

## TRANSPORT FOR LONDON

### TfL BOARD PAPER

**SUBJECT: West London Tram Project (WLT)**

**MEETING DATE: 29 April 2004**

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#### 1. PURPOSE

Following a series of intermediate mode studies and project feasibility work, the Mayor decided in May 2002 that the West London Tram scheme should progress to the next stage of development. The TfL Board noted the project status in March 2003. Since that time significant progress has been made in developing the project. The purpose of this paper is to set out the strategic case for the tram, report on progress, provide an update on the business case and describe broadly the proposals for public consultation in the summer.

The project will go through further detailed refinement and development over the next nine months particularly as preparation is made for a Transport and Works Order Application. The information contained in this paper is current and reflects the work undertaken to date.

#### 2. THE STRATEGIC CASE FOR WLT

##### 2.1 Introduction

Following a number of planning studies into intermediate mode options for Outer London 1996, London Transport published a report titled *New Ideas for Public Transport in Outer London*. From original investigations of 45 areas and 9 case studies, a transit proposal from Uxbridge through to Shepherd's Bush was in the final four proposals recommended for further development. In May 2002, the Mayor gave the go-ahead to develop proposals for the West London Tram Scheme from Uxbridge to Shepherds Bush.

This paper aims to demonstrate that the tram proposal is the best means of addressing the long-term transport needs of the corridor. This includes the need:

- to meet the expected demand for extra public transport capacity in the most cost-effective manner;
- to provide enhanced quality and reliability of public transport services on the corridor;
- to achieve optimum modal shift from private to public transport; and
- to reduce social exclusion and aid economic regeneration.

TfL has developed a strategic framework for evaluating the role for light transit in key corridors in London. The framework involves using seven evaluation criteria: capacity, reliability, modal efficiency, mode share, regeneration, deliverability and value for money. These criteria are addressed in turn in this paper to demonstrate the role for the WLT project.

## 2.2 The need to provide more capacity

London is the fastest growing city in Europe, facing an expected increase in its population of 800,000 by 2016. The West London sub-region is a high growth sector expected to accommodate around 45,000 additional homes and 86,000 new jobs by 2016 to cater for the projected 140,000-population increase in West London. This corresponds to a growth rate of 10% and 11% for population and jobs respectively. In the areas of Southall and Hayes, over 35,000 new jobs are expected with nearly 6000 new homes, many centred on the Southall Gasworks site.

Uxbridge Road connects several town centres and areas of very dense population in West London such as Shepherds Bush, Acton, Ealing, Hanwell, Southall and Uxbridge (see Annex I). It has been a key public transport corridor for over 100 years, and was previously served by a tramway between 1901 and 1938, after which trolley buses were provided until the early 1960's.

Buses dominate public transport in the West London corridor, as heavy rail and LUL lines do not run parallel to the Uxbridge Road. There is no parallel rail corridor that can act as an alternative to WLT for the majority of journeys in the corridor.

Along the Uxbridge Road there are connections to central London by rail and tube from Uxbridge, Southall, Ealing and Shepherd's Bush via separate lines but none providing attractive journey options along the corridor.

Recent census information (see Table 1 – National Statistics Office) shows that between 1991 and 2001 there has been a significant increase in population and car ownership along the corridor. Car ownership in the three affected Boroughs exceeded the outer London average of 7.1%. Employment also increased by 58,000 jobs during this period.

**Table 1 – Changes in west London between 1991 and 2001 Census**

| Area                   | Resident Population (000s) |       |         | Car Ownership (000s) |      |         | People in Employment |
|------------------------|----------------------------|-------|---------|----------------------|------|---------|----------------------|
|                        | 1991                       | 2001  | %change | 1991                 | 2001 | %change | 1991-2001            |
| London                 | 6,678                      | 7,172 | 7.4%    | 2225                 | 2616 | 17.2%   | +606,066             |
| Hillingdon             | 232                        | 243   | 4.8%    | 101                  | 117  | 15.6%   | +19,967              |
| Ealing                 | 279                        | 301   | 8.0     | 93                   | 113  | 21.9%   | +26,207              |
| Hammersmith and Fulham | 148                        | 165   | 11.8%   | 42                   | 49   | 15.1%   | +11,504              |

Source: — National Statistics Office

The result of the WLT modelling to date, predicts that both car ownership and public transport demands will continue to rise steeply in the corridor. For example, between 2001 and 2016, the number of public transport trips with destinations in West London in the morning peak is predicted to grow by 38%. Total travel to Central London from the WLT corridor is expected to grow by 17%.

Highway traffic levels generally across West London are predicted to increase by 15% by 2016. However, detailed traffic modelling shows that many roads around the Uxbridge Road are likely to experience higher growth than this – many over 30%. Very little new road capacity is planned during this time. The magnitude of the travel growth and the high levels of car ownership demand a step-change increase in public transport capacity over the next 10 years. Traffic modelling has demonstrated that at certain junctions, the current road network is already over capacity and a good case exists to address these in advance of the tram.

Continued improvements to bus services are essential in the short to medium term to meet this growth. The local bus network consists of the 207 bus route running between Uxbridge and Shepherds Bush as a split service, with the 607 express service running the length of the corridor and other bus services joining and leaving the Uxbridge Road at various points.

Bus patronage on the 207 and 607 is estimated to grow from 23 million to 27 million/year between 2003 and 2011. Together with the remaining bus routes using the Uxbridge Road, patronage in 2011 could exceed 35 million compared with around 30 million today.

In peak periods, the current bus demand in the corridor is around 2,000 passengers per hour. This is predicted to rise to around 3,000 passengers per hour by 2011 in a no tram scenario. Annex II shows that the introduction of bendy-buses would allow this demand to be met. However, analysis to date indicates this is the practical and economic limit to what buses can effectively deliver.

The level of demand shown in Annex II will build up after the tram is opened in 2011 through a combination of growth in jobs and population, mode shift and latent demand. Public transport demand in the peak hour for a tram service would be around 5,500 passengers/hour at St Leonard's Road, Ealing. Patronage is further explained in Section 3.4.

Some additional capacity is planned on other modes including:

- Improvements to the capacity and journey times of the District and Central LUL lines under the PPP; and the
- Development of Crossrail and likely improvements in local rail services such as more trains per hour from Southall station.

The enhancement of LUL services and the possible introduction of Crossrail could well increase the demand for public transport services to rail/LUL interchanges, particularly at Ealing Broadway. From the Route Map contained in Annex I it can be seen that the existing demand for public transport in the wider corridor is served by:

- Piccadilly Line – Uxbridge towards Central London – interfaces with Uxbridge Road at Ealing Common. Also serves South Ealing.
- Metropolitan Line – Uxbridge to Central London via Harrow, Wembley and Baker Street – addresses demand north of Uxbridge Road.
- District Line – Ealing Broadway and Ealing Common to Central London via Acton and Hammersmith.
- Central Line – Ealing Broadway to Central London via North Acton and Shepherds Bush.
- Great Western Main Line towards Paddington – serves Hayes, Southall, Ealing and Acton.
- North London Line – Acton Central towards Richmond and North Woolwich.

A 40m tram has a capacity of 300, which is more than double the capacity of a bendy-bus at 120. A tram facility along the Uxbridge Road can provide the capacity to move the projected

initial patronage of 44m. The design proposals intend to ensure that a further 20 million passengers per year could be accommodated to support growth well beyond the projections in the London Plan.

### 2.3 The need for better reliability

The reliability of road-based public transport is a fundamental constraint to the quality of service. Uxbridge Road has nearly 300 side or feeder roads with three main intersections with the TfL road network. Road capacity in the corridor is severely constrained. In recent years some road space has been re-allocated to public transport through the London Bus Priority Network (LBPN) and London Bus Initiative (LBI). Additional bus lanes have been introduced and priority given at many junctions.

Route 207 is a flagship route and part of the London Bus Priority Network. The route covers 74 stops and takes approximately 101 minutes to cover the full 20km of Uxbridge Road. Route 607 covers the whole of the Uxbridge Road in just over 60 minutes and stops 20 times.

With the introduction of the priority measures under the first phase of LBI (LBI1), investment in bus priority along the route has protected the bus from the general decline in speed. However, LBI1 has not improved net journey time and reliability. Furthermore, average bus speed on the Uxbridge Road is projected to reduce from 13kph (8.1mph) on the 207 to 11kph (6.8mph) in 2011 - resulting in an end to end journey time of approximately 117 minutes.

Without a step change in reliability and on-going protection of the existing reliability, passenger benefits from further increases in bus capacity will be offset by declining journey time and rising operating costs.

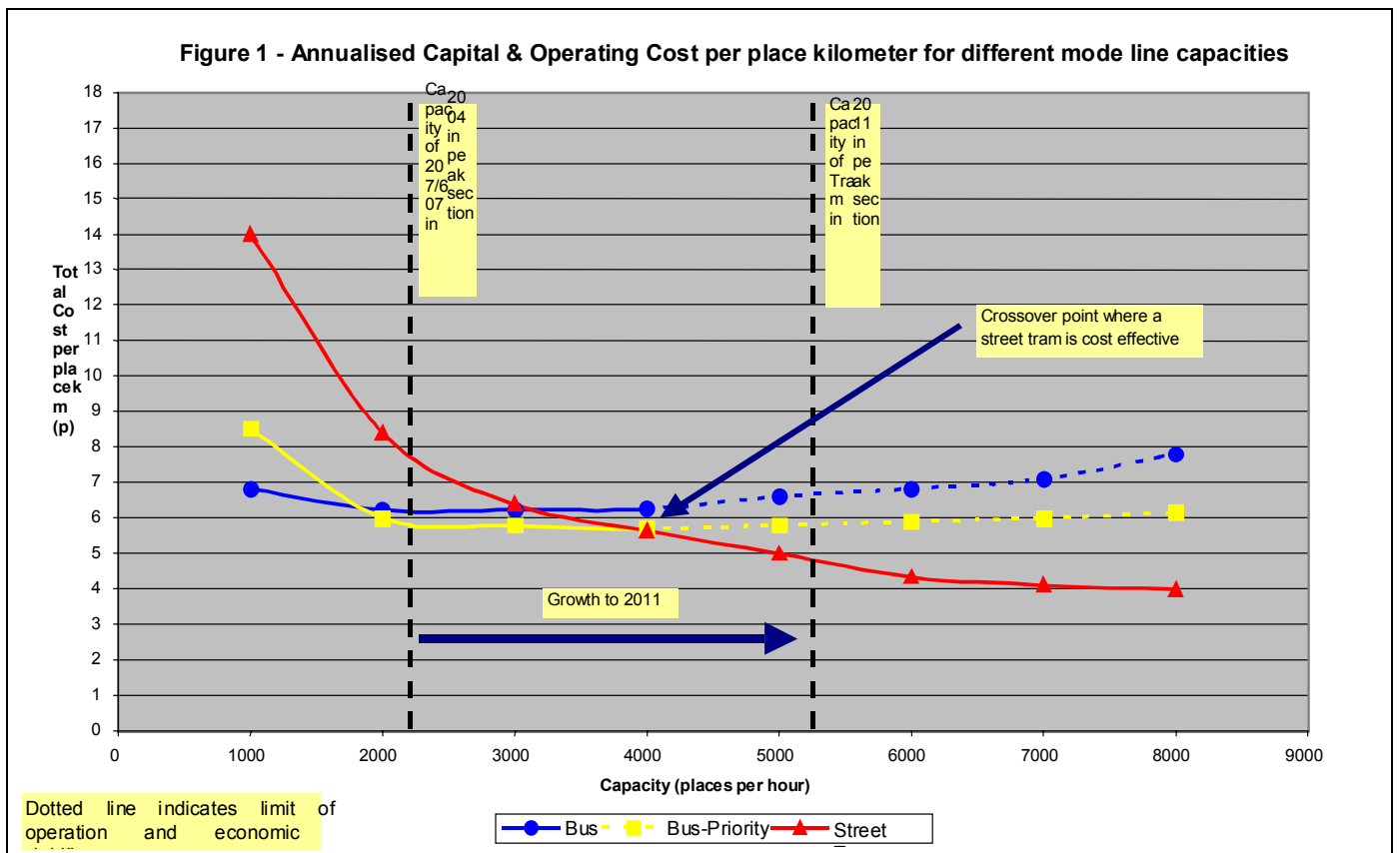
The tram proposal offers a number of key reliability advantages:

- **Junction capacity.** As passenger numbers increase and the buses provide more capacity less priority can be given at junctions. With fewer trams carrying greater numbers, priority for the tram will ensure more people move through the junction. The tram will therefore be more reliable. Other roads and bus routes could also benefit, as fewer trams would need priority. Some junctions such as the Lido Junction at Northfields Avenue cannot be given maximum priority now as the junction is already over capacity.
- **Boarding & Alighting Times.** Whilst new bus design can improve boarding and alighting times, trams are designed with more doors that are wider thus reducing boarding and alighting times. Trams also improve accessibility to the mobility impaired (motorised buggies made over 20,000 trips on Croydon Tramlink last year).
- **Acceptability of greater priority.** The community, business and borough councils have indicated that they are more willing to re-allocate road space and give this higher level of priority and segregation to a fixed track facility. Croydon Tramlink consistently exceeds its 98% target for kilometres operated and achieves below the 4.5% long gap target. These performance measurements represent one of the most reliable forms of public transport in London.
- **Continuous Priority.** LBI experience shows that for priority to be most effective it must be over the whole route or large parts of it and properly enforced. Currently less than 8 kilometres or 40% of the Uxbridge Road has dedicated bus lanes. The current WLT design proposes segregated running for over 70% of the route. This level of segregation ensures a higher level of reliability, particularly with enforcement.

## **2.4 The need to use the most efficient mode for the task**

The third key issue is the need to minimise operating costs and subsidy required for public transport. The efficiency of different modes varies according to the capacity provided and the degree of segregation. Figure 1 shows the relationship between cost and capacity for bus, bus priority and tram modes. It has been derived using actual costs from systems in the UK and Europe.

Figure 1 - Annualised Capital & Operating Cost per place kilometer for different mode line capacities



Source: TfL TPP Major Projects: Light Transit (this Figure is indicative only)

The cost profile for each mode takes into account both the annual operating and maintenance costs, and the annualised capital and renewal costs. At capacity levels below 3,000-3,500 bus is generally the lowest cost mode. Beyond 4,000 passengers/hour, tram is the lowest cost mode.

Buses are limited by their relatively small unit size – one driver can transport about 120 passengers. In the case of tram, one driver can take about 300 passengers. The productivity of each mode is also a function of operating speed and reliability.

Figure 1 shows indicatively that in the case of the tram, at high passenger volumes, cost per place kilometre reduces.

There will be increasing pressure on costs and subsidy for bus services in the London including the western corridor due to:

- real increases in tender prices (frequent vehicle renewal i.e. buses require to be replaced and refurbished more than trams);
- impact of increasing congestion on reliability and operational efficiency; and
- the difficulty of achieving higher levels of bus priority.

Table 2 below compares the current 207/607 bus characteristics with the proposed tram solution in the busiest section of the West London tram corridor in morning peak eastbound in 2011.

**Table 2 – Comparison of 207/607 (2003) with WLT (2011)**

| Mode | Journey Time (mins) | Stops | Capacity | Operating Cost per passenger km (pence) | Waiting Time (mins) |               | Excess Waiting Time |           |
|------|---------------------|-------|----------|---|---------------------|---------------|---------------------|-----------|
|      |                     |       |          |   | Scheduled (SWT)     | Average (AWT) | Mins                | AWT / SWT |
| 207  | 101                 | 74    | 1682     | 12.2                                    | 2.8                 | 4.34          | 1.5                 | 1.5       |
| 607  | 60                  | 20    | 510      | 12.3                                    | 4.9                 | 6.2           | 1.3                 | 1.27      |
| Tram | 65                  | 40    | 5120     | 7.3                                     | 2.0                 | 2.5           | 0.5                 | 1.25      |

Source: WLT Project Team

Table 2 shows that the tram can deliver:

- 40% saving in operating costs per passenger km;
- 35% improvement in journey time (compared to the 207) – this will increase to around 45% by 2011 given the predicted decline in traffic speed and congestion;
- 20% improvement in reliability (compared to the 207) – this will further improve to around 35% by 2011; and
- a doubling of capacity in the peak section in 2011.

## **2.5 The need to reduce car use and traffic growth**

The level of car ownership in the area together with increasing employment, shopping and leisure opportunities dispersed across the area has caused increasing traffic congestion, declining reliability of public transport services and longer journey times for all users of the corridor.

The average vehicle speed in London is projected to decline by 15% between 2003 and 2011 from 20kph to 17kph. Many parts of the Uxbridge Road are forecast to experience traffic volume growth between 10% and 30% by 2011. A similar situation is also predicted on key roads in the corridor with some showing a 30% increase in traffic volume.

An attractive public transport service together with effective traffic management is needed to generate a higher mode shift from cars in the corridor. Trams have a proven track record in generating high mode shift. Modelling shows that WLT will shift between 4-8 million trips from cars. The scale of this mode shift is consistent with evidence from Croydon Tramlink.

## **2.6 The need to support regeneration**

The first four criteria in sections 2.2 to 2.5 describe the underlying transport and economic case for the tram. While these four represent the primary objectives, the tram can also have benefits for economic development, social inclusion and the environment.

The London Plan identifies particular employment opportunity areas within the western corridor at Hayes, West Drayton and Southall, which all would have improved accessibility if the tram was built. The predicted new homes and jobs in key areas in the corridor are shown in Table 3.



**Table 3 - Opportunity Areas within the WLT Corridor to 2016**

| <b>Opportunity Area</b>       | <b>Area (ha)</b> | <b>New Jobs</b> | <b>New Homes</b> |
|-------------------------------|------------------|-----------------|------------------|
| Hayes, West Drayton, Southall | 371              | 35,000          | 5,800            |
| White City                    | 30               | 11,000          | 1,200            |

Source: London Plan

Significant pockets of deprivation exist within the tram corridor, including Hayes, Southall, Hanwell, West Ealing, Acton and Shepherd's Bush. For example, the Dormers Wells ward in Southall is ranked in the top 8% of deprived wards nationally, and a further 10 wards along the alignment are in the top 20% deprived wards with a combined population of 120,000 (see Annex III).

Key development areas along the route include White City, Acton town centre, Ealing town centre, Hanwell, Southall (particularly the 70 hectare ex-Gasworks site), and Hayes. This is one of the largest brown field sites in West London. Throughout the corridor there is a plethora of smaller designated development areas including Acton, Ealing and West Ealing town centres.

Fixed light rail infrastructure systems across Europe and the UK have demonstrated that they can considerably add to regeneration through improved access to employment opportunities, education and retail locations coupled with inward investment from employers and businesses.

The London Borough of Ealing Unitary Development Plan (UDP) defines certain areas within the borough as community regeneration areas warranting priority in terms of investment. One of Ealing's key aims to achieve this is to upgrade transport corridors where established areas of economic activity are in need of regeneration and renewal to sustain their vital role and improve their economic competitiveness. Southall, Acton, Park Royal and Greenford Green are key nodal points where regeneration is planned.

A tram would have an impact in supporting regeneration because it would help meet the public transport demand and provide a greater degree of certainty for investors. The higher levels of accessibility and service quality should also attract new users.

### **Summary of objectives**

The tram is considered to be the best mode for the longer term (i.e. post 2011) in this particular corridor to address the five needs described above. It will:

- produce the capacity to support growth
- deliver a highly segregated, reliable service
- reduce operating costs per passenger
- offer a highly attractive service to compete with car travel and generate high mode shift; and
- encourage necessary environmental improvements and regeneration.

These five objectives cover five of the seven criteria in TfL's evaluation framework. The other two – deliverability and value for money - will be covered in the following sections of this paper.

### **3. PROJECT DESCRIPTION**

#### **3.1 Design & services**

The project design has been developed over the last 18 months and includes a 22 kilometre on-street tram facility that links Shepherd's Bush to Uxbridge with 40 stops approximately 500m apart (Croydon Tramlink's stops are in excess of 600m apart). The proposed tram is 40 metres in length and with a capacity of 300 can deliver an initial annual capacity of 44 million passengers with the capability to be increased to over 60 million to meet future demands.

The overall speed of the tram is 19kph with a proposed service pattern of 10 trams per hour between Uxbridge and Hayes (Ossie Garvin roundabout) increasing to 20 trams per hour between Hayes and Shepherd's Bush.

The tram stops will use platforms that provide level boarding, making it easy for people to get on and off. A detailed analysis of tram stop positioning and the relationship with local facilities and communities has been carried out. This will be made available during the public consultation. Of the 67 bus stops currently serving the corridor, it is proposed that 2 will be removed and not replaced, as usage is low. 13 will be removed and be replaced with 6 trams stops more evenly spaced resulting in an additional walk of between 50 and 150m for people using these. The remaining 52 will serve the other bus routes, which use the Uxbridge Road.

There will be 6 key interchanges between the tram and LUL/mainline stations at Uxbridge, Ealing Broadway, Ealing Common, Acton, Shepherd's Bush Hammersmith & City Line and the Shepherds Bush Central Line. Ealing Broadway is high on the list of priorities in TfLs interchange programme. Close attention is also being given in the design to the needs of cyclists, other bus services, pedestrians and taxis. Examples include the interchange at Ealing Hospital, Shepherds Bush and the modifications proposed to Haven Green.

The current plan is for the depot to be sited within the Southall Gasworks development site. TfL is considering options to serve the development site, which is likely to include over 4000 new homes together with light industrial and retail buildings. If progressed, the spur would terminate at Southall Station to link with the Great Western Mainline.

The trams will replace the current 207/607 bus routes. The remaining 13 bus routes would continue to operate over short distances on the Uxbridge Road – especially north / south routes, feeding the tram at various locations such as Uxbridge, Hayes By-Pass, Southall Broadway, Ealing Broadway, Acton Town Hall, and Shepherd's Bush.

#### **3.2 Degree of segregation**

To meet the project objectives the tram has been designed to achieve a high level of segregation from other traffic. The design work to date has been focussed on achieving the best balance between maximising segregation and minimising traffic impacts. Achieving the necessary tram priority requires:

- some reallocation of road space to accommodate the tram;
- some localised road closures;
- some traffic being redistributed to the motorway network;
- giving the tram priority at junctions;
- better management of traffic within the corridor; and
- enforcement of loading and access restrictions.

The current design proposal which will be considered as part of public consultation has evolved since May 2002 when the significant segregation proposed for the tram produced an unacceptable displacement of vehicle traffic onto the existing road network. The May 2002 design required 18 closures along the Uxbridge Road.

The 2003 design proposals, which formed the basis of the status report to the TfL Board in March 2003, reduced the number of closures and involved more sharing of road space by the tram and cars. This design made significant changes but still had 4 full (closed in both directions) and 4 part (one direction) closures. Local people expressed concerns about this design on the grounds that any closure could displace traffic into side and residential streets.

Since February 2003 significant work has been undertaken to address the pinch-points in the town centres of Acton, Hanwell, Southall, West Ealing and Ealing. Local Consultation Groups (LCG's) established in Ealing Borough, have raised 43 options, which have all been evaluated against set criteria. Of the 43 options raised, 18 have been designed in outline and evaluated using the DfT Transport Advisory Guidelines. A further 4 depot options are also being evaluated together with 5 options to access the current proposed depot site. Options have also been analysed in Hammersmith and Fulham (Shepherds Bush) and Hillingdon (Hayes).

The engineering work carried out to review these options has resulted in good stakeholder engagement and positive feedback from the LCG's. Draft options reports were sent to each of the five LCGs in March 2004. Options were discussed in detailed at the last round of LCG meetings and representatives have been asked to send in detailed comments about the views of their group or association. The finalised report will be made available on the TfL website in preparation for the summer public consultation.

This work has now resulted in a design, which will be used as the basis for public consultation in summer 2004. Pre-consultation information in respect of the proposals will be made available shortly.

Table 4 shows the primary changes between 2003 and 2004 as a result of the above process.

**Table 4 – Design Profile Change**

|   | <b>2003<br/>Reference Design</b> | <b>2004<br/>Proposed Design</b> |
|---|----------------------------------|---------------------------------|
| Number of Closures  | 4 Closures and 4 part closures   | 3 Closures and 2 part closures  |
| Segregated including accessible*                          | 93% (19.4km)                     | 70% (14.6km)                    |
| Shared  | 7% (1.5km)                       | 30% (6.3km)                     |
| Capital Costs (excluding optimism bias)<br>(Q4 2002 base) | £425m                            | £463m                           |
| Overall journey time                                      | 65 mins                          | 65mins                          |
| No of stops   | 45                               | 40                              |
| Demand  | 50m                              | 44m                             |

\*Accessible – vehicles can access to pass major constraints (included within fully segregated figure) – 2003: 33% (6.9km) and 2004: 7% (1.5km)

The design has changed the amount of tram segregation and reduced the amount of accessible lanes. The biggest change has been the amount of sharing. Typical cross-sections showing the different levels of tram priority are shown in Annex IV.

### 3.3 Headline project outcomes

The scheme delivers the following overall benefits:

- A doubling of capacity in the peak section in 2011 resulting in reduced crowding and higher public transport use
- Travel times reduced with average speeds improving by 35%
- 35% improvement in reliability by 2011
- Reduced noise pollution and improved air quality
- Public transport accessibility improved - over 300,000 extra people will be within 30 minutes of a local centres, thus supporting regeneration and job growth
- Fully accessible services

### 3.4 Patronage

Bus routes 207 and 607 are among the most heavily used in London, guaranteeing a base level of ridership of 27 million passengers per annum in 2011, for the tram. In addition, there will be transfers from other bus routes, and from car, rail and tube. Growth of trips in the area driven by increases in population and jobs will further boost demand.

Modelling indicates a range of patronage for the WLT between 44 million to 58 million. Given the general experience in the UK of estimating patronage on light rail schemes, a conservative approach has been taken and the lower estimate used as the projected patronage of the tram.

The forecast of 44 million passengers using the tram is broken down as follows:

|                  |                   |
|------------------|-------------------|
| Routes 207/607   | 27                |
| Other bus routes | 7                 |
| Rail/tube        | 2                 |
| Cars             | 4                 |
| New trips/growth | 4                 |
| <b>Total</b>     | <b>44 million</b> |

Annex V shows geographical sources for transfers from public transport, highway (mode shift) and new trips. The highest demand comes from transfers and new trips from Southall eastwards from communities in close proximity to the tram. New trips are most significant in Acton. The least used section is Uxbridge eastwards towards the Hayes By-pass.

## 4. ENVIRONMENTAL IMPACT ASSESSMENT

The Environmental Impact Assessment (EIA) will cover all aspects of the built and natural environment from noise, air quality, ecology, heritage and townscape, to social and economic issues. Work in relation to the EIA has been progressing in parallel with the engineering design proposals. Comments on the Scoping Report have now been received from all three directly affectedly Boroughs and other statutory consultees, (English Nature, English Heritage, the Countryside Agency and the Environment Agency). Communication with all these bodies on environmental issues is continuing.

The design of the scheme has not yet advanced to a point where detailed analysis to assess impacts is possible across the full range of environmental issues. However, preliminary work has been done.

Work to date has focussed on:

- scoping the work;
- establishing baseline impacts in 2011 without the tram; and
- initial modelling of traffic impacts and pollution levels based on the current design.

A summary of the key findings of the EIA work to date is in Annex VI.

TfL will make the environmental study results available throughout the public consultation this summer. This will help inform authorities and local people to understand the impacts of the tram. A detailed EIA would then be prepared based on the final preferred scheme that is proposed for the Transport and Works Order application stage.

## **5. COST AND REVENUES**

The business case has been assessed using the Department for Transport's, Transport Appraisal Guidelines (TAG).

### **5.1 *Best Bus alternative***

The project team has worked with London Buses to develop a feasible best bus alternative against which the project has been assessed. This alternative solution is based on the Intensified Bus Priority (IBP) principles.

A review of the route 207 has identified a number of bus priority schemes, which could reduce current bus journey time on the corridor and increase average bus speeds. The works that comprise this alternative include:

- Larger vehicles (18m articulated);
- Enforcement of bus lanes;
- Traffic management; and
- Junction priority.

Initial estimates from London Buses indicate that this alternative would cost approximately £14.5 million (£20.3 million with 40% risk premium as per Tram) in 2002 Q4 prices.

Work continues to further refine and quantify the best bus alternative in terms of capital, operating and renewal costs and the associated risk premiums.

Other segregated bus schemes such as fully segregated busway, guided bus, trolley bus have been rejected. A *fully segregated busway* would have a high capital cost in the region of £250 million and require extensive land take and property. This is unacceptable to the Boroughs in terms of reallocation of road space and traffic displacement. It would also not give the required capacity. A *trolley bus* has significant capital cost (70% of that of the tram) without the required increase in capacity. A *guided bus* is unlikely to be accepted as suitable technology for this corridor. It is likely to carry a high degree of severance in the road (the guidance requires kerbs in the highway) and would not provide the capacity required.

## 5.2 Capital Costs

The base capital cost (without risk premium) of the project is estimated as £463 million at Q4 2002 base. The risk premium attached to the scheme has been calculated at 40% following an in-depth risk assessment.

Table 5 notes the primary cost changes reflecting the design to date.

**Table 5 – Capital cost changes with current design**

|  | <b>Cost Estimate<br/>(£m Q4 2002 prices)</b> |
|--|--|
| Central Estimate –2003                 | 385  |
| Contingency                            | 40   |
| <b>Sub-total (2003 estimate)</b>       | <b>425</b>                                   |
| Additional costs due to design changes | 38   |
| <b>Subtotal</b>                        | <b>463</b>                                   |
| + 40% risk premium                     | 185  |
| <b>Total (current cost estimate)</b>   | <b>648</b>                                   |

Source: WLT Project Team

The avoided bus infrastructure costs are estimated to be a total of £14.5 million (£20.3 million including risk premium).

## 5.3 Capital Financing Costs

TfL are investigating various ways in which a tram scheme could be procured and financed based on a review of alternative financing structures for light rail projects throughout the UK and the desired procurement and risk mitigation strategy. Should the procurement and risk mitigation strategies change, an alternative financing strategy would need to be considered.

Table 6 below gives an indication of the typical annual payment requirements to meet the initial construction costs should these be capitalised and paid over time as part of a PFI-type structure.

In terms of the operation of the system and procurement of the rolling stock, various methods are being considered with comparisons being made to the light rail schemes that are running elsewhere in the UK. TfL will be developing these models over the next few months.

**Table 6 – Financing Costs and Indicative Payments for debt only**

|                      | <b>Total Capital<br/>Costs (£m)</b> | <b>Land &amp; Utilities<br/>(£m)</b> | <b>Costs to be<br/>financed (£m)</b> | <b>Annual Payment<br/>(over 30 years)</b> |
|----------------------|-------------------------------------|--------------------------------------|--------------------------------------|---|
| <b>Base Estimate</b> | 463                                 | 141                                  | 322                                  | 28.3                                      |
| <b>40% Uplift</b>    | 648                                 | 197                                  | 451                                  | 39.6                                      |

Source: TfL Corporate Finance

The annual payments in Table 6 of £39.6 million (assuming a 40% risk premium) do not include initial up-front costs incurred prior to construction. TfL is considering other ways of financing this element of capital expenditure. Were these to be funded under a prudential borrowing scenario, the annual payments would increase by a further £15 million over the first 25 years.

## 5.4 Operating and Maintenance Costs

The operating and maintenance costs, in 2002 Q4 prices, for the scheme are estimated as £19.3 million per annum including a risk premium of 20% in line with HM Treasury guidance. This compares to the current £13.5 million annual cost to operate the (lower capacity) primary bus routes 207 & 607 that would be replaced by the tram.

### 5.5 *Renewal Costs*

The renewal and maintenance costs for the fixed infrastructure, and a major mid-life vehicle refurbishment, are estimated to be £69.1 million in 2002 Q4 prices including a 20% risk premium, i.e. a further £2m/year over the first 30 years.

### 5.6 *Revenue*

Modelling predicts gross revenue for WLT as £28 million per annum based upon the conservative estimate for annual patronage (44 million). The BCR calculation includes both the new trips generated by the tram and additional revenues of c.£7 million per annum accrued from increased patronage and changes in journey lengths on other TfL modes as a consequence of the introduction of the tram (as predicted by the model).

Table 7 summarises the estimated annualised cost of the tram and bus scenarios. The annualised cost of the tram is £47.9 million. This estimate of £47.9 million is based on supporting the initial demand of 44 million in addition to the capacity to grow in the future. The estimated bus subsidy to support the capacity of 27 million passengers in 2011 is £4.9 million.

**Table 7 – Annualised costs of the tram and best bus scenario**

| (£m)   | Tram scenario | Bus scenario (207 & 607) |
|--|---------------|--------------------------|
| Revenue  | 28.0          | 12.9 <sup>1</sup>        |
| Financing costs                                | -39.6         | -2.0                     |
| Financing of up-front costs                    | -15.0         | 0.0                      |
| Operating costs                                | -19.3         | -15.8 <sup>1</sup>       |
| Renewal costs                                  | -2.0          | 0.0                      |
| <b>Net surplus<br/>(i.e. subsidy required)</b> | <b>-47.9</b>  | <b>-4.9</b>              |

Source: WLT team

1 – Uplifted to 2011 estimates from 2004 numbers

### 5.7 *Net Benefits*

The project delivers passenger benefits of £609 million (discounted over 30 years), comprised of travel time savings, savings in waiting, interchange times, improvements in perceived comfort, improved reliability and reduced boarding penalties.

### 5.8 *Benefit Cost Ratio*

The economic case is based upon a discount rate of 3.5% over a period covering the construction and operation of the scheme (2007 – 2041). The benefit cost ratio of the project is 2.3 assuming the central cost estimate. Using the current project risk premium of 40%, the BCR is 1.5. Benefits accrued from renewal of the highway (e.g. deferred maintenance spending) are not included within this figure.

### 5.9 *Project Development Costs*

Provision in the Business Plan for development costs over the next three years is:

- 3.7 million 2004/05
- 4.6 million 2005/06
- 4.6 million 2006/07

To proceed rapidly with the project, approval will be needed to spend in excess of these funds. This will be considered in the context of the outcome of the public consultation, the Spending Review, a review of the priorities for Major Projects at that time.

## 6. PUBLIC COMMUNICATION AND CONSULTATION

It is essential for the success of application for powers under the Transport and Works Act 1992 that meaningful consultation occurs with affected parties during the detailed planning and environmental assessment work.

There has been broad communication and consultation with major stakeholders, local resident groups and other statutory and non-statutory bodies on the project. Local consultation groups (LCG) have also been established in Ealing borough with 6 rounds of meetings across the borough covering Hanwell, Acton, Southall, West Ealing and Ealing. Table 8 shows the LCG Programme.

**Table 8 - Ealing Local Consultation Group Programme**

| Round | Date       | Issues Discussed   |
|-------|------------|--|
| 1     | March 2003 | Why a tram is required, explanation of the scheme                                |
| 2     | April 2003 | Modelling, Road closures and depot location                                      |
| 3     | June 2003  | Modelling, Tram stop locations and road closures                                 |
| 4     | July 2003  | Options for alignment in town centres, shared running and buses                  |
| 5     | Dec 2003   | Optioneering, traffic modelling data   |
| 6     | March 2004 | Options report, preferred alignment and further traffic modelling data with tram |

Source: TfL Public Affairs

This programme of over 30 local meetings in the last 12 months, supported by over 30 detailed information sheets, has provided participants with an early opportunity to engage in the detailed design of the project, and has influenced the design proposals. In particular, TfL has accepted in principle a greater degree of sharing in constrained areas.

Public consultation is planned to run from June to September 2004. Through this consultation people will be able to comment on the scheme and their comments will receive proper consideration and feedback.

A summary of the key issues raised by consultees in Round 6 of the Ealing Local Consultation Groups is given in Annex VII.

The Case for the Tram brochure was released at the end of March to all major stakeholders.

It is intended to release the following pre-consultation information:

- Route maps showing tram and highway alignment
- Traffic impacts with and without a tram
- Visualisations
- Information Sheets including an Environmental Summary
- Report on LCG process

## 7. APPLICATION FOR POWERS



The route for securing powers to build, maintain and operate the tram will be under the Transport and Works Act 1992. It is proposed that an application for powers be made jointly with one or more of the affected Boroughs (subject to obtaining agreement from the Boroughs). Croydon Tramlink provides a model for such an approach where London Borough of Croydon was a joint promoter with London Transport.

## **8. BOROUGHES**

The London Borough of Hammersmith and Fulham have remained supporters of the scheme and welcomed the changes in design to remove the partial closure at the Shepherds Bush Market. They have been provided with detail on the design for the remodelling of the gyratory and the impacts of traffic to the road network feeding in to the Uxbridge Road.

The London Borough of Ealing has signed a Memorandum of Understanding to develop the project with the possibility of becoming a joint promoter to the Transport and Works Order. They have set aside additional resources to address local traffic management issues in the summer. They have also supported the local consultation process during the past year and are beginning to prepare a local economic evaluation report to determine the impact the tram would have on the corridor.

The London Borough of Hillingdon is a strong supporter for the scheme although officers have recently relayed their concerns about the impact of the Tram on the Borough. These include the loss of one carriageway of road space in each direction, the location/alignment of the proposed Tram route to the Southall Depot site and the need to serve Hayes.

The Royal Borough of Kensington and Chelsea has expressed support in principle for the scheme but need to understand the impacts on traffic.

The other peripheral Borough – Brent, Harrow and Hounslow – are not materially affected but TfL has planned a number of meetings with them. They are broadly supportive of the project through the West London Alliance. TfL is working with all the Boroughs to address a range of key issues and concerns.

## **9. PROGRAMME**

The current programme is as follows.

- Early May Release of pre-consultation information on scheme design
- June to Public Consultation  
September 2004
- Winter 2004/05 TfL Board/Mayor Approval to deposit TWO
- Winter 2004/05 Deposit of TWO Application
- Late Autumn Public Inquiry  
2005
- Autumn 2006 Decision by Secretary of State
- Spring 2007 Start Construction
- Spring 2011 Tram Operational

## **10. RECOMMENDATION**

The Board is asked to note the status of the project and that TfL will proceed with a public consultation commencing in June 2004.

## **ANNEXES**

- I. Map of route
- II. Peak Hour Loading (AM Peak 0700 – 1000)
- III. Deprived Wards – deprivation index and population affected
- IV. Typical Cross sections
- V. Sources and Composition of Tram Patronage
- VI. Environmental status report
- VII. Summary of key issues raised in Local Consultation Groups Round 6