

Executive Summary



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Study Overview

The Plymouth Eastern Corridor Study was commissioned by Plymouth City Council, to consider the range of public transport options to serve the corridor, which is to see significant residential development in the forthcoming decade. This Final Report presents the results of both the Phase One and Phase Two work and is the final deliverable of the study. Phase One included the assessment of public transport options, the outline operating and capital costs and the potential role of demand management measures. A recommended package of measures has been identified to conclude this work, providing inputs to Phase Two in which potential funding opportunities have been considered in more detail.

The eastern corridor has a number of key developments proposed for completion by 2016, the assessment year of this study. These include the Sherford New Community (4000 residential units by 2016), Plymstock Quarry (1500 residential units) and regeneration to the west of the Laira Bridge. To enable an assessment of travel demand and transport options to be completed, assumptions have been made regarding trip generation rates, distribution and internal development designs; where possible existing master plans have been used in association with information provided by developer consortia. It has not been the objective of this study to assess or determine appropriate highway designs or access arrangements to developments. The main objective of this study was to assess a hierarchy of public transport services, including:

- Conventional bus priority;
- Segregated bus routes along the A379 and an alternative route to the north of Plymstock Quarry;
- Bus Rapid Transit; and
- Light Rapid Transit.

A corridor-based Paramics model and separate variable demand model have been used to assess the potential demand for, and impacts of, each transport option. The process has included the application of variable demand techniques, leading to the identification of the percentage of trips being suppressed (i.e. being re-timed or not undertaken) from all key origin locations. A multi-modal assessment has been undertaken, consisting of changes in car journey times, bus use and journey times and the requirements for interchanges and Park and Ride.

Recommended Package of Measures

The recommended package of public transport measures centres on a Bus Rapid Transit (BRT) service, from the Deep Lane junction of the A38 into the city centre. The route would operate from a Park and Ride site at Deep Lane, through Sherford New Community, along the disused railway line adjacent to the A379, rejoining the A379 prior to Laira Bridge and running on carriageway into the city centre. The proposed route would include the following bus stops and interchanges:

- Deep Lane Park and Ride, operating as a bus interchange for the north of the Sherford development and as a park and ride for traffic on the A38. The modelling assessment has identified a demand 320 vehicles in the AM peak period (07:00 – 10:00) in 2016. Using a 1:3 peak hour to all day ratio of demand derived from existing Park and Ride sites, an overall site capacity of 1000 spaces is recommended. Advice received from Plymouth City Council following the completion of this study, and relating to potential developments in the north of the city, have identified that the capacity at Deep Lane could be doubled post 2016 to accommodate other demand;
- Sherford North (primary school)
- Sherford Central;
- Sherford South (secondary school);
- Plymstock Quarry,

- Exeter Street and City centre.

No other interchanges or Park and Ride facilities in the Eastern corridor are recommended at this time, based on forecast traffic flows and potential public transport demand. The potential A379 Park and Ride at Elburton is not recommended at this time, as forecast traffic flows do not indicate that sufficient demand would be generated. A Park and Ride at Plymstock Quarry is also not recommended, as it is situated too close to the network constraint of Laira Bridge and would not generate benefits in terms of traffic reduction in this already constrained area.

The BRT service would operate at a frequency of 12 buses an hour and a forecast journey time of 14.8 minutes between Deep Lane and the city centre, requiring a bus fleet of 11 vehicles. The annual operating costs would be £1,344,000, with annual revenue generated of £1,426,000, resulting in a revenue surplus of £82,000. This revenue is generated from an assessment of the AM peak demand, scaled to 12 hours. This would represent a modal split of 47% for trips between Sherford and the city centre. However, some trips from the Sherford development would be suppressed, as a result of the congestion on the network in 2016, and the resulting longer journey times by car to key destinations. The application of variable demand techniques has been critical in this study, and involved an iterative process between the Paramics network model and the spreadsheet based mode choice model. Such an approach provides the most robust assessment of future travel choices, reflecting changes in congested and freer flowing networks.

The benefits of operating a segregated bus route along the disused rail line section between Haye Road and Plymstock Quarry, and therefore benefiting by avoiding congested network links, include:

- Enhanced journey times;
- Better reliability; and
- Enhanced safety.

There are also benefits of operating a BRT rather than conventional bus services, including:

- Reduced dwell times (through off-board ticketing);
- More efficient vehicle performance (acceleration and braking); and
- Higher quality vehicles.

These will all promote the services as a step change in public transport provision, and raise the profile and perception of services. A requirement of this brief was the consideration of the potential for LRT, as a long term option. However, the Stage One option assessment work identified LRT as not being cost-effective, and such a mode could not be recommended based on forecast demand levels.

The route along the disused rail line should be designed to incorporate tie-in points with the A379, providing routing alternatives should any constraint appear on the segregated route, such as a broken down vehicle. This would also permit existing services using the A379 to feed into the segregated route at a number of points, affording journey time benefits for all services.

There remain outstanding issues regarding the condition of the disused rail line at selected points that could not be accessed, and other potential uses of the route. Further investigation would be required during the preliminary and detailed design stages, and it is recommended that Plymouth CC commence liaison with appropriate land owners. A short term option of the BRT joining the A379 at the junction with Colesdown Hill has also been discussed, and this could be considered as a lower cost option. The precise routing is again dependent on the final materplan of the Plymstock Quarry site.

An important consideration has been the operational characteristics of the service at each stage of the route, to maximise the running speeds. In Sherford it is important to ensure that the service can move as quickly as possible through the development, unimpeded by highway traffic, and possibly through the use of virtual segregation. It is not recommended that buses operate on-carriageway unless appropriate and significant bus priority measures are incorporated. The results of this work highlight the need to ensure that bus services operating through Sherford can achieve a journey time commensurate with a step change in provision, and this must be taken forward by the developers within ongoing master planning activities. The required journey time or average speed to be achieved through the development should be agreed with Plymouth CC to ensure that appropriate infrastructure investment is safeguarded.

This will require pump priming funding or significant contributions from the developers. However, it is realised that a staged implementation may be necessary. In the short-term, enhancements to the public transport network include the establishment of a direct Plympton to Derriford bus service routed via Deep Lane Park and Ride to accommodate travel demand from Sherford, and the routing of the Plymstock–Plympton–city centre service through the Sherford development site. It is recommended that Deep Lane Park and Ride and the segregated bus route to the city centre are implemented in year one of the proposed developments, to ensure that a step change in service provision is achieved. It is also recommended to introduce bus lanes and priority measures along the A379, using the available highway capacity. The forecasts have identified potential increases in existing Plymstock bus service journey times as a result of increased traffic flows and congestion in 2016. Although many of the bus services operate along relatively short sections of the A379, bus lanes and priority at key junctions are recommended. Such options should be introduced in the short term and are inexpensive relative to the segregated route.

The recommended package has been subject to an economic assessment; two funding scenarios have been assessed, with varying levels of do minimum developer input. The Benefit to Cost Ratio (BCR) for an entirely publicly funded scheme is 1.4 while if some measures are assumed to be funded as part of the do minimum development measures the benefit to cost ratio increases to 2.5.

Supporting Policies

The City of Plymouth possesses a number of attributes that would strongly support a TIF bid, which are further promoted by the proposed regeneration of the city centre and the associated economic and productivity benefits. There is also a strong preference within DfT guidance for large-scale schemes, and the city-wide enhancement of public transport services in Plymouth would meet such criteria. The eastern corridor should therefore be viewed as being the first corridor enhancement in the city, rather than in isolation.

A more immediate funding mechanism while a TIF bid is developed would therefore be through a major scheme bid, and it is strongly recommended that Plymouth City Council begin liaison and discussions with the DfT on this matter.

- A potential need to reduce the overall level of travel demand by car into the city centre;
- The need to promote a shift to sustainable public transport modes;
- The need to promote social inclusion within the local transport network; and
- The need to enhance accessibility to the local network.

It is also recommended that the old rail bridge be converted for use by cyclists and pedestrians, thus reducing conflict between modes on Laira Bridge. The creation of a community link would form part of the overall package of enhancements for non-motorised modes, which would include crossings in association with Plymstock Quarry, Sherford and in the vicinity of bus stops and interchanges. This work should tie in with the proposed introduction of cycle routes between Langanage and Elburton (through the Sherford development) and along or adjacent to the A379. One option for the latter was the disused rail line. However, this existing route is considered to be a more cost effective asset as a public transport corridor. Negotiations with the Sherford developers should therefore also include the need for a new cycle route between Elburton and Laira Bridge, and should involve Sustrans as a key stakeholder. Any new cycle route has not been included within the costs of the options considered within this study.