

# SWIFT RAIL AND GROWING CITIES



A computer-generated image of a Vivarail D-Train at Stroud in a notional Swift Rail livery.  
Kel Portman

**The UK could learn from Germany and its own experience in London's Docklands when it comes to rail transport links, argue Nicholas Falk and Reg Harman.**

**A** new approach to UK suburban transport modelled on Germany's extensive *Stadtschnellbahnen* and London's Docklands Light Railway system should improve access and connectivity across medium-sized towns and cities and reduce car use. The Swift Rail concept draws on plans to double the rate of house building, improve connectivity, tackle congestion, and promote healthier living – and could be largely funded without adding to the UK Government's financial commitments.

## The infrastructure challenge

Most of the debate surrounding the proposed new High Speed 2 and Crossrail 2 lines has been about making it easier to get in and out of London, with little examination of how to reduce congestion in other cities – particularly medium-sized towns and cities with growth potential. Conventional local rail services are limited and often under-utilised, while proponents of tramways are open to the attack that these are expensive to build and operate. Cheaper alternatives such as guided busways in Cambridge and Luton have not lived up to expectations.<sup>1</sup>

Improving local transport is not just about congestion and safety, but also about overcoming barriers to sustainable or smarter growth. The UK has few large cities compared with, say, Germany, and size helps explain

weaker economic performance, according to a recent OECD report.<sup>2</sup> However, the country does have lots of medium-sized county towns and cities (Oxford, Norwich, Worcester and York) with untapped economic growth potential, as well as historic centres that are growing fast (Colchester and Exeter). Medium-sized cities have lagged behind, as new housing has been concentrated in smaller towns and villages, adding to pressures on roads and local services.<sup>3</sup>

Other nations have taken a more proactive approach to developing local and sub-regional railway lines to support city growth. In the USA there has been a whole movement for Transit Oriented Development (TOD) to focus new housing around rail corridors under the theme of Smart Growth.<sup>4</sup> New tramways (or 'streetcar' systems) have opened to wean people off cars in fast growing cities such as Dallas and Portland (Oregon). In France, continuing development of railways and light rail in suburban areas as part of 'Territorial Coherence Plans' is the norm, as exemplified in ambitious plans for 'Grand Paris'.

With limited public resources for new construction, much greater use should be made of the railway lines that run around the cities with greatest growth potential, especially county towns and those with populations of over 150 000. These are generally located on railway junctions, often with lines around them that are under-used

or closed. What if increased Business Rates (as the UK Treasury has now agreed for cities such as Manchester and Cambridge), along with parking charges, were allocated to supporting transport systems that reduced pressures on over-loaded roads? This could provide an equivalent to the praised *Versement Transports* that underpins so many new French tramlines and metros. It would enable an astute Chancellor to offer cities a real incentive for sustainable and healthier growth, and mark a revival of civic enterprise.

The key is making it the smarter decision by making it quicker and more convenient to use rail-based transport rather than the private car. This requires a new and better form of local/suburban service designed for comfort, rapid acceleration and deceleration, high frequencies, and serving stations at the heart of new developments and existing suburban centres.

Services would be frequent and fast enough to compete with the private car, and should also enable those residents on lower incomes to reach jobs and services, without adding to congestion, using some form of smartcard or smartphone payment. It would thus serve both suburban areas and outlying towns and large villages within the catchment sub-region. We term this Swift Rail Transit (SRT or S-Rail for short), and there are nine key features:

- Routes linking city stations to suburbs and satellite towns within the catchment areas. ➤





▲ A Stadler FLIRT low-floor DMU as delivered to Estonian railway operator Elron. Courtesy of Stadler



▲ A Stadler Tango low-floor LRV on the Rhônexpress service from Lyon to Lyon Satolas Airport passing Decines Grand Large. R. Harman

## "The key to Swift Rail's success lies in an integrated system that is easy to use without a timetable..."

- A main city station to form a hub for co-ordinated local transport.
- All stations located and designed as focal points for their area.
- High standard but simplified signalling on exclusively Swift Rail lines.
- Multiple unit trains with high acceleration and deceleration rates, high-density interiors but with high standards.
- High-frequency services throughout the week, normally 15-minute intervals.
- Integration with local bus and other transport services through links at stations, common ticketing and common promotion.
- Planned and funded by locally-based corporations, linked to development, with participation of bus or rail company and/or local authority.
- Managed by a locally-based company or development corporation.

### Continental models

To test the concept we followed up our proposals for an Oxford Metro, based on lessons from the French city of Grenoble<sup>5</sup>, by assessing what German and other Continental experience can offer a new generation of extended or 'garden cities'. This would give the UK the equivalent of systems such as the ubiquitous German *S-Bahn* (*Stadtschnellbahn*, 'town fast rail') networks which serve major cities but also provide high-density services across smaller city regions. These have often benefited from inspirational municipal leaders who have promoted concepts such as the tram-trains that transformed Karlsruhe and Kassel by making use of former rural railways of the type that have closed in the UK.

German cities have more control over their growth, with regional planning and local finance to ensure that infrastructure and development are co-ordinated, as indeed do most other Continental city regions. Yet they too have had to fight to restore damaged city centres and cope with increasing car ownership. As a result Germany has combined increasing levels of car ownership with falling levels of usage in many places, such as Freiburg. Most people live in flats,

often rented, while wealthier people have moved to detached houses in neighbouring towns and villages. So reviving inner-city neighbourhoods is a general priority.

Traffic-calmed streets are pedestrian and cycle friendly and provide a healthier environment, even while close to the dense centre. As Germans generally defer buying their own homes, those for sale are large and well specified. The resulting savings help to finance first class infrastructure, helped by a system of local savings banks and the state investment development bank KfW.<sup>6</sup> High-rise towers are rare, with four-storey walk-up flats the norm.

Germany has avoided the waste of resources that the UK's outdated housing and planning system has produced. Instead of fruitless competition between different transport operators, city councils control local public transport (tramway, *Stadtbahn* and buses) while state governments ensure there is a good regional service, the *S-Bahn*. This system provides an effective and dense network throughout the core city and catchment region, focused on a central rail station at the heart of the city and its local public transport. *S-Bahn* lines around German cities offer fast, frequent and direct links with the towns in their catchment area without the highly congested roads found round the UK's cities.

The key to Swift Rail's success lies in an integrated system that is easy to use without a timetable across the whole city region. This applies to most German examples, to Swiss cities such as Basel and Zürich, and to some Austrian cities. *S-Bahn* timetables are co-ordinated with trams and buses and operated by easily-accessible low-floor train units, with very fast starting and stopping. The tickets are generally cheaper than in the UK and allow transfers across the local system.

Stations are designed to enable easy transfers between modes, including plenty of cycle parking, often with underpasses that enable entry from either side. A good example is the German North Rhineland trio of Worms, Mainz and Speyer, historic towns that have similarities with conurbations such

as Gloucester and Cheltenham, the Oxford city region, or possibly some of the towns around Cambridge such as Ely.

### Making Swift Rail work

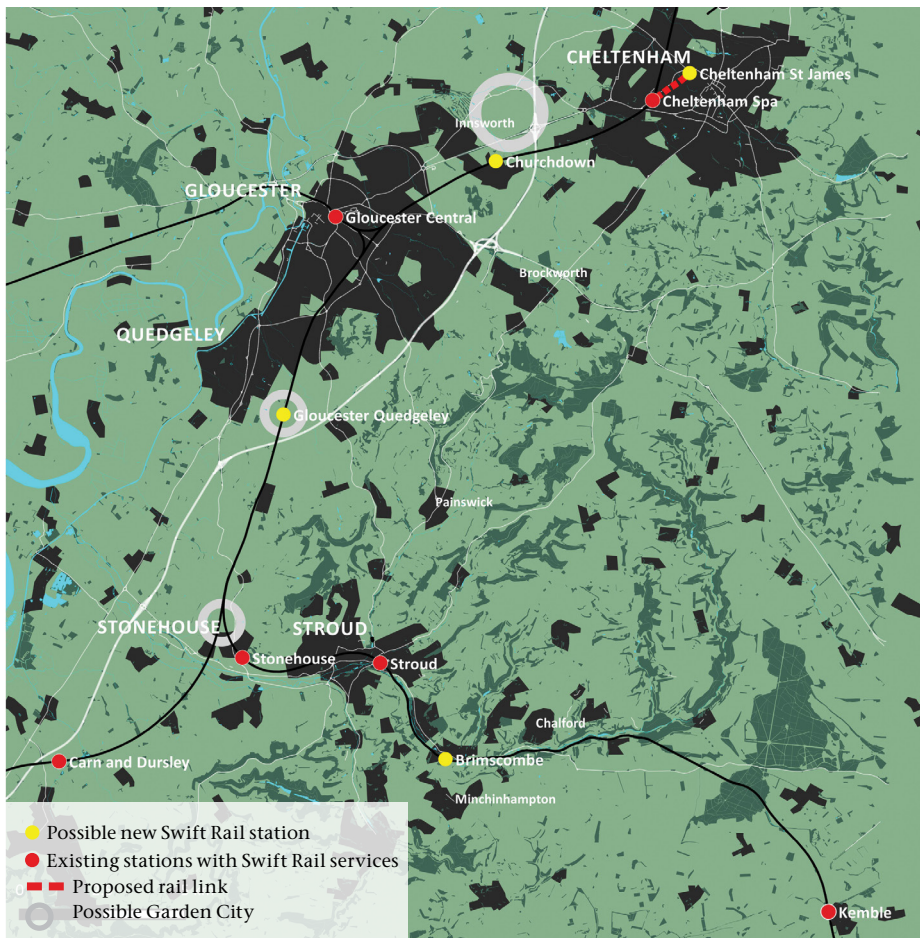
The key to successful innovation is riding on a tide of development, as the DLR did following the creation of the London Docklands Development Corporation, which took over the UK capital's old port and gasworks land. By starting with a short line that used the old viaduct between Tower Bridge and the Isle of Dogs and opened in 1987, the DLR quickly won enough riders to overcome sceptics in the Department of Transport, and was progressively extended to open up other areas for development.<sup>7</sup>

A similar approach could be taken in many fast-growing but smaller city regions that currently lack good public transport but have railway lines running through them. At the same time, there are sites that could well be developed for the kinds of garden city or sustainable urban extension set out in URBED's winning submission for the 2014 Wolfson Economics Essay Prize.<sup>8</sup>

In a 21st Century version of Ebenezer Howard's plans for the Social City, where new settlements are linked to a central city by municipal tramways, the submission shows there is enough value in what Howard called the 'unearned increment' by capturing the uplift in land values to fund quality public transport systems. Today significant funds could be generated from housing and other developments through mechanisms such as the Community Infrastructure Levy (CIL). The benefits of such investment would be properly understood through close co-operation between the bodies involved, joint planning for transport and development projects and assessment of transport schemes against a wide range of objectives rather than on narrow cost-benefit terms.<sup>9</sup>

While the operating economics may limit what can be done, combining upgraded suburban lines with new routes under a Swift Rail system complemented by high-quality bus services and increased use of cycling could achieve radical modal shift. In this way, suburban areas and satellite towns form a vital part of the city conurbation while maintaining their own character.

Also, by operating a high-frequency service along key corridors over short distances,



with stops every few miles, relatively few units and drivers could provide a first-class service opening up new markets for railways. The following concepts set out what this could mean for different conurbations.

### Gloucester

Upgrading railway services in Gloucester has been the subject of a recently-published report for Gloucestershire County Council by Amey.<sup>10</sup> Half-hourly services are being considered but the focus is on getting people to London faster, not meeting local needs. A series of proposals for upgraded or new stations have been evaluated and the results show that a new station could be viable as part of a major extension to the South of Gloucester at Hunts Grove near the new suburbs of Quedgeley. This would enable passengers to switch from the Gloucester – Swindon railway line to the Birmingham – Bristol line as well as attract commuters off the M5 motorway in a similar way to the new GBP22m (EUR31m) station planned for Worcester Parkway.<sup>11</sup>

Proposals for new development both on the rapidly growing southern edge of Gloucester and also on council-owned Staverton Airport, which lies between Cheltenham and Gloucester, could transform the situation. Bristol Metronet, which has examined the potential in the former Avon County area, would like to extend to Gloucester, and a switch to greater rail use could greatly ease the bottleneck around the M4/M5/M32 intersection near Bristol Parkway station. Such a growth plan would be far more sustainable than some current

proposals to build new housing near motorway junctions. A few large extensions should also please those living in the many small villages in the surrounding countryside who fear that green views will be nibbled away, such as in the hills around Stroud and the Golden Valley.

A Swift Rail service to growing employment centres such as Swindon could complement the planned fast trains, especially now the railway from Kemble has been returned to double-track. Surely it must be common sense to look at transport and development plans together, and locate new housing where the infrastructure is best able to cope?

### Colchester

The old Roman and now university town of Colchester has experienced much faster growth than other cities in Essex (24% in 1991-2008, or twice the average for the East of England). It has also been assessed as one of the UK's most car-dependent cities by the Campaign for Better Transport.<sup>12</sup>

Consideration is being given to whether the town should be the location for a new garden city, and proposals have been put forward for a major development at Marks Tey. But there is an under-used railway branch line to Clacton, which is already double-track and electrified, as well as a short spur into the town itself. A local group has developed proposals to show how developing along the railway – which could serve not just the depressed coastal area but also the fast-growing University of Essex – could produce more sustainable development than

a location that would increase congestion on the overloaded roads west of Colchester.

### Cambridge

Cambridge is an attractive city in its own right but its essential role now is as a major employment centre in a range of research and other advanced functions. It is also a centre for retail, leisure and other services. Consequently the nominally country areas around it act as a scattered suburban region, mostly focused around small towns, but with substantial new settlements already in existence or being built. The West Anglia rail routes plus the railway to Newmarket provide for some travel along their corridors but large parts of the catchment only have bus links. Four park-and-ride sites, served by high-frequency buses to the centre, provide city access and reduce pressure on central roads but do little to reduce the dense traffic levels across the catchment region.

People living in the catchment region generally lack easy access across it, especially in the town of Haverhill, the largest in the UK to no longer have a railway station. Proposals from local groups already include the possibility of reopening the Haverhill line and even conversion of the controversial Cambridgeshire Guided Busway back to rail. There is now agreement to reinstate the old railway line to Wisbech, which could be another growth point.

### Oxford

Upgrading of local services through Oxford, including the reopened branch to Cowley, forms part of the Oxford Metro network proposed by the authors. This competes with Oxfordshire County Council's ideas for building new tunnels under the city centre to take new bus rapid transit routes, but could well secure support from main line operator Chiltern Railways once the problem of how to upgrade Oxford station to handle increased services and provide better facilities has been resolved.<sup>13</sup>

### Other potential areas

Development of the equipment and techniques might also be applied to various other existing or closed railway alignments around the UK. Examples include rural services across Norfolk, focused on Norwich; the Cardiff Valleys network, due for electrification anyway; the creation of a Swift Rail network around Nottingham, Derby and Leicester from surviving local lines and some of the network of closed alignments; and possible new services closer to London, such as between Staines and Uxbridge.

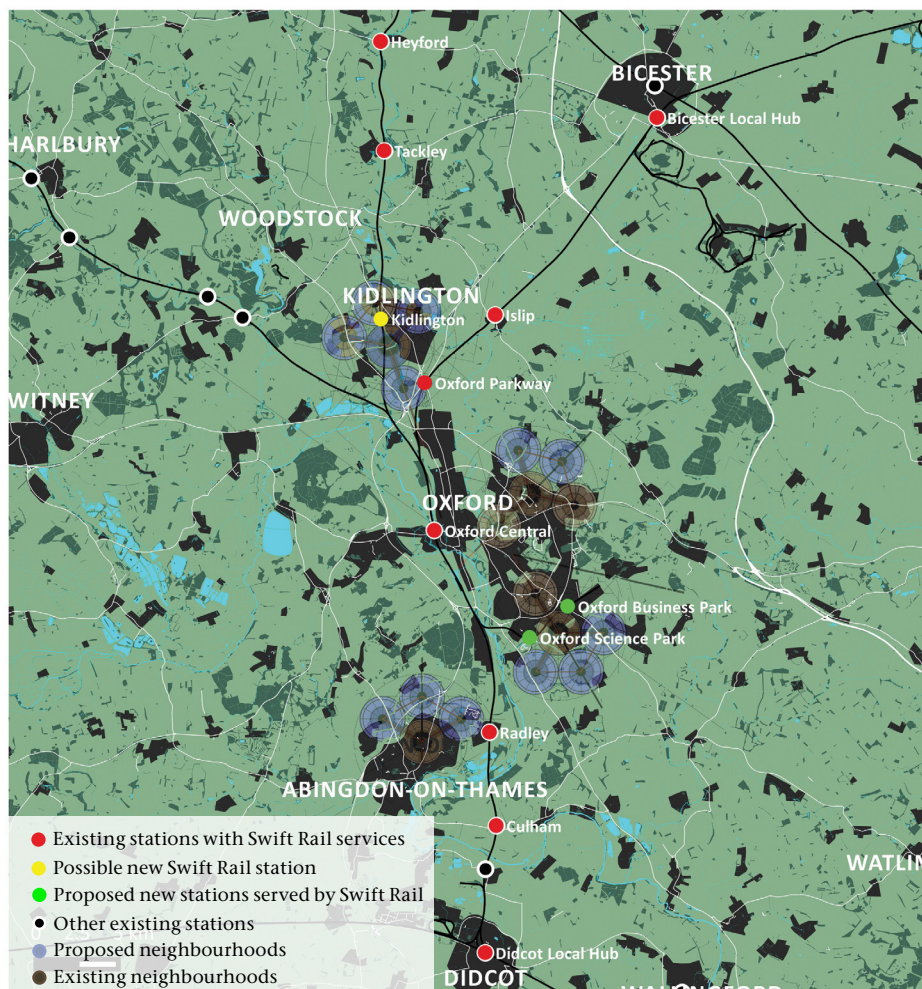
No doubt full assessments would throw up other opportunities, including some that are already subject to proposals by local interests.

### Issues and opportunities

Swift Rail has a great deal to offer a 21st Century nation seeking to combine mobility and strong economic activity with sustainability and good quality living. The high quality of places and movement across central Europe and Scandinavia secured by this approach demonstrate this.

Nonetheless the UK regimes for regional planning and railway development are very different. In particular, the administrative





regime is strongly centralised, with national government directly controlling almost all railway development through economic regulation, direction of Network Rail and the passenger franchising system, as well as technical regulation and guidance on aspects such as train design and signalling systems. There is effectively no regional planning, and spatial planning for local areas is firmly guided by government rules and direction.

As a consequence it is difficult to innovate, especially where this involves a new approach across several disciplines. The Swift Rail concept would require close and continuing co-operation between two or more local authorities, developers and funding organisations, land owners and business interests, and especially various levels of railway providers. These would be Network Rail in regard to infrastructure provision and management, an operating company, rolling stock manufacturers and perhaps signalling and civil engineering companies. It would also need strong management and co-ordination over the development period from within the city region.

In principle the Local Economic Partnerships (LEPs) might be the best focus for this, but in practice the ability of LEPs to act in this way is questionable. This suggests that a specific company might need to be incorporated to develop, build and possibly franchise or run the service. Such a company might be established as part of a development corporation that could link the provision of better transport services to the supply and servicing of land (as with the London

Docklands Development Corporation).

Four aspects may need to be addressed:

- Existing Network Rail lines are operated almost entirely with conventional 'heavy rail' trains, which offer neither the performance nor the image for Swift Rail. However initiatives are underway, such as the promising Vivarail *D-Train* concept, which uses converted former London Underground stock, and Swiss rolling stock provider Stadler is considering the British market. Tram-type low-floor rail vehicles, such as the Alstom *Dualis* or Stadler *Tango*, are also possible.
- Although they may run on their own lines for part of their journey, Swift Rail trains will almost certainly operate on the existing Network Rail system, especially through junctions and main stations in the city regions. While this affects the design of trains, it also requires the track layout, design and signalling to meet the needs of Swift Rail. Network Rail and government regulators will have to agree and implement appropriate standards (perhaps as part of a wider upgrade).
- Investment projects affecting Network Rail lines and stations would also need to be subject to development and appraisal under the Governance for Railway Investment Projects (GRIP) procedure. If a Swift Rail line were usable for freight and other rail operations (as many German tram-train and Swiss multi-purpose lines are), there may be gains in terms of greater support for industry without extra pressure on roads. A major financial contribution could come from

higher density commercial development around an upgraded station (as, for example, at London Paddington or Reading).

- Operation of a Swift Rail line or network as part of a city region system to meet local access and travel needs can best be done by a local company. Leaving it to a distantly-based Train Operating Company would remove the focus on local aims and markets. There are three possible models: one is to pass franchising responsibility to the city region, on the same basis as Merseyrail in Merseyside. The second would be to include it as a micro-franchise (such as the Island Line on the Isle of Wight) within the main franchise. The third would be for the development corporation to franchise the service, or to run it before handing it over to an operating company.

## Conclusions

Most thinking people would agree that development and infrastructure need to be considered together, and that we must find ways of reducing car usage.

Our proposals for Swift Rail are radically different to the usual UK 'top down' and adversarial models, but could appeal to a government looking for ways to provide better services without increasing public expenditure, and for using new housing to create healthier lifestyles. They might also win support from a transport industry that is increasingly linked to European operators, and from cities that want to improve quality of life without it 'costing the earth'.

With all the concerns about managing costs, it would surely pay to examine the role Swift Rail could play in urban expansion plans and the economic benefits that could result from joining up infrastructure investment and strategic development. **TAUT**

› The authors wish to offer their thanks to contributors to their initial work, particularly Mike Draffin, Graham Garbutt and Peter Headicar. All maps courtesy of Vicky Payne.

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