

Traffic Management and Control

Report to the City Council

04 April 2006

Traffic Management and Control



domenic.de.bechi@birmingham.gov.uk

www.birmingham.gov.uk/scrutiny

Traffic Management and Control

Contents

Preface	3
Summary	4
Summary of Recommendations	5
1 Background	8
1.1 Why Examine Traffic Management?	8
1.2 How we did the Review	9
1.3 Acknowledgements	10

Traffic Management and Control

Preface

By Councillor Alistair Dow
Chair, Transportation and Street Services
Overview and Scrutiny Committee



Traffic Management and Control

Summary

Congestion within our transport networks and particularly our roads is one of the most significant issues that Birmingham faces. Tackling it is high on the list of public priorities, because it affects almost everyone in some way. It is a fact that levels of road traffic are increasing and are forecast to do so in the future. Given the time taken to introduce changes to the infrastructure of the transport

Traffic Management and Control

Summary of Recommendations

	Recommendation	Responsibility	Completion Date
R1	A protocol should be developed setting out: <ul style="list-style-type: none">• How the traffic effects of proposed new schemes and developments will be evaluated. This should take account of effects on the immediate vicinity and the wider area:	Cabinet Member for Transportation and Street Services and Director of Planning and Regeneration	31 December 2006

Traffic Management and Control

	Recommendation	Responsibility	Completion Date
R8	Opportunities for extending the CCTV available to UTC should be explored through new-build infrastructure paid for as part of Section 106 Planning monies. This should result in: <ul style="list-style-type: none">• Additional CCTV being available for use by UTC;• Subject to the availability of new developments in those areas, be in line with the priorities for traffic CCTV in recommendation R5; and• The Capital and / or Revenue costs of the additional CCTV being paid for through s106 obligations.	Director of Planning and Regeneration	31 January 2007
R9	Proposals for a combined permit scheme for	Cabinet Member for	Within 12

Traffic Management and Control

1 Background

1.1 Why Examine Traffic Management?

- 1.1.1 Congestion is one of the greatest challenges facing Birmingham and many British cities. In essence, it boils down to simple mathematics.

Traffic Management and Control

- 1.1.6 Traffic management and control systems include a complex range of inter-related mechanisms through which those with responsibilities for tackling congestion can influence and control traffic flow. This includes not only Birmingham City Council, but also neighbouring local authorities, the Highways Agency and the Police.
- 1.1.7 In conducting this review, we have sought to evaluate the current effectiveness of the systems by which traffic is planned, monitored and controlled. This is with a view to making recommendations that impact positively upon how the highway is managed, now and in the future.

1.2 How We Did the Review

- 1.2.1 The review was conducted by a team of three members of the Committee, led by the Chair, who met regularly to discuss the progress of the review and to agree the findings and recommendations.

Traffic Management and Control

1.3 Acknowledgements

1.3.1 We would like to thank the following people for their contributions to this review:

- Staff from the Development Directorate, including: John Culligan (Head of Service Development - Planning), Steve Grant, (Technical Officer), Chris Haynes, (Policy Manager), Alan Lloyd (Traffic Manager), Mike Nixon (Resources Manager, Urban Traffic Control), Paul O'Day (Network Manager).
- Steve George, CEPOG Core Support Team, MATTISSE Project Leader.

Traffic Management and Control

2 About Traffic Management

Key points in this section

- How we measure congestion
- Who is responsible for managing traffic

Traffic Management and Control

2.2.3 To create a baseline, journey times are measured on selected routes in free-flowing conditions and then at other times. The following measures are calculated, particularly 7am to 10am:

- Average delay per vehicle;
- Average delay per person/ vehicle per km;
- Number of people passing along the route/ time period.

2.2.4 One of the difficulties in defining congestion (a problem that the DfT also has) is that it is relative to the individual's circumstances and expectations. Personal perspective is at the heart of the problem. There is little debate about congestion existing where traffic is not moving. The argument concerns the shades of grey: when does 'slow-moving' become 'congested'?

Traffic Management and Control

2.3.3 The TMA aims to tackle congestion and reduce disruption in England and Wales. It brings together a number of other Acts of Parliament (including the Traffic Regulation Act 1984 and The Transport Act 2000). The Act affects the City Council in a number of ways, due to the role it has as:

- Highway Authority: Looking after the infrastructure and the network;
- Traffic Authority: Managing the flow of traffic and functioning of the Highway and on-street and off-street parking;
- Street Works Authority: Co-ordinating utilities and other street works.

2.3.4 The Act is being implemented in stages, with the first part activated in

Traffic Management and Control

3 Planning to Manage Traffic

Key points in this section:

- Description of the city's highway network
- How traffic is controlled
- How we can assess the effects of changes
- The effect of developments in the city

Traffic Management and Control

The key routes are shown in the map in Fig. 1 below and form part of the Primary Route Network.



Traffic Management and Control

3.1.4 The City is also at the heart of the national motorway network, surrounded by the 'Midlands Box' of motorways. This is formed by the M6 / M6 Toll, M5 and M42 motorways. Although these motorways are managed by the Highways Agency, rather than the City Council, there are still important interfaces with the A-road network, in particular the Aston Expressway linking the motorway with the City Centre. Any congestion on these motorways has a knock-on effect on the City's roads and vice versa.

3.1.5 There are particular characteristics about the highway network that the City has that make it susceptible to congestion:

- The City is at the heart of the West Midlands region, being both a focus for travel in the region and *en route* for those passing through;

Traffic Management and Control

3.3 Highway Design

3.3.1 Highway engineers use a range of measures in designing roads to optimise the flow of traffic. These are mostly used at junctions, where reducing a build-up of traffic is critical if congestion is to be avoided. The measures include:

- Traffic signals and crossings;
- Traffic islands;
- 'Grade separation' by use of flyovers or underpasses;
- Road width and number of carriageways, including the lanes on approach to junctions or signals;

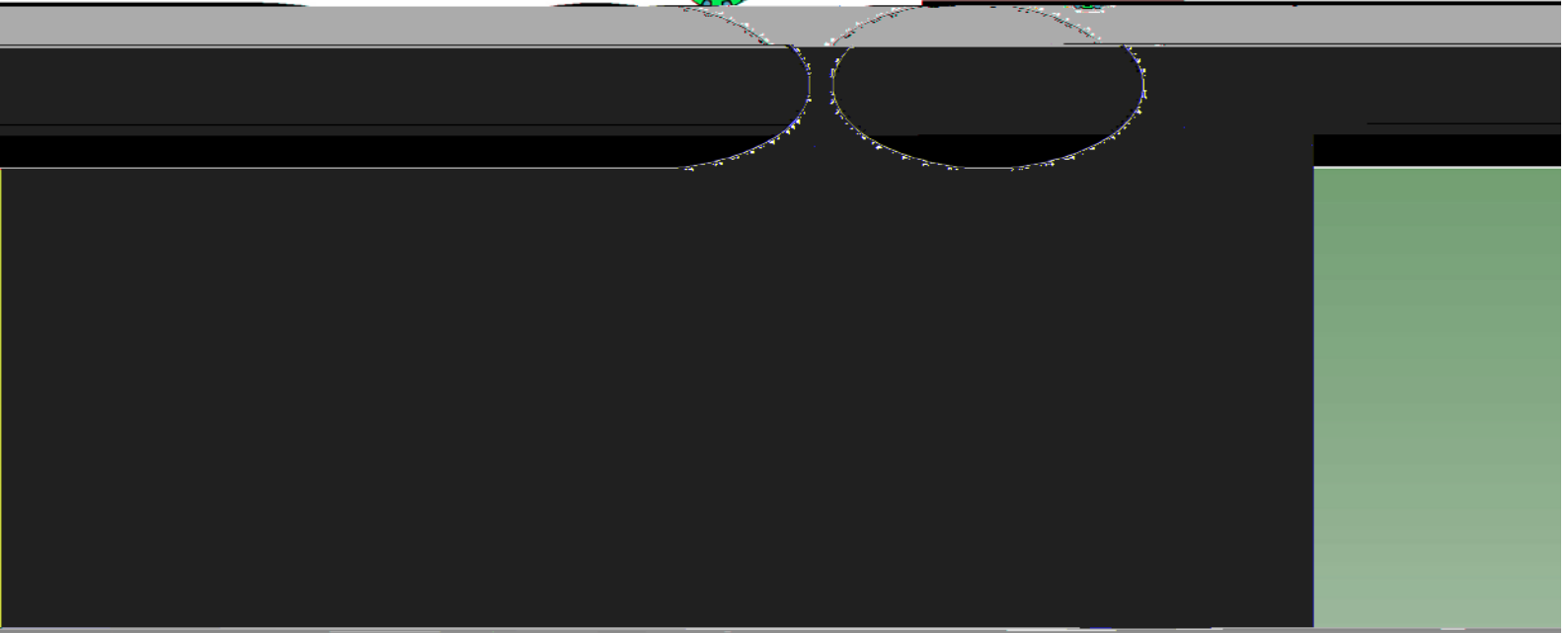
Traffic Management and Control

- 3.4.4 The model is built using a range of data, including census information, surveys and household interviews. It is designed to support a range of potential policy areas, including land use planning, the development of Bus Showcase routes and parking policies. Nevertheless, this model is strategic and more local analysis is necessary e.g. micro simulation, for specific impact.
- 3.4.5 The City Council also uses the SATURN modelling system. The SATURN Highways Network Model is used for reviewing area-wide effects particularly in the City Centre. When larger schemes are assessed, one or more systems are used as the network as a whole needs to be looked at to take in other influential factors such as parking and trips generated from developments.
- 3.4.6 Modelling is not an exact science. There is a misconception that traffic

Traffic Management and Control

3.5.2 ITS uses modern computing, communications technologies and real-time data from a range of sources to:

-



Traffic Management and Control

3.5.9 A wealth of information is therefore available. The difficulty lies in getting people to use it. To date there has been little publicity with

Traffic Management and Control

3.6.2 Three years ago, the local authorities formed a ten-year partnership with Mott MacDonald and Telent (formerly Marconi) to deliver MATTISSE more effectively.

3.6.3

Traffic Management and Control

3.7 Controlling Traffic

- 3.7.1 Traffic modelling, although highly technical and detailed, remains a relatively inexact science. It attempts to model patterns of behaviour based on an understanding of where people want to travel to and from, and the capacity of the routes to get them there.
- 3.7.2 The infrastructure, information systems and traffic control equipment on the highway network is highly complex, with a vast number of variables and interactions. The key to effective use of this equipment lies in the ability to co-ordinate its control and using it for disseminating the information on which people make choices during their journeys.
- 3.7.3 In the course of looking at the infrastructure and information systems that are used by other authorities, we found a number of interesting

Traffic Management and Control

3.7.9 In looking to exercise some control over traffic, it is important to remember that there are also events that cannot be controlled:

- Emergency streetworks to repair utilities such as gas and water mains;
- Where the Police need to preserve or isolate a scene of crime;
- Closures and events on road networks controlled by another controlling agency, e.g. the Highways Agency.

Traffic Management and Control

4 Relationships: Systems in Operation

Key points in this section

- Relationships and responsibilities between different agencies
- What these agencies do and how they work together
- Examples of significant traffic incidents

Traffic Management and Control

Highways Agency

Traffic Management and Control

4.2 The National Traffic Control Centre (NTCC)

- 4.2.1 Located in Quinton, and operated on behalf of the Highways Agency by Traffic Information Services Ltd, the NTCC is at the heart of the government's plan to manage traffic on the nation's trunk roads and motorways more effectively. This £160m project uses one of the most advanced systems in the world to collect data on road conditions and disseminate it.
- 4.2.2 Loop sensors have been placed on 8,000 sections of road and they measure changes in the volume of traffic. There are also Automatic Number Plate Recognition Cameras which measure journey times of particular vehicles over specific sections of road and so can detect

www.traffic-england.com

Traffic Management and Control

- Operating procedures on how information is shared and the notice for this;
- How reciprocal use of resources such as VMS will work;
- Known special events that may cause traffic (e.g. sporting and cultural events).

4.3 The Regional Control Centre (RCC)

- 4.3.1 The Highways Agency is implementing a network of seven regional control centres across England, to be jointly staffed by the Police and the Highways Agency. The centres will be rolled out over a period of time to cover motorways and some key trunk roads within each region

Traffic Management and Control

4.4.2 As we have seen with legislation such as that relating to Decriminalised Parking Enforcement, there is a progressive trend away from having the

Traffic Management and Control

Signalised Installations

- 4.5.3 There are around 1,000 signal junctions and controlled pedestrian crossings in Birmingham. Of these, around half can be controlled by the UTC. The amount of signals it controls has increased by around 20% over the last four years.
- 4.5.4 The key element in signal control is a system of loop array sensors which indicate to the control system when vehicles pass across them. The loops that detect the traffic are normally placed 150 to 200 metres ahead of the signals. The equipment is controlled by the following systems:
- **SCOOT** (Split Cycle Optimisation Offset Technique - 451 signal sites): These signals work in small cells where timings adapt

Traffic Management and Control

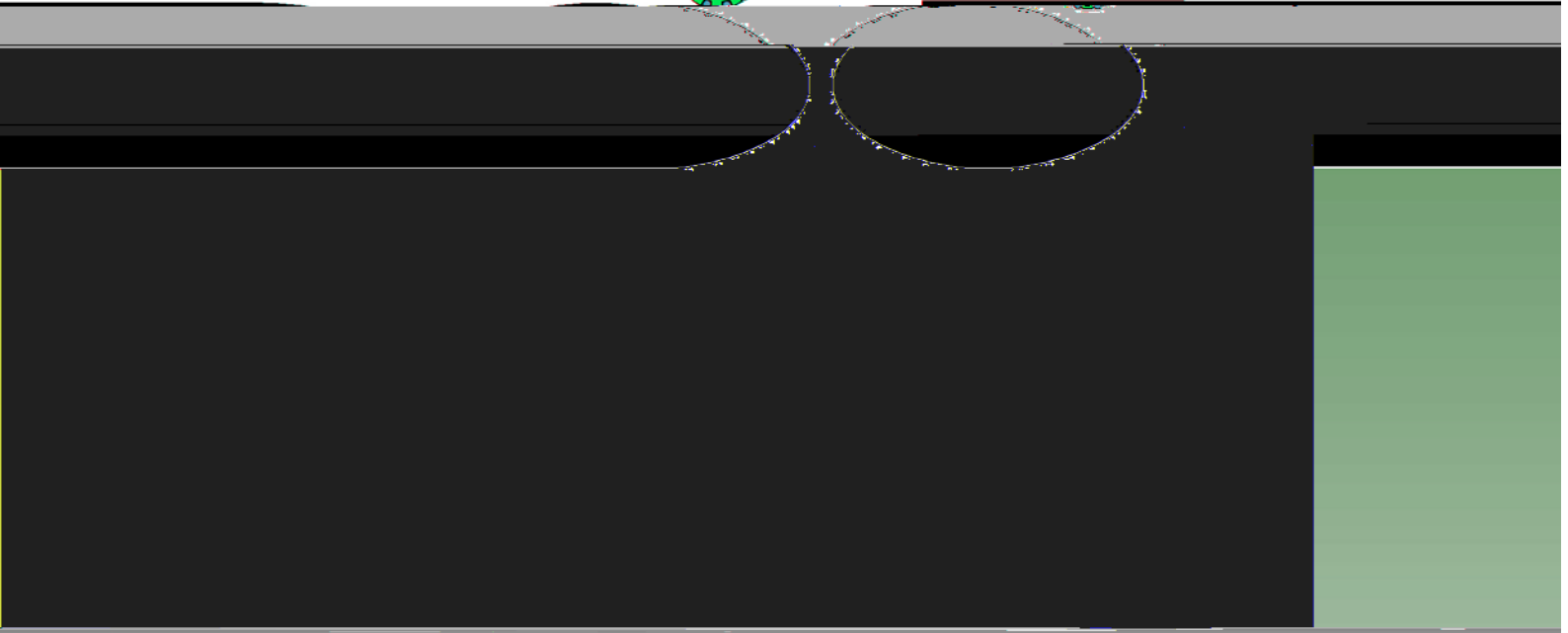
- 4.5.9 However, there are many cameras around the city that are used for other purposes (such as to detect public order and vehicle offences). Around 400 of these cameras are accessed from the rooms adjoining the UTC. The initial intention had been for these images to be shared with the UTC but this has not happened.
- 4.5.10 There is an issue with privacy. People and vehicles can be identified using the police cameras but Codes of Practice regarding CCTV use are in place and could easily be adapted to encompass the sharing of CCTV images. Sharing images and infrastructure would not only provide a more complete view of the city but could also reduce revenue costs.

Traffic Management and Control

4.6.3 The Act does however place responsibility for managing traffic on the authority as a whole. This includes the Planning and Regeneration Department and it is incumbent on everyone to consider traffic implications. The only practical way to do this is through good communication.

4.6.4 There are three levels to communication on such issues within the Council:

- At a political level, the Cabinet Member for Transportation and Street Services and the Chairman of the Planning Committee;
- At an officer level, the Traffic Manager is part of the Development Officers Group, which discusses major developments; and
- At an operational level, between Planning Development Officers



Traffic Management and Control

4.8 Improving Relationships

4.8.1 There are two main relationship interfaces through which the City Council (i.e. UTC) manages traffic:

- West Midlands Police and
- The Highways Agency.

Of these, the most problematic were cited as relations with the Police. These were described as "not very effective" and "inconsistent".

Traffic Management and Control

- 4.8.7 These new responsibilities have limited impact upon the City Council as there were already established operational relationships with the Highways Agency through the RCC. Since the RCC has relocated from Perry Barr to Quinton, these relationships have continued.
- 4.8.8 Maintaining these good relationships is critical as work undertaken by the Highways Agency on the motorway

Traffic Management and Control

5 Future Opportunities

Key points in this section

- The national policy picture
- Future changes that will affect traffic management
- Funding secured and available opportunities for funding

Traffic Management and Control

5.2 The Highways Maintenance and Management Private Finance Initiative (PFI)

- 5.2.1 Birmingham's developing proposal for a Highways Maintenance and Management PFI encompasses many aspects of traffic signal maintenance and management. A key part of the PFI approach is that it provides a guaranteed level of investment and service in a long-term finance deal (25 years). The Core Investment Period (i.e. the first 5 years) of the contract includes for a substantial investment in the replacement of old traffic signal controllers and also upgrade of the current Urban Traffic Control system to Urban Traffic and Control (UTMC) standards.
- 5.2.2 There is still a long way to go before the City Council enters into any PFI

Traffic Management and Control

- 5.2.6 The particular advantage in this arrangement for the City Council is that there is greater certainty about costs. This is so that departmental budgets don't get squeezed to accommodate greater on going revenue costs. Any maintenance costs for new investments must be accounted for through the initial investment proposals and costings.
- 5.2.7 Additionally, risk is transferred to the PFI contractor and they are remunerated according to their performance in managing and maintaining the highway infrastructure. If their performance is unsatisfactory, then there will be appropriate payment deductions.
- 5.2.8 Part of the PFI proposal relates to the need to replace traffic signal controllers that are beyond their expected working life of 15 years. At present, more than 25% of the Council's signal controllers are older than 15 years. At the end of the PFI contract, no signal controllers

Traffic Management and Control

Scheme Band		Number of Suggestions	Examples
Quick Win	Done	10	<ul style="list-style-type: none"> • Minor works • Signal timings / efficiencies • Enforcement
	Funded	36	
	Unfunded	2	
	Ongoing	7	Policy measures to encourage change of travel mode
Medium Term		144	

Traffic Management and Control

5.5 Planning Agreements

- 5.5.1 It was apparent from the experience in other local authorities that there might be a missed opportunity in the city regarding the use of Section 106 Planning Agreements. Among other things, these agreements may be used to fund both capital investment in traffic management infrastructure and the revenue costs of maintaining it.
- 5.5.2 The City Council has used these in the past such as the redevelopment of the Bull-Ring and introducing the Bus Mall. However, it was apparent that other authorities (for example, Wolverhampton City Council) appear to have used them more effectively. This is through recognising opportunities to extend the benefits that new developments bring, wider than the development itself.

Traffic Management and Control

- Contribution to central government, local and regional objectives;
- The amelioration of identified problems.

TIF schemes will need to provide 'high' value for money and have benefits that are at least twice the costs.

5.6.4 The West Midlands has won pump-priming funding for £2.6m to help assess the feasibility of schemes that combine demand management, such as road pricing, with better public transport, in order to tackle congestion.

5.6.5 This is more than twice the amount of money the sub-region bid for. This is seen by some as a clear indication that the Government is keen for road pricing to be piloted here. It does have to be remembered, however, that securing pump-priming money is no guarantee that an

Traffic Management and Control

- 5.6.9 Road Pricing is not a new concept. In the 1960s the *Traffic in Towns* report put forward road pricing as a way of reducing travel demand. Nearly forty years later following the 1998 White Paper, *A New Deal for Transport*, Local Authorities were given powers to introduce road user charging by the Transport Act 2000.
- 5.6.10 In July 2003 the Government published *Managing Our Roads*. This document discussed various options for reducing the pressure on the road network, including road charging. At the same time, a feasibility study was commissioned to look into the viability of implementing a national road pricing scheme.
- 5.6.11 The study found that:
- Public support is critical if road pricing is to work;

Traffic Management and Control

- 5.6.14 The key to a national road pricing scheme is utilising technology which can charge by time, distance and place. The Transport Secretary, Alistair Darling, has said that road pricing should “piggy-back” on currently available systems such as those for satellite navigation and real-time information. However, estimates are that such a system will not be available in a mass-market, low-cost form, until at least 2014.

5.7 Summary

- 5.7.1 Any look to the future in transportation involves a high degree of dependency on the direction taken by the government. After all, it is they who hold the purse strings. In

Traffic Management and Control

6 Conclusions and Recommendations

6.1 Introduction

Traffic Management and Control

Conclusions

1. *The role of the Traffic Manager is one that the City Council is required to have by law. However, the Council has obligations to manage traffic that are wider than those defined by statute.*
2. *These obligations must be taken seriously as they underpin the capacity for economic and social development in the city through the transport systems that serve communities.*
3. *The principles of the Traffic Management Act must be embedded into the organisation. All areas of the Council that can affect traffic must understand that the Act places obligations upon them.*
4. *The Planning Committee (and its supporting officers) are a case in point. There is a need to be cognisant of the authority's obligations to comply with not only the Planning Acts but also the Traffic Management Act.*
5. *Proposed changes that affect road capacity or volume of road use need to be subjected to rigorous appraisal for their knock-on effects in how traffic is dispersed.*
6. *Additionally, there is a need for the Planning Committee to be informed by expert opinion where significant new developments in the city may create adverse traffic consequences. Written views of the Traffic Engineers are considered for each application and an Engineer also attends each meeting*

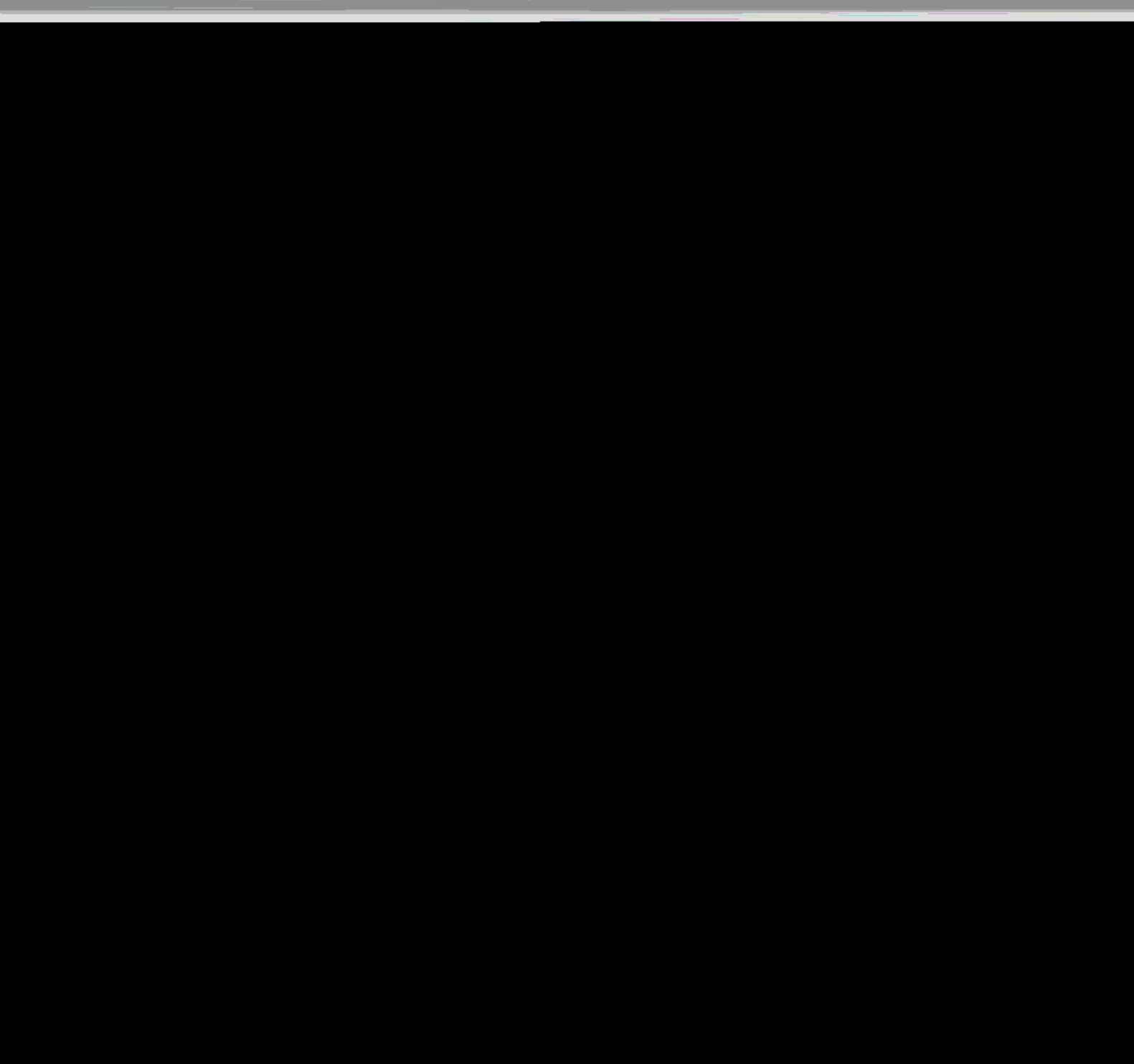
Traffic Management and Control

6.3 Relationships with Others

6.3.1 Although the Traffic Management Act has been in place for nearly two years, many of the Council's relationships for managing traffic on an inter-agency basis are under-developed. This was evident particularly from our discussions with the Police.

6.3.2 There are and always will be competing priorities and objectives in dealing with congestion incidents between the Police and Traffic Authorities. However, there is also an important step to be taken in developing channels of communication with external organisations.

6.3.3

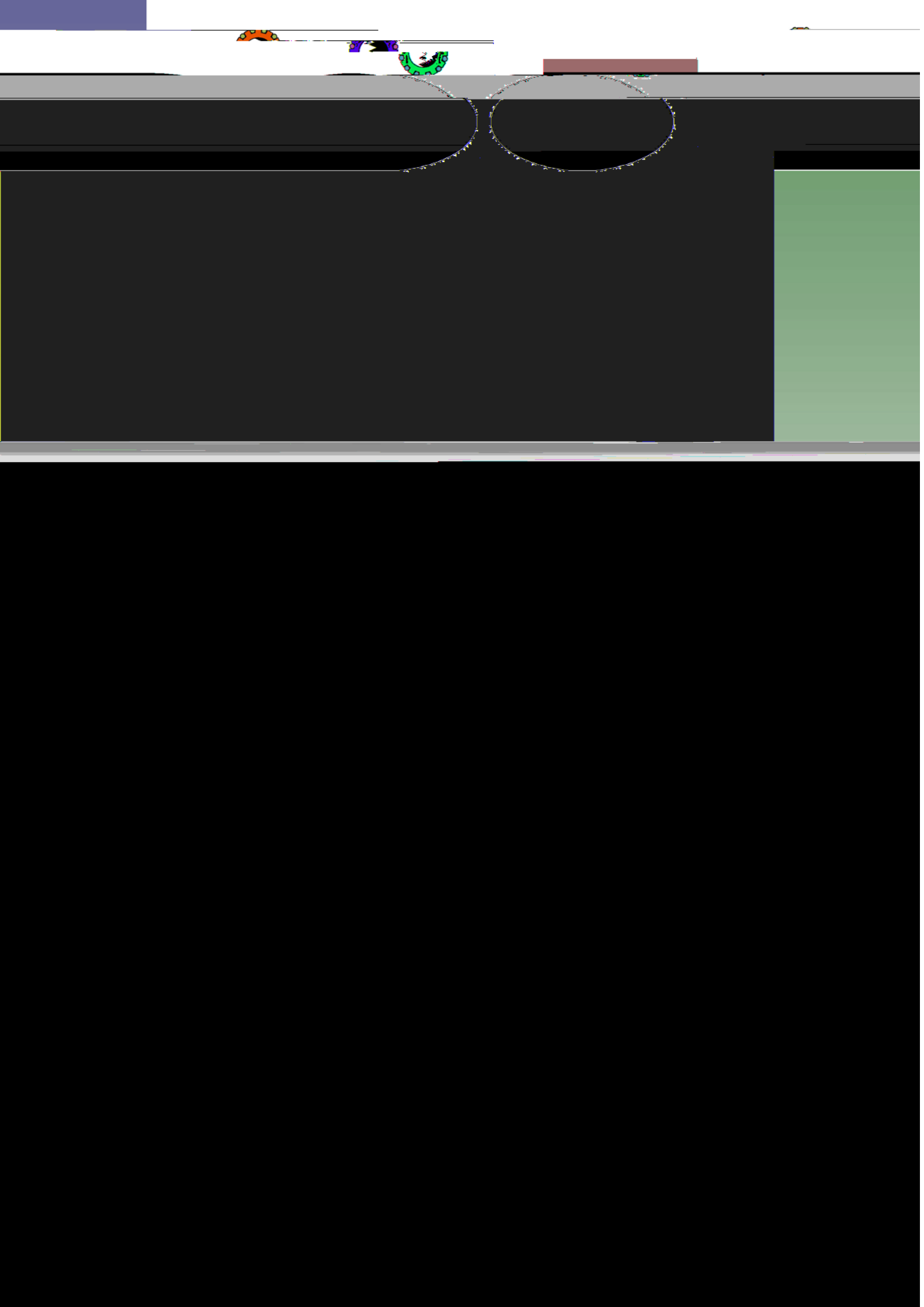


Traffic Management and Control

- 6.4.5 Some investment can be expected through the Highways Management and Maintenance PFI. Here, there are opportunities to use modernisation investment to reduce operating costs. For example, trials on wireless technology have been commissioned to determine if this technology is suitable for the demands of the UTC system and would result in a cost saving. Draft conclusions are expected in September 2006. When we renew assets, we should be looking for achieving cost efficiencies.
- 6.4.6 We feel that a smarter approach in the future should also involve sharing of resources and assets. This is not just within the City Council, but also with other public organisations that have infrastructure that it would be beneficial to share. This is simply a way of making public money go further, irrespective of which part of the public sector holds the purse strings.

Traffic Management and Control

18. *Highways infrastructure is often an important part of developments. Other authorities have successfully used means such as Section 106 Planning obligations to draw in capital and revenue contributions for any changes that need to be made. Whilst we have seen evidence that Birmingham does do this to an extent, our impression is that this is not as effectively utilised as it is in other authorities.*
19. *Opportunities to extend traffic CCTV need to be taken through (i) better use of the considerable CCTV infrastructure that already exists in the city and (ii) considering priorities for traffic CCTV as part of other highway infrastructure improvements.*
20. *It should be a matter of Council policy that opportunities to extend traffic CCTV are considered as part of changes to infrastructure on the highway network. Consideration also needs to be given to the ongoing revenue costs of additional CCTV cameras.*



Traffic Management and Control

	Recommendation	Responsibility	Completion Date
R11	<p>A policy should be developed for Intelligent Transport Systems.</p> <p>This should cover:</p> <ul style="list-style-type: none">• A strategic framework for what systems are needed for the future;• Priority areas for their development and introduction;• Requirements for compatibility, to ensure that different elements contribute to the overall strategy.	<p>Cabinet Member for Transportation and Street Services</p>	<p>30 June 2007</p>

Traffic Management and Control

Appendix 1 Jargon Busting

Traffic Management and Control

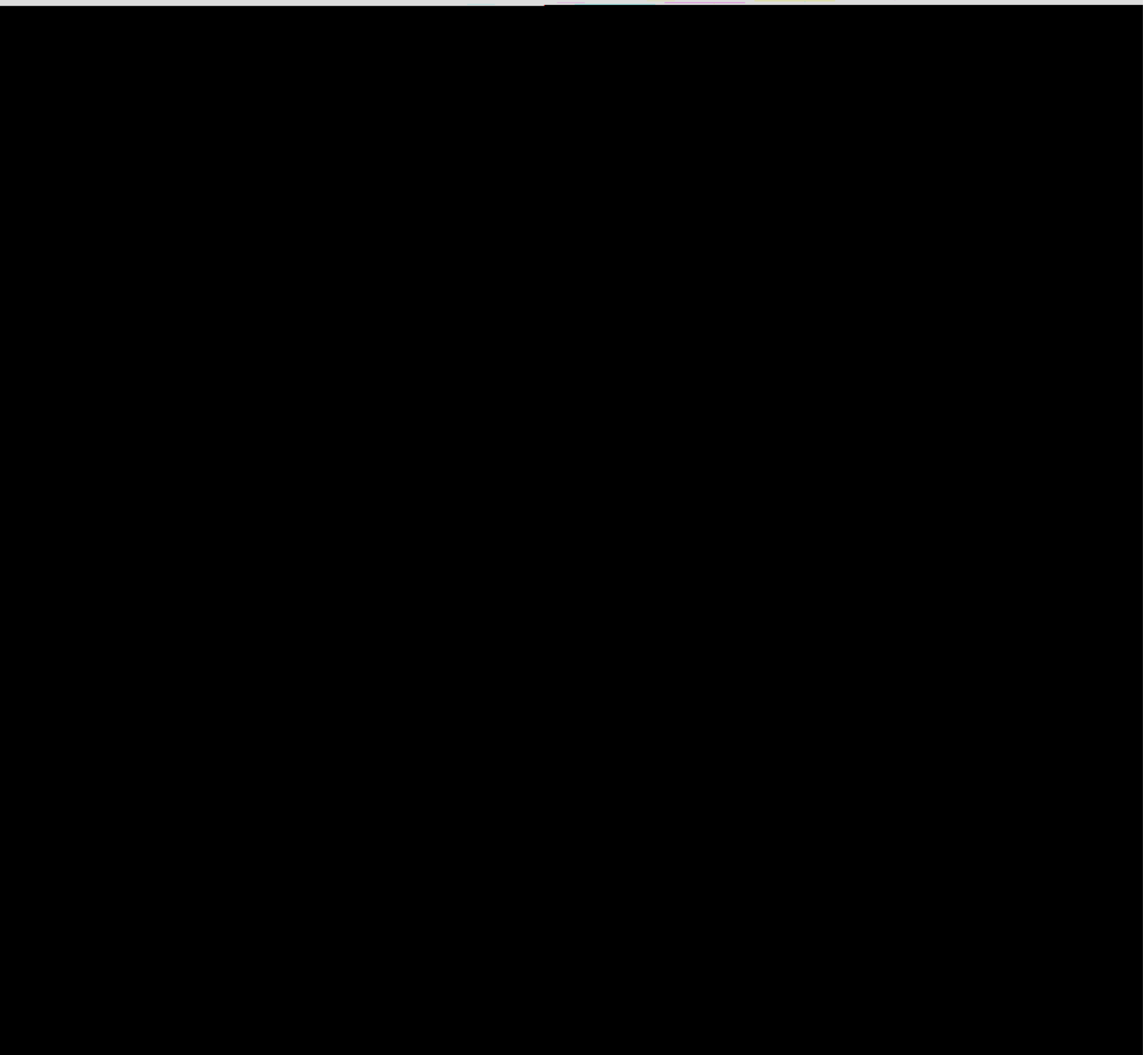
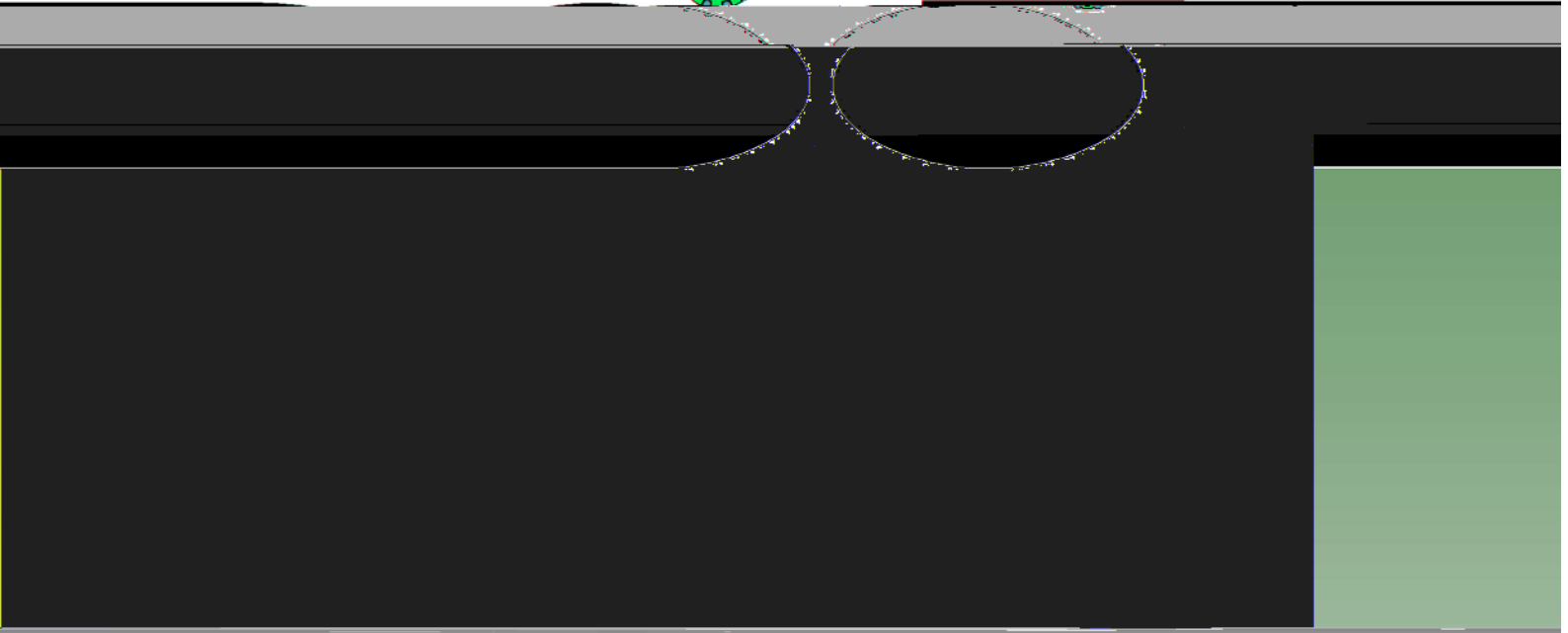
Jargon / Abbreviation	Explanation
SCOOT	Split Cycle Optimisation Offset Technique. Traffic signals can be managed through an advanced traffic control system called SCOOT. SCOOT controlled signals work in small area groups where timings adapt

Traffic Management and Control

Appendix 2 The Traffic Management Act 2004

Highways Agency Traffic Officers

- A2.1.1 HATOs are uniformed Traffic Officers will operate on the 'Strategic Road Network'. The Strategic Road Network comprises those roads managed by the Highways Agency (motorways and trunk roads –



Traffic Management and Control

Failure to Manage the Network

- A2.1.15 If an authority is failing with regard to its network management duties, the Secretary of State for England can intervene. While the Act includes two clauses outlining an authority's duty, there are 13 clauses stating what will happen if the authority fails.
- A2.1.16 The first stage would be a notice of intervention requiring the authority to explain what is happening and how it will improve. If the Secretary of State is still not satisfied, they can appoint a Traffic Director to monitor what is being done or actively intervene if necessary.
- A2.1.17 The criteria for this intervention are yet to be agreed and could be at least six months away.

Traffic Management and Control

- *Improving the environment, especially in the inner city.*
- *Improving access for industry and commercial premises, especially in the inner city.*
- *Producing a high economic rate of return.*
- *Ensuring the efficient operation and attractiveness of public transport services.*
- *Contributing to reduction in crime.*
- *Improving access for emergency vehicles.*
- *Reducing pollution levels."*

Other Material Considerations

Traffic Management and Control

Appendix 4 What Others Do Well

A4.1.1 An examination of the traffic management systems of a number of different local authorities found that the City Council is following best practice in a number of areas. Examples of where other authorities are operating different systems are as follows:

Transport for London (TfL)

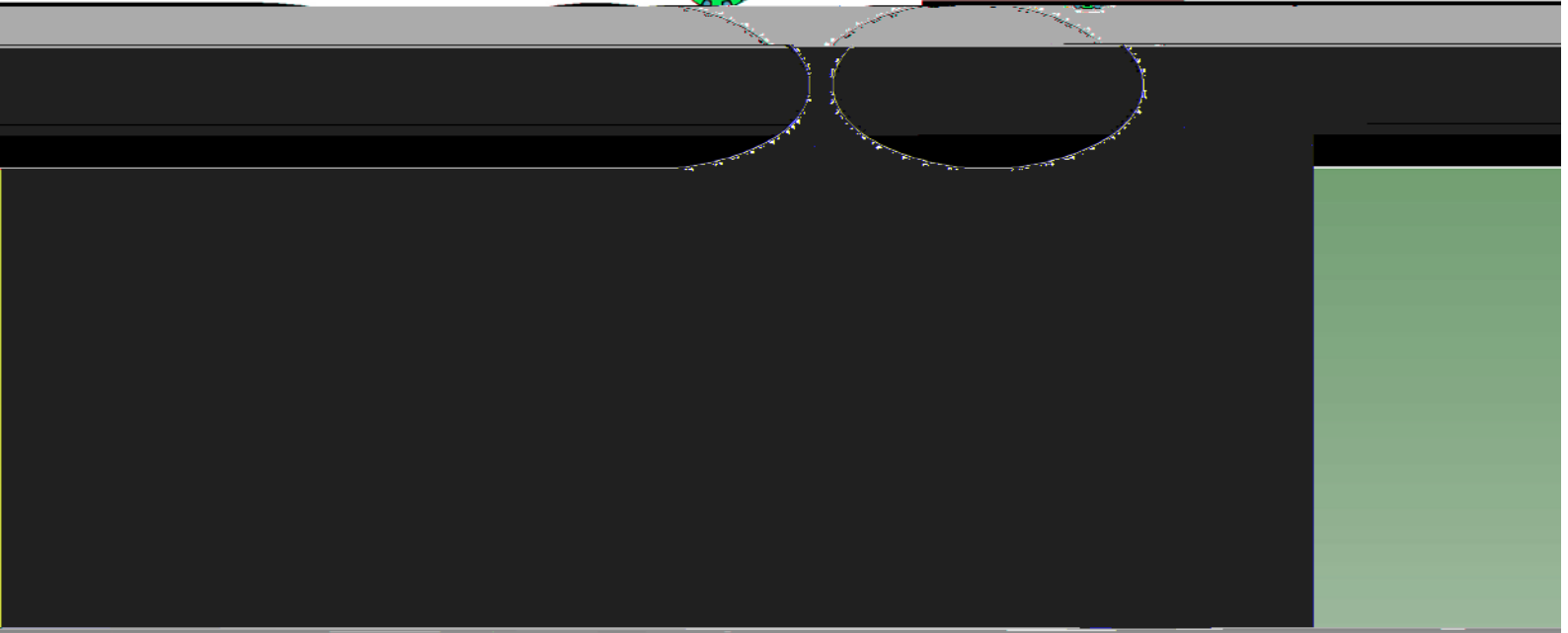
A4.1.2 Transport for London has introduced many active traffic management

Traffic Management and Control

introduction, congestion inside the zone has reduced by 30% and traffic levels have decreased by 18%.⁵

A4.1.6 There are a number of factors that have made congestion charging successful in London:

- The existence of extensive public transport infrastructure into the central area;
- The ability of Transport for London to control public transport in the capital in a way that regional Passenger Transport Authorities (PTAs) are unable to (with five times the subsidy);
- In London before the congestion charge was introduced, 90% of the journeys into the charge zone were made by public transport



Traffic Management and Control

- Emergency refuge areas every 500m for use in a breakdown. These are equipped with SOS telephones and monitored by CCTV;
- 128 fixed cameras;
- Road sensors every 100m (rather than 500m which is the usual distance) to measure traffic flow;
- Digital speed enforcement equipment;
- Rapid incident response teams to remove obstructions, assist with traffic management and repair roadside equipment;
- Controlled use of the hard shoulder as an additional running lane for incident management and during heavy periods of congestion;
- Emergency Refuge Areas, for use in case of breakdown, and

Traffic Management and Control

Appendix 5 CCTV Cameras

A5.1.1 The table below shows the location of the 17 CCTV cameras that the UTC operates and maintains throughout the city.

Camera	Location	Coverage
1	Lancaster Circus	A38M
2	Thornton Tower	Newtown