

What to do about the roads

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1. Introduction

This brief paper sets out an economic, financial and regulatory framework for addressing road network investment and maintenance in Britain, based broadly on the utility model, independent regulation and a regulated asset base.

Most analysis of roads policy starts with the status quo and considers incremental reforms. This has proved to be a mistake. The correct way to design policy is to start the other way around: to consider the economic characteristics of road provision, and then to design the financing and regulation around them. Ownership follows from this financing and regulation framework.

2. The economic nature of the problem

A number of rather obvious—but frequently neglected—features of roads have important economic implications.

- i. **Roads are long lived**—indeed they are best regarded as *assets in perpetuity*. Provision needs to be made for the existing network and to enhance and expand it, practically forever. There is therefore *no role for depreciation*, and the appropriate way of accounting for roads is by *current cost accounts (CCA)*, with a *provision for capital maintenance* (physical rather than financial) to maintain the value of the assets intact. There then needs to be a revenue flow sufficient to reward capital maintenance of the

existing assets and capital enhancement plus its subsequent capital maintenance.

- ii. Roads form part of a system**, in which every individual road depends for its value and use on its interconnection to all the other roads. Change one bit of the system and it potentially has effects on all the other bits. The larger the road in volume of traffic terms, the greater the impact. Critical nodes have special system impacts. The implication is that the value and potential revenue from user charges of any road depends upon the other parts, and therefore the economic value of new roads is the sum of the system effects. Disaggregated provision is likely to be sub-optimal. Conventional stand-alone cost benefit analysis of particular projects will not capture these system characteristics.
- iii. The road system has considerable natural monopoly** characteristics with only limited constraints from competition from other transport modes. Particular roads may face competition from other roads, but not the road system as a whole. Particular roads also face competition from rail and aviation, notably for urban networks and for inter-city travel. The implication is that the demand for roads *as a whole* is likely to be inelastic, whilst that of a particular road may be elastic. A tolled road is more exposed to the risk of revenue loss than a charge for road use in general – for example, through a license fee or fuel duty. The system however, because demand is inelastic, should be able to finance itself – it does not *as a whole* need public subsidy.
- iv. The potential for time inconsistency arises because, once a road is built, the marginal costs are typically way below the average costs.** It is economic to operate the road at marginal cost once the road is built, even if it does not cover the average costs. This in turn means that the investor needs some guarantee that the regulator will not promise *ex ante* to provide for the recovery of the capital costs, and then *ex poste* renege

and force prices to marginal costs—and hence be time inconsistent. The implication is that private provision requires long-term credible contracts.

- v. **Externalities** from road use are numerous and include emissions, noise, accidents and environmental damage from loss of habitat, isolating species and loss of landscape amenity. Water drainage also needs to be included. Benefits include social inclusion and network externalities with other transport networks. These positive and negative externalities are still poorly researched, particularly at the land use and systems levels. They also vary considerably by location. There are also impacts on economic growth more generally, since the costs of transport form part of the broader cost structures of every company and every household, and are embedded in goods and services.

3. Financing

There are two related financing issues: financing for new roads, and financing of maintenance for existing roads.

Irrespective of ownership, financing of new roads requires a commitment to a revenue stream which will remunerate the (equity) risk in construction, provide a permanent return to the sunk capital costs, and provide for maintenance expenditure (and the associated policing, accident and emergency and other support services like gritting and snow clearance). This can either come from road users in one form or another, or taxpayers (or some combination of the two). Choosing the latter does not avoid the issue – it is generic.

As noted above, since the demand for use of the road system as a whole is inelastic, there is no reason why roads as a whole will need a taxpayer contribution. A taxpayer contribution is a matter of choice, not economic necessity, and it depends upon the efficiency characteristics of providing the service. This turns out to be far from

straightforward. In an efficient tax regime, there is a case for taxing inelastically demanded goods, and hence there is a case for a net surplus to the Exchequer.

The monopoly economic characteristic has a second consequence: there needs to be regulation to avoid the abuse of its monopoly power. This can either be internalized through the state ownership or by an independent organisation. Again the point is generic. The position of individual roads within it may be quite different: for example the M6 toll road may not be able to recover its costs, faced with the parallel existing and untolled M6. Indeed, even if both were tolled, the combined costs may not be recovered given that the average costs are much higher than the marginal costs – unless explicitly provided for in regulation.

Considering the system as a whole, there are two broad ways in which the roads can be financed. Here for the moment assume it is CAPEX.

These are:

- The *status quo*—Pay-as-you-go
- The *utility model*—Ring-fenced

4. Pay-as-you-go

This is the way roads have been financed for at least the last century. The government decides how much road infrastructure to provide, and finances it out of tax revenues on a cash basis.

There are a number of reasons related to the underlying economic characteristics identified above as to why this model has endured for so long. The first is the fact that roads have important monopoly elements, and in particular it is hard to envisage competing road networks except in cases such as the M6 toll road.

The second is the time inconsistency problem and the inability of government to commit to private investors that they will be remunerated, such as to recover their average rather than marginal costs. This is coupled with the fact that most road provision has been provided free at the point of use, and subject to fixed fees like the vehicle licence, rather than by tolling. By publically providing the funding, the government commits to itself rather than to private investors that the costs will be recovered – in the pay-as-you-go approach by taxpayers. In other words, the pay-as-you-go approach is the consequence of a political failure to credibly commit to private investors.

The third reason is a related one. The cost of capital to government is typically lower. This however disguises two costs: the equity risk in the roads is transferred to taxpayers; and the credibility requirement is avoided. In other words, the perceived lower cost of capital is “smoke and mirrors” and the evidence from privatized utilities, as discussed below, suggests that this opaqueness may actually raise the costs of public pay-as-you-go financing.

Pay-as-you-go has other serious drawbacks. At its heart is the idea that current customers will pay for benefits which accrues to future customers – on the grounds that they in turn benefitted from previous generations. There is therefore no separation between asset creation and current spending. This cash-based approach, in turn, is constrained by general government finances, which tend to be short term and trade offs are made politically between competing projects across a range of public expenditure. The result has been anything but optimal, as road programmes are subject to short term stop-start decisions according to the business cycle and the periodic crises in public finances – such as the present one.

Furthermore, because the decisions on new roads and network expansion lie with government, the pressure to “do nothing” is immense. The combination of pressure groups to prevent expansions and the interests of the Treasury to hold back spending have had the result of fossilizing the existing network.

5. The utility model

The alternative is to take roads out of the government budget altogether, and to create a *ring fenced road systems entity – a utility*. (We leave aside for the moment whether this would be public, private or mutualised).

The roads utility would comprise a licenced entity, owning all the road network (or a part of the network such as strategic roads and motorways). It would have the duty to maintain the existing network and to invest in the creation of new assets. Being a monopoly, it would be subject to regulation – for example along the lines of water companies. It would share with Network Rail the features of being a network infrastructure company: Network Rail does not own or operate the trains and the roads utility would not own or operate cars and lorries.

The financial structure of the roads utility would comprise:

- A regulated asset base (RAB)
- A CAPEX programme
- An OPEX programme

The regulated asset base would be some approximation to the CCA value of the road assets. The complication here is that the existing assets have already been paid for by taxpayers and road users (through taxes and vehicle licences), and hence it could be argued that the assets themselves should not be further remunerated, with only the capital maintenance costs being covered. *The opening RAB would therefore be zero.* This might be called the “minimal RAB” approach. Alternatively, by selling the assets to the private sector, the existing value is returned to shareholders. This might be called the “maximal RAB” approach with a large initial RAB value.

As new assets are created, the RAB would “buy” the completed new assets and hence there would be a positive RAB value as the network was enhanced over time. These

competed projects in the RAB would need to earn a return, and since their valuation would be on a CCA basis, this would be in perpetuity.

The return on RAB assets would be protected through a duty to ensure that the utility could finance its functions, and hence once the new assets were completed they would attract only a debt cost that would be close to that on government bonds.

The revenue flows for maintenance of existing assets would not go away, nor would the CAPEX costs and the RAB returns. This mirrors the existing position: they are all paid for now. The difference in the ring fenced RAB case is that the numbers would be whatever is necessary to fulfill the functions, not whatever is the bare minimum that can for a period of time keep the network going, by putting off enhancements and allowing a backlog of maintenance to pile up.

6. The regulatory functions

A roads utility would need to be regulated, and there is now considerable experience of how to do this. The periodic review framework, supported by licences and special administrator functions provides a template to carry over to roads.

What matters considerably is who would do the regulating, and specifically how the regulation of roads would relate to that of rail and aviation. The early example of the serious locational mistakes in investment in the electricity and gas industries as a result of separate regulation through OFFER and OFGAS, using different accounting rules, points towards a *single transport regulatory body*, which would be forced to consider consistency in approach.

There is therefore a strong case for a roads utility to be regulated by a new *Office of Transport Regulation (OTR)*, incorporating the Office of the Rail Regulator (ORR), (and possibly the economic regulatory functions of the CAA too). This would have the added advantage of reducing costs too.

It would not be the job of the regulator to decide the optimal road network. These policy decisions would remain with government. The Department for Transport (DfT) would be responsible for such decisions, as is DECC for major energy network upgrades and DEFRA for water quality requirements.

This would require the disbanding of the Highways Agency, and a focus on the core policy decisions within DfT.

It would remain to consider how the ancillary road services such, as policing and accident and emergencies and so on would be carried out. To an important extent these are secondary decisions, and they could remain very much as at present, though the cost could be more transparently applied to the road utility.

7. The ownership options

The choice of model—pay-as-you-go or the ring-fenced utility—is strictly separate from the choice of ownership model. Many private utilities have been subject to a form of rate of return regulation that is in effect pay-as-you-go, and publically owned utilities and various forms of mutuals are ring-fenced utilities. It is therefore not necessary to privatize the road system to change the basis of finance.

The case for an ownership change arises on two grounds – economic efficiency and private finance for new projects.

The efficiency argument for private ownership arises from the structure of incentives, and in particular the possibility of excess returns for abnormal efficiency. There is also a separate argument that public ownership tends to lead to government failure as decisions are bent towards political expediency and the interests of politically important interest groups. These arguments are well known and have been debated for three decades in respect of utilities and infrastructure in the UK.

The case for private finance is often confused with the efficiency argument above. It is claimed that although the cost of capital will be higher for private finance over government funding, this will be more than compensated for by the incentives to deliver CAPEX on time and to budget. It is further argued that when a whole of life contract is let, the private investor will have an incentive to design the project to minimize the subsequent maintenance costs.

Experience of two decades of the PFI and with the PPP for the London Underground has not provided convincing evidence to support these claims. On the contrary, many of the PFI cases have been specifically designed to meet accounting rules with respect to government expenditure, rather than for efficiency reasons. In this regard, governments have become the prisoners of cash-based accounting, and the absence of a public balance sheet setting out assets and liabilities has seriously skewed decision-making.

8. Practical implementation of the utility model

By separating out the issue of finance, regulation and ownership, roads can be reformed in a sequential fashion, leaving the contentious ownership question to last.

There are several key steps to implementing the utility model:

1. The separating out of the assets for inclusion in the new entity
2. The creation of a licence
3. The creation of the Office of Transport Regulation

These steps can be taken whilst the roads provision continues as at present: the revenue flow is simply transferred to the new entity.

The next step is to hypothecate road user payments to the new entity. This involves:

- The road licence charges are paid to the new entity

The new entity will need a balance sheet. This involves a decision on existing assets and a choice of opening valuation.

- The balance sheet can begin with the CCA value of the existing roads; or zero (on the assumption that existing assets are already paid for and therefore remain owned by taxpayers)

With the utility created, licenced and with an opening balance sheet, the next step is to consider the finance of capital maintenance and new CAPEX:

- The capital maintenance is currently financed by a mix of the licence fee and public provision. This remains in place, but is paid now to the new entity, subject to the OTR adjudication on the required revenues to finance this function for the initial period – say 5 years
- The CAPEX is financed by borrowing by the new entity. Whilst this can be remunerated as now (by public finances) there are now other options, all requiring a future revenue stream.

So far the change to the utility model has not required a change in the pay-as-you-go financing, but rather has changed the institutions through which this flows and the creation of an arms length regulatory body to determine how much money is needed to carry out the functions.

The next step is to consider the move away from pay-as-you-go. This requires a decision about the future ways of charging for the roads, and this in turn determines whether and to what extent the utility balance sheet can be used.

None of the above requires the privatization of the utility and hence the roads. This is a further, distinct step, and could be taken in some years time. In the meantime, a publically owned company could be created to hold the utility licence.

9. Conclusions and recommendations

It can be concluded that:

- i. The current arrangements are unlikely to produce an optimal road network or provide adequately for its maintenance
- ii. There is no reason why the roads as a system should not be able to be self financing – taxpayer contributions are not necessary
- iii. Short term cash based expenditure is seriously distorting and leads to under provision
- iv. Reforming the roads can be undertaken in a series of steps, without the need to embrace full-scale privatisation.

It is recommended that:

- i. A roads utility is created
- ii. A new Office of Transport Regulation is created, to incorporate the current ORR and possibly the economic regulator function of the CAA
- iii. A RAB –based licence regime is established for the new roads regime
- iv. The vehicle licencing fees are hypothecated to the roads utility
- v. A periodic review framework is established, with the DfT defining the policy framework
- vi. New revenue streams – such as tolling – are introduced in a gradual way
- vii. New roads CAPEX is financed against a RAB balance sheet, with a variety of options for the project finance element.

The gradual introduction of the RAB-base utility model provides a long-term solution to the problem of road investment, maintenance and finance, creating a pathway towards a stable regime, with flexibility over timing and ownership and charging mechanisms. This could be done in stages, creating the utility and its regulatory framework in the next 2-3 years, whilst dealing with the expanding options for revenue over time, as public confidence grows in the ring fencing from government, and as technology and experience grow from tolling experiments.