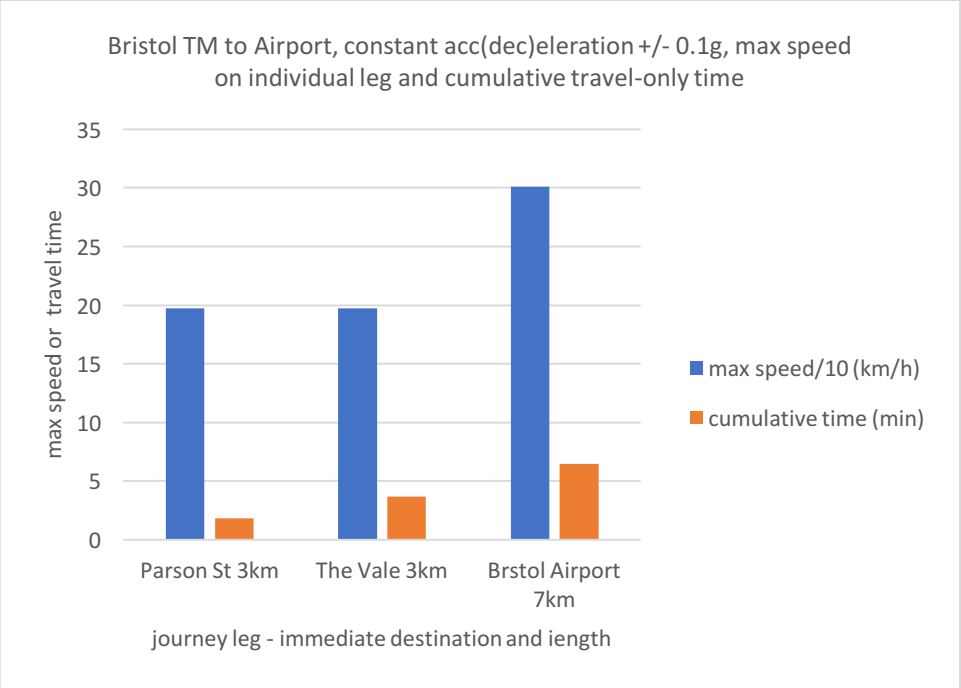
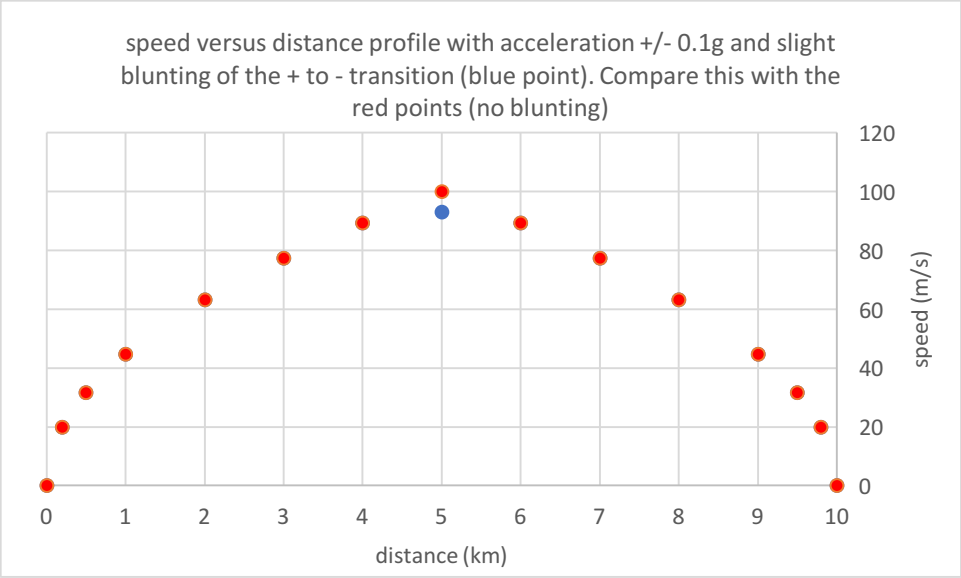


Figure 3 A speed profile along the 10km leg from Worle to Clevedon



3. Implementation

This proposal implies a very large construction project. It would first require a substantial feasibility study and a decision about whether to build in stages. An obvious first stage would be a link from Bristol City (or perhaps from the The Vale) to the Airport. The precise route taken would also require careful planning, but a particular virtue of such a system is its very small footprint and its flexibility: thus it is able to meld rather unobtrusively into the landscape, whilst being able also to negotiate intensively built-up areas either on comparatively lightweight support pylons or in tunnels. Rather steep gradients would pose no particular problem. Costing such a project at this early stage would be an unrealistic effort.

Robin Jeacocke April 2018