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Date	14 October 2009		
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Project	C2C Franchise - Business Case for Cycle Investment	Project No.	22213301

Subject **Approach and Preliminary Analysis**

Introduction

Steer Davies Gleave has been commissioned to examine the market potential for cycling on the C2C franchise route, and to develop a business case justification for the inclusion of cycle parking provision and complementary measures to inform the forthcoming franchise specification.

This work will be objective-led, guided by the Government's stated aim to increase the volume and share of cycle usage to access the rail network. Increasing cycle usage offers the potential to deliver significant benefits in terms of increasing rail patronage, reducing congestion and emissions and delivering health benefits (including direct health benefits, and productivity gains to businesses in the form of reduced absenteeism). These benefits align closely with the Government's overall objectives for transport as set out in DaSTS.

The study is at an early stage, but initial surveys and scoping has been undertaken and is presented below, along with a description of the proposed methodology for the overall study.

Forecasting and Scheme Development

The forecasting of potential cycle demand (including suppressed demand), in conjunction with an overview of existing provision, will form the basis for identifying where new cycle facilities should be considered, and the scale of that provision. This will essentially be identified at a station by station level, through assessing where current provision is insufficient to meet current or potential demand. The potential provision of cycle facilities will also need to consider forecast rail growth along the corridor over the franchise period, to ensure there is capacity to cater for growth.

Having identified, on a station by station basis, which stations should be considered for cycle improvements, a more detailed site visit would be undertaken to identify the feasibility of implementing additional facilities. This would consider the scale and location of potential cycle parking measures to inform an outline scheme definition, but would not be a detailed design exercise.

The methodology for forecasting unmet demand for cycling parking at stations is set out in detail below.

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Scheme Appraisal

The scheme appraisal will build on recent research[1] into the investment case for cycle facilities. The key inputs into the appraisal would be:

- Scheme costs. These will be developed on a unit-rate based approach, informed by recent cost estimates. We would also consider the potential for economies of scale for the delivery of cycle parking improvements at a Franchise level.
- Scheme demand and benefits – A forecast of additional cycle trips would be made, and this would form the basis for the estimation of benefits to existing cycle users, new cycle users (e.g. health benefits), and wider societal benefits, such as reduce carbon emissions, congestion, accidents and absenteeism.
- Financial Impacts – An assessment would also be made of the financial impacts of the proposal, particularly in terms of ongoing costs and revenue implications at the TOC level. This would consider both additional revenue from new 'cycle-access' rail users but also any revenue loss to TOCs though reduced car parking revenues.

The scheme appraisal would then take these inputs and forecast, using standard webTAG and DfT Rail economic guidance, the economic performance of the scheme as a whole, and of the performance of each station. Examination of the performance of individual stations will enable the appraisal be used as an analytical tool to help refine and optimise the definition of the scheme.

Sensitivity and scenario testing will be undertaken and reported to both understand the key individual areas of uncertainty, and their impact on the case, and through this to also assess the robustness of the overall case.

Identifying Complementary Initiatives

The Cycle Parking at Stations and Station Travel Planning work suggests that, where improved cycle provision at stations has been implemented, there is often little or no associated marketing and awareness activity targeted at potential (rather than current) customers. This, by definition, limits the scale of potential additional users to those who will already use the station, and ignores a sizeable potential market (typically those within 1-4 km of a station) of those who might be willing to cycle if the opportunity was better advertised. As part of our work we will therefore identify (and cost) the range of complementary measures that we believe would enhance the overall value delivered by the business case.

Overview of Preliminary Analysis

Initial analysis of the data collected for the c2c franchise stations indicates possible early candidates for locations where improved cycle parking facilities may help realise currently unmet demand. Data has been collected about current provision and utilisation of both cycle parking and car parking and a first cut analysis has been conducted to determine the catchments of each of the stations and the populations within them. These data and analysis are presented in the map and table attached.

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[1] Investment in Cycle Facilities at Rail Stations – Developing a Business Case Framework, Report for C.R.I.T. July 2009

The table shows car parking provision categorised on the basis of utilisation and current spare capacity. This is presented as Red-Amber-Green score on the basis of the car park currently operating at capacity (Red) or near capacity (Amber) indicating locations where demand for rail travel may be or could in future become constrained.

Similar analysis of cycle parking availability shows where current parking provision is more than 80% utilised (Red). This being the level at which observations from cycle parking surveys suggest that people begin to perceive that there is no capacity available. This is particularly the case for large arrays of Sheffield stands or 'toast rack' stands, where any spaces on innermost stands are hard to reach, but will vary according to the number and layout of individual stands. A further indicator – categorised Amber – is the observation of unofficial cycle parking even when there is capacity in the designated cycle parking area. This suggests that some users find the existing provision inadequate for whatever reason – e.g. proximity, security or perceived capacity – and are behaving as though, and presenting a message to potential users that, there is insufficient provision.

The table of this analysis shows that several car parks for the outer stations are operating at or near capacity and at three of the stations in this section of the line cycle parking is also at capacity. This would suggest that Benfleet and Chalkwell particularly but also Stanford-le-Hope, Laindon and Southend East are all locations where improved provision might have a positive impact on revenue. Whereas there may be an economic case for further investment at Pitsea though this may be at the cost of loss of revenue from car parking.

The next stage of analysis will be to improve the definition of the catchments areas for the stations to take account of the levels of service at each and to analyse the geo-demographic data to forecast trip rates for the potential cycle catchment accordingly. This will improve the robustness of this initial analysis and enable an estimation of the size of the potential extra demand for cycle access rail trips.

Forecasting Unmet Demand for Cycling Parking at Stations

Overview

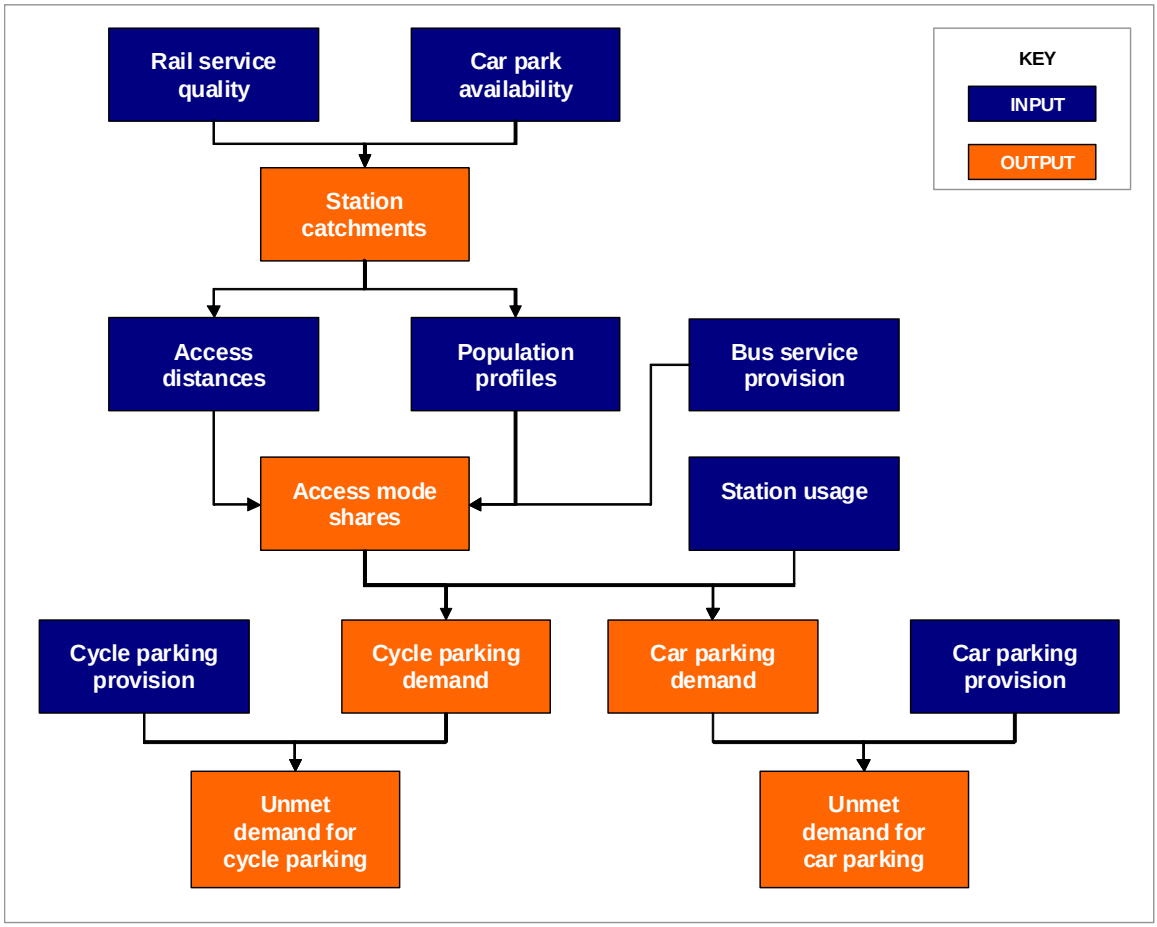
This section describes the methodology used to forecast the unmet demand for cycle parking facilities at C2C stations. That is, the additional amount of cycle parking needed to satisfy the latent demand which is currently not being satisfied.

The method involves estimating the cycle & park access mode share that would be achieved if sufficient, good quality, cycle parking is provided. Some of the key parameters for this are derived from the earlier Cycle Parking at Stations project which included obtaining actual cycle parking usage data collected at stations with spare capacity.

An important intermediate step in estimating access mode share is to establish station catchment areas, which is done using our Station Catchment Modelling Tool which allocates everyone in the population to the station they are most likely to use. The model can be run with and without constraints on car and cycle parking availability in order to test the impact of these constraints.

A visual overview of the process is provided below, highlighting the various key inputs into the process and the various intermediate and final outputs.

OVERVIEW OF CYCLE PARKING DEMAND ESTIMATION METHOD



Principal factors for this analysis

The key factors influencing access mode share are:

- Distribution of distances which station users live from the station (access distance)
- Population profile
- Availability of car parking
- Rail service quality
- Bus services availability

Each of these are described briefly below.

Access distance

There is a strong relationship between how far someone lives from the station and how they get to the station. This means that if the local population are concentrated near to the station and therefore within an easy walk, the walk access mode share will be higher than if station users tend to be coming from further away. In terms of cycling, the core distance is 1-4km and a key driver for assessing the cycle mode share is therefore the proportion of station users who are expected to come from this distance band (see also the note on station access decay).

Population profile

Some types of people are more likely to use rail than others, and some are more likely to cycle. It is therefore important to take into account whether people living 1-4km from the station are the sort of people who are likely to travel by rail and to cycle. This is done by using our TravelStyle geodemographic classification system which classifies the population into six segments according to their travel behaviour, including likelihood of travelling by rail and likelihood of being a cyclist.

Availability of car parking

If there is no or insufficient car parking at the station this will clearly affect the access mode share, limiting the park & ride demand.

In addition, lack of car parking can potentially affect the use of the station with insufficient car parking leading to 'suppressed demand' where people chose not to make a trip by rail at all.

For those choosing still to travel by rail, the effect of a lack of car parking can be to force customers to drive to a station which is further away, but does have parking available (rail-heading).

Rail service quality

This effect (driving to a further away station or rail-heading) can also be seen if one station has a noticeably better rail service than adjacent stations. This will affect access mode shares because the station which has the more attractive service will attract drivers away from nearby stations with a less attractive service (even if they have car parking available).

Bus services availability

Bus can be an attractive access mode for trips of around 4-10km in length where good services are provided. The availability of bus services to get rail travellers to the station can be taken into account when estimating access mode shares.

Cycle parking demand

The predicted access mode shares are then applied to the known volume of rail trips to forecast the demand for cycle (and car) parking facilities. These are compared with the actual provision to derive an estimate of the unmet demand.

Suppressed demand

If the modelling shows a shortage of car parking and this is backed up by observed car park usage (i.e. full car parks) we can then look to estimate suppressed demand: that is the extent to which current passenger volumes may be under-stating the potential demand. This is done using a trip-rate modelling approach where trip rates, adjusted for the characteristics of the local population and the access distance profiles, are compared against those for other comparable stations. By applying the trip rate derived from comparable stations to the station with suppressed demand the unconstrained (or expected) demand can be estimated. The difference between the actual and expected demand is the volume of suppressed demand.

The importance of this to cycle parking is the effect on the business case. If new cycle parking is provided which encourages some passengers to switch from car to cycle there is a loss of car parking revenue. However, if there is suppressed demand for car parking then this releases some car parking spaces for use by new customers so increasing the fare-box revenue as well as maintaining the car parking revenue.

Key concepts

Station catchment
The area from which the bulk of a station's users are drawn. We have developed GIS software which models catchments which can take into account the road network, rail service quality, car parking availability and relative cost.

Suppressed demand
Potential trips which are not made because of a perception that the station is difficult to get to or it will be difficult to park. Includes trips which are made by car instead, or, in the case of optional leisure trips, which are not made at all.

TravelStyle segmentation
A geodemographic classification system based on MOSAIC plus added travel behaviour data, including use of rail. It classifies every Postcode in the UK into one of six segments each with its own propensity to use rail, to park & ride, to cycle & ride and to travel by bus.

Trip rate
Rail trips divided by the population. Usually expressed as the average rail trips per person per year.

Access distance decay
People who live close to a rail station tend to travel by rail more than those that live further away and this effect is summarised in an "access distance decay function". This function is non-linear in that the trip rate falls much faster at short distances (such as between 1k and 3km) than at longer distances (such as 5km to 6km). This reflects the fact that having to walk more than 10 minutes, or use another motorised mode to get to the station is a significant barrier to making a rail trip.

Generalised Journey Time (GJT)
This is the means by which the quality of rail services at a station are described on a common footing. It takes into account not only the rail travel time itself, but also the service frequency and need to interchange. This is done by means of headway and interchange penalties which convert these into rail travel time equivalents.