

# D3.4 - IMPLEMENTATION PLAN



POLICY LEARNING IN INFORMATION TECHNOLOGIES  
FOR PUBLIC TRANSPORT ENHANCEMENT

Dissemination level	PP
Component	Component CP3
Author(s)	RBC
Status (F: final, D: draft)	F
Date	January 2014
File name	POLITE Implementation Plan - RBC



### TABLE OF CONTENTS

TABLE OF CONTENTS .....	2
1. Introduction .....	3
2. Policy Context .....	3
3. Strategic Goal 1: Mass Rapid Transit (MRT).....	4
4. Strategic Goal 2: Bus Priority at Traffic Signals.....	6
5. Calculating Bus Delay Savings from a Traffic Signal Bus Priority Installation .....	7
6. Conclusions.....	9
Strategic Goal 1 Action Plan: Implementation of Mass Rapid Transit (MRT) bus priority corridors.....	10
Strategic Goal 2 Action Plan: Implement bus priority at signals at suitable junctions on key bus corridors.....	12

## D3.4 Implementation Plan – RBC

### 1. Introduction

Reading is a large town in the south of England. It has a population of 155,000 (2011), and a larger urban area population of 370,000 (2011). Reading is strategically located to offer its businesses and citizens good access to London and the UK's main international airport at Heathrow. As a major employment and retail centre, with an extensive travel to work area, Reading is a regional transport hub, attracting daily trips from a wide hinterland. Reading also boasts the second busiest railway station in the UK outside of London and offers key public transport links to Heathrow and Gatwick airports, making it a major transport interchange.

### 2. Policy Context

Reading's vision for transport as set out in the Local Transport Plan (2011-26) is that *'people should be able to travel into and around Reading – to and from home, work, leisure or the services they need – easily, safely, comfortably and sustainably'*.

Effective traffic and transport management and efficient use of transport infrastructure is essential to Reading's ability to accommodate the volume of trips which come into and through Reading on a daily basis.

Reading has therefore long embraced the use of Intelligent Transport Systems (ITS) in various forms to help manage traffic and reduce congestion, to keep travelers well-informed, to improve road safety and to encourage change in travel behavior.

Since the commencement of the original Local Transport Plan (LTP) in 2001, through to the recent Local Sustainable Transport Fund (LSTF) bids, efficient and reliable bus services have been at the heart of Reading's vision for its integrated transport system. Some of the principal aims of the LTP vision are:

- To carry out a targeted review of the key bus corridors, including traffic management across the existing bridges, in order to develop options for bus priority and improving public transport reliability.

## D3.4 Implementation Plan – RBC

- To use public transport priority measures and enforcement to reduce delay and improve service reliability across the network where appropriate.
- To consider targeted improvements on the key transport corridors so as to improve bus priority, road safety, and walking and cycling routes.

A key element in any bus service is its consistency. If bus travel is to be seen as a viable and attractive alternative to private cars then services must be on time and consistent. To this end Reading has been working closely with the main bus provider in the area Reading Transport Ltd, to ensure that buses are properly considered in network operation.

Reading's two strategic goals for the POLITE project as set out below both contribute towards the objective of providing more consistent bus services in the urban area.

### 3. Strategic Goal 1: Mass Rapid Transit (MRT)

The implementation of Mass Rapid Transit (MRT) is a key policy for Reading with the objective of creating high-quality public transport corridors offering fast journey times. A major off-highway scheme was developed during 2007-08 as part of a £350m bid to Central Government for Transport Innovation Fund (TIF) funding. A change of Government and the economic crisis resulted in the withdrawal of this funding, however a new funding opportunity has been established by Government through the devolution of Local Growth Fund funding to Local Enterprise Partnerships (LEPs) for major local transport schemes during the period 2015-2010.

In order to take advantage of the new funding opportunity Reading has identified the need to revisit the previously produced MRT proposal. There is a requirement to re-engineer the proposal to reduce the capital costs by reducing the amount of off-street highway works, yet ensuring that a high level of benefit is achieved through a package of measures including the use of ICT to best manage the highway. The MRT proposals will need to be broken down into standalone schemes for individual corridors within the Reading urban area, and phasing of delivery within each corridor. The southern and eastern corridors have been prioritised for delivery, resulting in the South Reading MRT Phases 1 & 2 and

## D3.4 Implementation Plan – RBC

East Reading MRT Phase 1 schemes being included within the Thames Valley Berkshire Local Enterprise Partnership's (LEP) Strategic Economic Plan for the period 2015-20.

During the POLITE project various examples of good practices relating to the implementation of MRT and Bus Rapid Transit (BRT) schemes from around the UK have been identified. It was concluded that of the good practice cases reviewed, the examples from Cambridge and Swansea most closely matched Reading's situation and requirements, as both of these examples include implementation of on and off-street bus priority measures through a constrained highway network.

The key areas of knowledge to be transferred to Reading from the two POLITE good practices are set out below:

### Cambridge case study:

- Inclusion of MRT schemes within local policies and methods of securing funding for the scheme.
- Development of access charging mechanisms to achieve a balance between annual access charge and per km charge for use.
- Understanding of how the scheme has been designed to merge between guided and road operation.
- Experiences of different approaches to ticketing and lessons learnt from the development of a multi-operator ticket.

### Swansea case study:

- Inclusion of MRT schemes within local policies and methods of securing funding for the scheme.
- Lessons learnt from the relationship of the local authority providing the infrastructure and private bus company operating on the route.
- Understanding of how the scheme has been designed to merge between guided and road operation.

## D3.4 Implementation Plan – RBC

The key knowledge to be transferred from the Cambridge and Swansea case studies will enable Reading to re-design the previous MRT proposal to enable affordable standalone schemes to take advantage of the current funding opportunities.

### 4. Strategic Goal 2: Bus Priority at Traffic Signals

The provision of bus priority at signals has been investigated, but as yet has not been implemented widely.

The implementation of bus priority at signals can be achieved in a variety of ways. The most common options are:

- Local signal priority, utilizing equipment locally at each site to detect buses as they approach and then implementing local priority.
- Centrally controlled signal priority, via GPS based systems reporting bus locations with this information being passed to a UTC system which can then implement priority measures according to pre-defined rules.

Each of these methodologies has their own strengths and weaknesses. Locally based systems are generally able to react more quickly to demands, but do not have the ability to determine the potential for priority to negatively impact the network as a whole. Centrally controlled systems tend to be better able to provide priority while maintaining network control, but are not always able to respond quickly enough to provide useful priority at all sites.

Given the extent of Reading's ITS, the preferred method of implementation for bus priority is for it to be based on the latter methodology with GPS tracking units installed on participating buses and priority being implemented through the UTC system, where the decision to provide priority and the extent of that priority, can be dictated by SCOOT. Some work has previously been carried out to implement bus priority at signals in the Reading area with two sites initially set up to trial the system, but a lack of internal staff resources had previously prevented a full investigation into the impacts, and therefore no further sites had been implemented.

## D3.4 Implementation Plan – RBC

During the POLITE project various examples of good practices relating to bus priority at signals from around the UK have been reviewed. It was identified that of the good practice cases reviewed the Bristol implementation most closely matched Reading's situation and requirements.

The main policy aim identified after consideration of Reading's transport vision, the existing network, and lessons learned from the good practice examples, is to target sites only where bus priority can make a real difference. To this end the following objectives have been identified:

- Minimise bus delay
- Prioritise late running buses
- Maintain service headways
- Minimise impact on general traffic and avoid detrimental impact to other bus services.

A key element of Bristol's good practices centered around the evaluation of junctions to assess the benefits, or dis-benefits, which would arise from the implementation of bus priority. As part of this study one of Bristol's Urban Traffic Control Officers produced a methodology of how to calculate average likely delay savings at a junction.

This methodology is summarized briefly below but it should be noted that this is a coarse calculation method and the following assumptions inherent in the calculations:

- Every bus priority request is serviced (This is untrue as not every bus is equipped, and when running under SCOOT not every request is serviced).
- Running bus priority will cause no disruption to the traffic conditions, which may affect subsequent buses (This is untrue; bus priority frequently can produce a dis-benefit to traffic, negatively affecting subsequent buses).
- No conflicting bus priority demands are being serviced (This can be untrue, as demands can be received simultaneously on different junction approaches).

### 5. Calculating Bus Delay Savings from a Traffic Signal Bus Priority Installation

For each approach that may be given bus priority, the following should be ascertained:

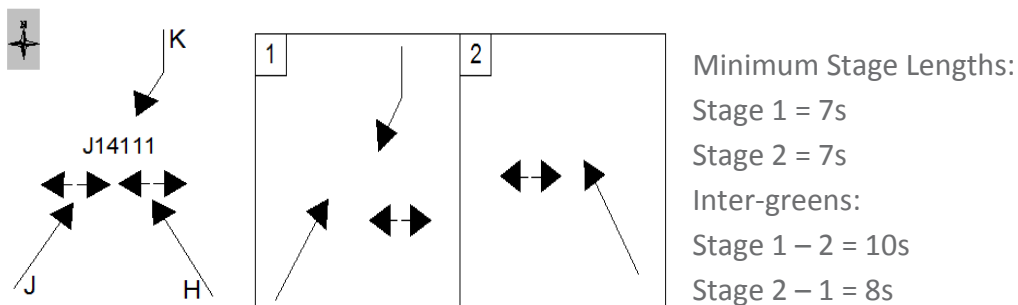
- 1) Bus free flow journey time from detector to stop-line (t)

## D3.4 Implementation Plan – RBC

This can be calculated by direct measurement, or by estimation. For example at 22mph, the distance from detector to stop-line would be dividing by 8.3m/s.

- 2) Average cycle time of the junction during the Am peak, off peak and PM peak periods (c)  
This can be taken from records held in the UTC system, or estimated from a model.
- 3) Average effective green time during AM peak, off peak and PM peak periods (g)  
This can be taken from records held in the UTC system, or estimated from a model.
- 4) Average red time during AM peak, off peak and PM peak periods (r)  
This is the cycle time minus the green time (c-g).
- 5) For each potential bus priority demand, calculate the minimum cycle time to return to the bus stage (MinC). This is the sum of all inter-green periods plus the minimum stage lengths.

Example:



Bus priority on H:  
 $\text{MinC} = 8 + 7 + 10 = 25$

Bus priority on K:  
 $\text{MinC} = 10 + 7 + 8$

To identify the potential bus delay savings carry out the following calculations:

- Proportion of buses gaining no benefit (P1):  $P1 = (g-t)/c$
- Total delay saving:  $= ((t/c) \times r) + ((r/c) \times (r-\text{MinC}/2))$

To aid this process Bristol had produced a spreadsheet which would carry out the calculations once populated with the required information. This was shared with Reading along with other extremely useful information.



## D3.4 Implementation Plan – RBC

Full details of Bristol' experiences were shared with Reading, with the principal officer from Bristol, having based a Master's dissertation on the subject, providing all the relevant elements from this including the literature review carried out to identify the optimum methodology for assessment.

The key lessons to be transferred from the Bristol case study therefore are focused on the evaluation of which junctions are suitable for bus priority, and the detailed SCOOT configuration knowledge which has been shared by Bristol following their investigations and analysis.

### 6. Conclusions

POLITE's aim is to improve local policies related to the development & management of mobility information systems in order to enhance safety, security & efficiency of the transport systems as well as the "travel" experience of visitors. In accordance with these goals, Reading Borough Council has developed an implementation plan to improve local policies relating to the implementation of bus priority measures to improve service provision and therefore encourage the use of sustainable transport within the Reading urban area.

## D3.4 Implementation Plan – RBC

<b>Strategic Goal 1 Action Plan: Implementation of Mass Rapid Transit (MRT) bus priority corridors.</b>		
1	specific actions including technical, regulatory & financial aspects	<ul style="list-style-type: none"> <li>• Good practice review outlining the key policies critical to the good practice success.</li> <li>• Review these policies in the context of the existing MRT policies and identify areas where ICT can improve these policies.</li> <li>• Use key information to assist the outline reengineering of the current policy proposals to inform the business case.</li> <li>• Use the policies to support the drafting of the business case to the LEP to secure funding.</li> </ul>
2	obstacles and measures for the alleviation of risks in implementation	<ul style="list-style-type: none"> <li>• Potential for cost increases through requirements for utility diversions and surface water drainage alterations.</li> <li>• Potential for objections through the statutory consultation TRO process.</li> <li>• Potential for objections through the planning process.</li> <li>• Requirement for environmental consents / mitigation measures.</li> </ul>
3	Steps	<ul style="list-style-type: none"> <li>• Develop concept design for the South and East Reading MRT schemes including a phased approach to delivery.</li> <li>• Prepare the initial business case for both schemes to secure indicative funding allocations through the Growth Fund.</li> <li>• Develop the full business case for each scheme to secure financial approval from the LEP.</li> <li>• Undertake detailed design and secure planning permission where required.</li> <li>• Procure a contractor to undertake the works and implementation.</li> <li>• Undertake evaluation of the scheme after 1 and 5 years after opening.</li> </ul>
4	responsible bodies	<ul style="list-style-type: none"> <li>• Reading Borough Council</li> <li>• Wokingham Borough Council</li> <li>• Thames Valley Berkshire Local Enterprise Partnership</li> <li>• Department for Transport</li> </ul>
5	actors to be involved	<ul style="list-style-type: none"> <li>• Reading Borough Council</li> <li>• Wokingham Borough Council</li> <li>• Thames Valley Berkshire Local Enterprise Partnership</li> <li>• Department for Transport</li> </ul>

## D3.4 Implementation Plan – RBC

		<ul style="list-style-type: none"> <li>• Reading Buses</li> <li>• Other bus operators</li> <li>• Green Park</li> <li>• Thames Valley Park</li> <li>• Landowners</li> </ul>
6	Resources	<ul style="list-style-type: none"> <li>• Local Growth Fund</li> <li>• Private sector contributions</li> <li>• RBC resources</li> </ul>
7	timeframe & deadlines	<ul style="list-style-type: none"> <li>• Concept design – Complete</li> <li>• Initial business case – Complete (Mar 2014)</li> <li>• Indicative funding secured – Complete (Apr 2014)</li> <li>• Full business case – Aug 2015</li> <li>• Independent assessment of business case – Sep 2015</li> <li>• Financial approval – Nov 2015</li> <li>• Detailed design – Dec 2015</li> <li>• Procurement – Mar 2016</li> <li>• Construction – Sep 2018</li> </ul>
8	monitoring and controlling process	<ul style="list-style-type: none"> <li>• Monthly review of work schedule execution – milestones.</li> <li>• Monitoring of journey times and patronage levels along affected corridors both before and after MRT implementation.</li> <li>• Monitoring of bus journey times and patronage levels along affected corridors both before and after MRT implementation.</li> </ul>

## D3.4 Implementation Plan – RBC

<b><u>Strategic Goal 2 Action Plan: Implement bus priority at signals at suitable junctions on key bus corridors.</u></b>		
1	specific actions including technical, regulatory & financial aspects	<ul style="list-style-type: none"> <li>• Identify junctions which will provide real benefits through the application of bus priority.</li> <li>• Produce a ranked priority list based on the findings of the junction assessments.</li> <li>• Trial and evaluate on a selection of the junctions with the highest potential benefits.</li> <li>• Evaluate results</li> <li>• Roll out to other junctions while monitoring to ensure benefits are being realized.</li> </ul>
2	obstacles and measures for the alleviation of risks in implementation	<ul style="list-style-type: none"> <li>• Potential for high bus priority demands to negatively impact junctions to be mitigated through initial evaluation and post implementation monitoring.</li> <li>• Support the ongoing implementation and optimisation through training of in-house staff during the initial implementation phase.</li> <li>• Priority measures will not function for buses not currently active in the RTPi system. Therefore all operators will be encouraged to participate in the RTPi system and ensure that on-bus systems are fully operational.</li> <li>• Funding</li> <li>• Priority measures can only be truly effective in junctions with some spare capacity. Therefore only junctions where capacity is present and benefits can be anticipated will be included.</li> </ul>
3	Steps	<ul style="list-style-type: none"> <li>• Evaluation and identification of junctions</li> <li>• Ranking of suitable sites</li> <li>• Trial and monitoring of initial sites</li> <li>• Evaluation of results</li> <li>• Roll out to remaining sites</li> <li>• Ongoing evaluation of implemented sites</li> </ul>
4	responsible bodies	<ul style="list-style-type: none"> <li>• Reading Borough Council</li> </ul>
5	actors to be involved	<ul style="list-style-type: none"> <li>• Reading Borough Council</li> <li>• Reading Buses</li> <li>• Other bus operators</li> <li>• RTPi operator (Nimbus)</li> <li>• UTC Provider (Siemens)</li> </ul>
6	Resources	<ul style="list-style-type: none"> <li>• RBC resources.</li> </ul>

## D3.4 Implementation Plan – RBC

7	timeframe & deadlines	<ul style="list-style-type: none"> <li>• Evaluation and identification of junctions – Feb 2015</li> <li>• Ranking of suitable sites – Feb 2015</li> <li>• Trial and monitoring of initial sites – Apr/May 2015</li> <li>• Evaluation of results – Jun 2015</li> <li>• Roll out to remaining sites – Summer – Autumn 2015</li> <li>• Ongoing evaluation of implemented sites</li> </ul>
8	monitoring and controlling process	<ul style="list-style-type: none"> <li>• Monthly review of work schedule execution – milestones.</li> <li>• Monitoring of journey times along affected corridors both before and after priority implementation.</li> <li>• Monitoring of bus journey times along affected corridors both before and after priority implementation.</li> </ul>