BARTLETT SCHOOL OF PLANNING

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PROJECT PROFILE

UK

M6 Toll Road

omega centre

Centre for Mega Projects in Transport and Development

A global Centre of Excellence in Future Urban Transport
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This report was compiled by the OMEGA Centre, University College London.

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Source: Arup Journal, 1/2005

A INTRODUCTION

Type of project

The M6 Toll Road is a 27-mile long dual three-lane motorway, for the passage of motor vehicles only. All vehicles are charged to travel along the road, and the charges vary according to vehicle type. The toll road is owned and operated by a private company, Midland Expressway Ltd, who are a subsidiary of the Macquarie Group.

The road was constructed primarily to act as a bypass of the M6 in the West Midlands conurbation, with the aim of alleviating the increasing congestion on the M6 sections through Birmingham and the Black Country.

The M6 Toll Road is 43km (27 miles) long. It has three lanes in each direction plus a hard shoulder. Its length includes sections at ground level, in cutting and on embankment. There are 41 road overbridges (of which 12 are access or accommodation bridges) and five road underbridges; with three rail overbridges and two rail underbridges. In addition to the connections at either end, there are seven junctions with other roads. There is also a service area.

Source: http://www.bbc.co.uk

Source: http://www.m6toll.co.uk

Location

The M6 Toll Road connects to the M6 at both ends. At the southeast end its final section is integral with the M42 (junctions 8a and 7/7a), connecting to the M6 at junctions 3a (west facing) and 4 (east/south facing). At the northwest end, near Cannock north of Wolverhampton, it connects (junction 8) to the M6 southbound (junction 11) and directly to the northbound M6 at junction 11A.

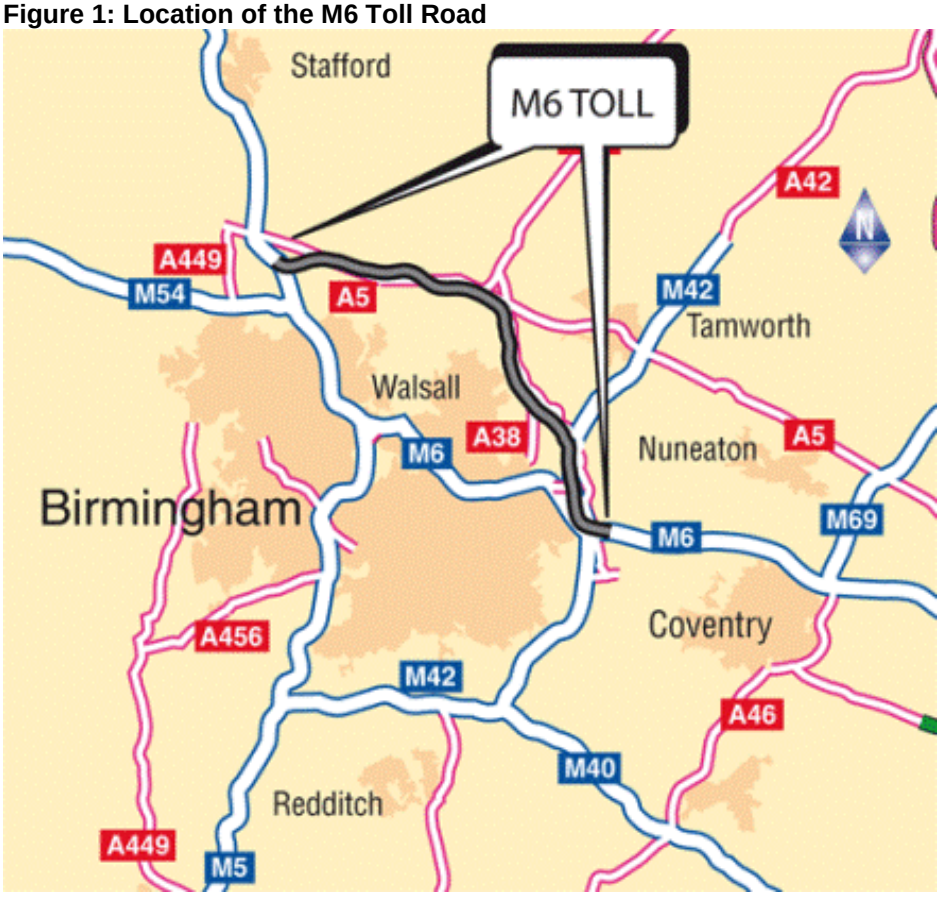
The M6 Toll offers a motorway link around the northern and eastern edge of the West Midlands conurbation, passing through areas north of the built-up parts of the conurbation. Much of this is open countryside. It also passes close to several smaller towns, including Sutton Coldfield, Burntwood and Cannock, and a few kilometres south of Tamworth and Lichfield in the Trent Valley.

The original M6 is routed through the northern part of the West Midlands conurbation, a significant part of this through built-up areas. This section includes a triangular junction with the M5 at Gravelly Hill (popularly know as 'spaghetti junction' from the complexity of the routings offered) and six other junctions with intermediate roads, including a short motorway link (A38M) into central Birmingham.

Current status

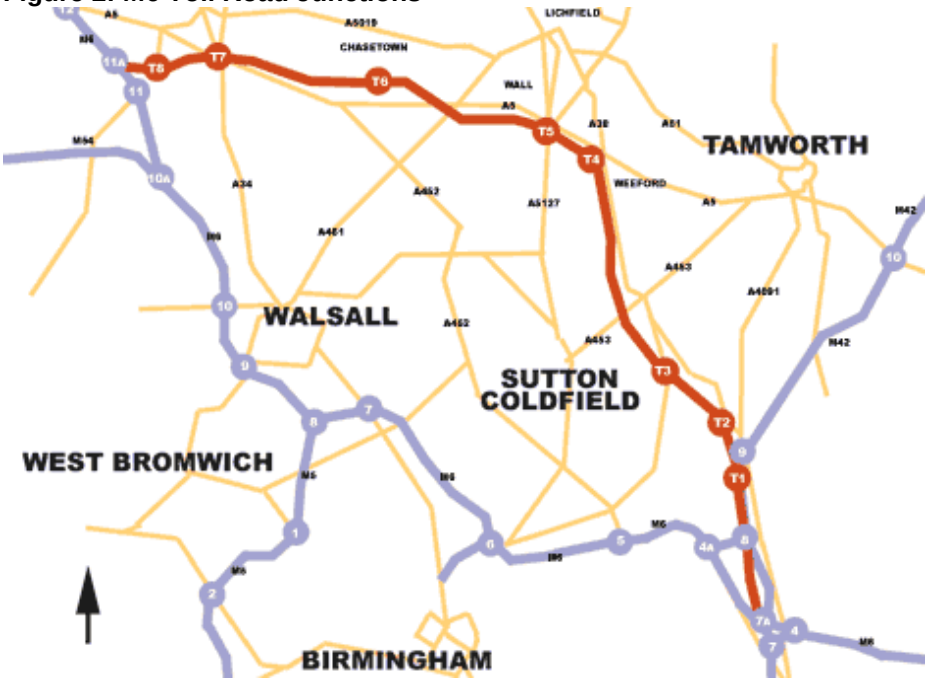
The M6 Toll Road opened in December 2003.

Figure 1: Location of the M6 Toll Road



Source: http://www.bbc.co.uk

Figure 2: M6 Toll Road Junctions

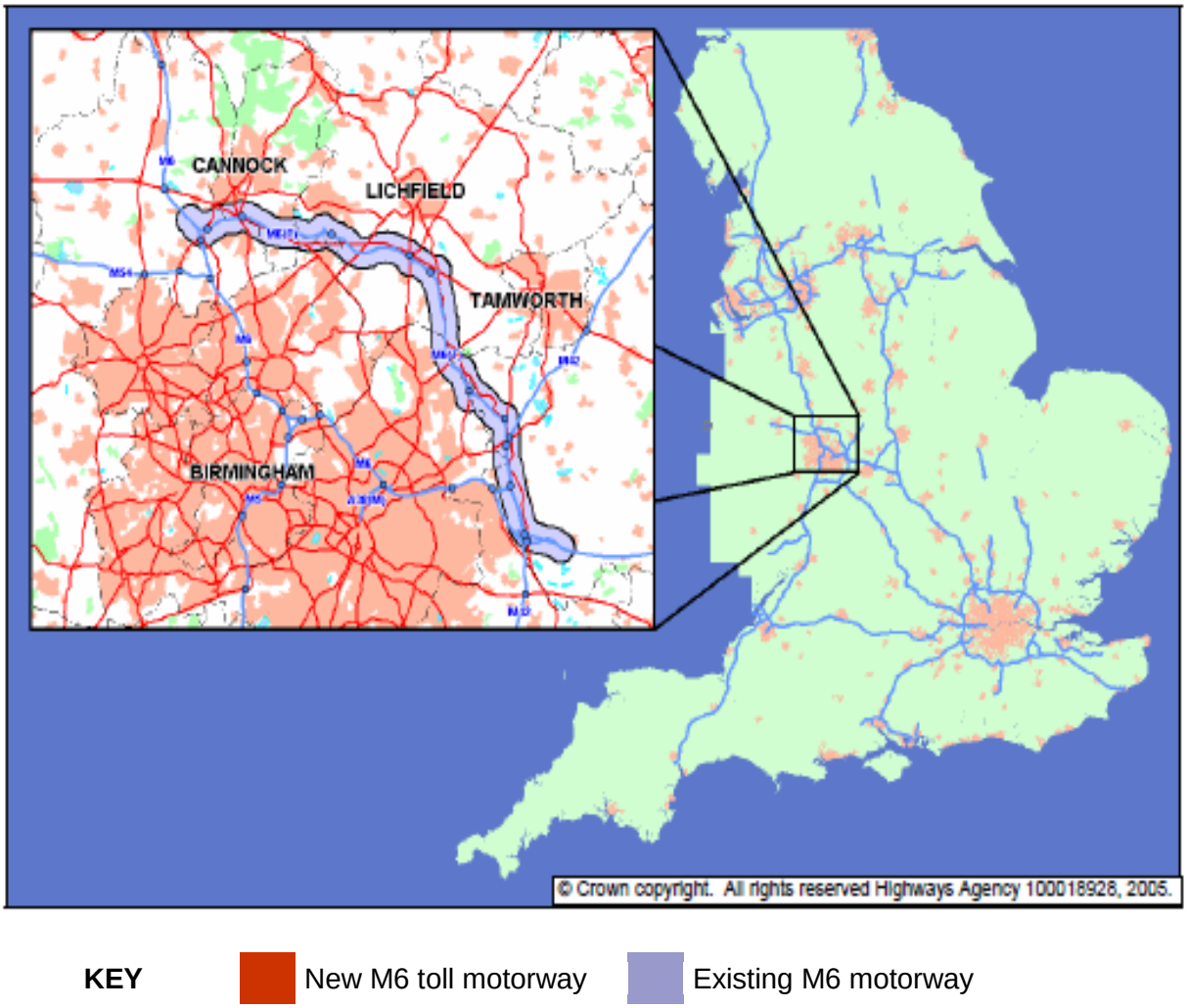


Source: http://www.bbc.co.uk

M6 Toll Road Toll Route

- **T1** (Kingsbury Road A4097)
- **T2** (Belfry – A446/A4091)
- **T3** (Langley Mill South– A38)
- **T4** (Weeford Junction – A5/A38)
- **T5** (Shenstone A5127)
- **T6** (Burntwood – A5 link)
- **T7** (Churchbridge A5/A34/A460)
- **T8** (Middle Hill – A460)
- **M6 Jn.11A** merge (M6 Toll/M6)
- **M42 Jn.8** merge and diverge (M42 south with M6 Toll south)

Figure 3: M6 Toll Road - regional and national setting



Source: Highways Agency (2005)

Source: Arup Journal 1/2005

B BACKGROUND TO PROJECT

Principal project objectives

The M6 Toll motorway was first conceived in the early 1980s when the Conservative Government identified the need for a scheme to relieve the heavily congested M6 through the West Midlands conurbation. From the opening of the M6 in 1972, traffic increased significantly and by the 1980s had peak flows of over 130,000 vehicles a day. Congestion and traffic delays are still common on the M6, with some sections of the motorway carrying up to 100% more traffic than the road is designed to carry - it is one of the most heavily used roads in Europe. Early suggestions to widen it were quickly dismissed as unrealistic, and after much debate and consultation, the decision was taken to build a new motorway north east of Birmingham. The Birmingham Northern Relief Road (BNRR) was originally conceived as a motorway link around the northern and eastern edge of the West Midlands conurbation offering an alternative to the busy M6.

BNRR was originally developed jointly with the proposed Western Orbital Road (WOR) to provide a new motorway link down the western side of the conurbation.

The BNRR had two principal aims:

- to provide a free flowing alternative to the heavily congested M6 motorway between Laney Green (junction 11) and Coleshill (junction 4), one of Britain's busiest stretches of motorway;

- to provide a distributor to the north and east of the West Midlands region, improving communications to conurbations such as Cannock, Lichfield and Tamworth.

Sources: Department of Transport (1994); ARUP JOURNAL (2005), p.47; Urban Transport Technology (2001).

The Department of Transport (1994b, p30) describes the objectives of the road at that time as:

- to provide an alternative route, for through traffic, to the very heavily congested sections of the M6 within the West Midlands conurbation;
- to provide relief to the existing road system north of the conurbation;
- to provide links for and distribute traffic better between the major roads to the north;
- to provide improved access for development identified in the structure and local plans.

Following a change in government policy towards private investment in new road schemes, bids were invited in 1989 for a privately funded scheme which would:

- provide relief to the M6 through the conurbation;
- provide a route as a distributor around the conurbation
- have regard to the latest traffic forecasts;
- provide as soon as possible the infrastructure to relieve congestion." (ibid, p31).

The proposed scheme would cater for strategic demand, be an attractive alternative in terms of service level and reliability compared to the present difficulties associated with M6, thereby increasing capacity and providing better distributive opportunities such that:

- the BNRR would provide a high quality, strategic route for through movements;
- the M6 would be relieved of through traffic;
- the M6 would in turn attract traffic from the surrounding urban road network thereby bringing relief to a greater area
- the proposed BNRR would act as a regional distributor to the various existing settlements and developments as well as for those proposed developments awaiting its arrival." (ibid, pp31-32).

The objective of providing a 'congestion free alternative' was also explicit at this time: "It is MEL's intention to maintain free flow conditions on the motorway through the use of the toll mechanism with a view to securing it as an attractive, high quality route." (ibid, p55). The BNRR "will offer a high standard route giving reliability, particularly for the longer distance traffic movements … reliability of service … an improved route for traffic in the strategic northwest/ southeast road corridor … a certainty of service which currently cannot be guaranteed. … In a time of financial constraint, the government is keen to harness the overall benefits which come from the involvement of the MEL and thereby bring forward other road proposals which otherwise could not be afforded."

Source: Department of Transport (1994b).

"In developing its proposals, MEL's main objective was to provide the level of service for which users would be most prepared to pay. Emphasis was placed on designing a road which would offer safe, reliable flow conditions, convenient access points, and ease of use. MEL was also conscious of growing concern about the environmental impact of motorways, and the close scrutiny that a privately funded scheme would attract. MEL considered from the outset that BNRR should aim to meet primarily the needs of long-distance and regional road users, with local users benefitting from the consequent relief to the surrounding road network.

Given its location on the urban fringe, it was considered important to minimise the number of intermediate junctions on the route, thus discouraging short distance use (junction-hopping) and promoting smooth flowing traffic conditions. However connections with other major trunk routes had to be maintained to enable the BNRR to function as a regional distributor." (Adams, 1994, p.116).

Mott Macdonald et al (2003) produced a report for Warwickshire, Staffordshire and Birmingham, to promote the business case for industrial development and investment along the M6 Toll corridor, noting industrial clusters identified by the regional development agency, local labour markets, house prices, etc.

"The M6 Toll has stimulated development of industrial land. It is estimated that, between 1 April 2002 and 31 March 2004, location within a five-minute drive time of an M6 Toll junction was associated with increased industrial land development of 3.01 hectares; and location within a ten-minute drive time was associated with increased industrial land development of 1.24 hectares. However, location within a 15-minute drive time of an M6 Toll junction had no such effect. Together, these results are consistent with the hypothesized locational benefits of the M6 Toll. They suggest development effects on sites that have easy access to the M6 Toll and that these effects diminish continuously with drive time."

"Qualitative data from interviews with development practitioners uniformly supported the primary finding that direct M6 Toll effects are significant on nearby sites but diminish rapidly with drive-time distance. In addition, the interviews yielded more limited support for the secondary finding

of 'indirect' development effects of the M6 Toll working further along the motorway network. The conclusion is that the M6 Toll is associated with a positive development effect in excess of benefits reflected in toll revenue. These are short-run effects that are likely to be smaller than the final, long-run effects of the M6 Toll."

"Unfortunately, theoretical reasoning does not uniquely predict the relationship between tolls and the development effects of new roads. However, the greater the likelihood of congestion on a new road, the more likely it is that tolls, via decongestion and reliability effects, will promote commercial use and development. Current and anticipated congestion on UK roads (Department of Transport, 2004, 2006) suggests that the development potential of new road infrastructure might be amplified rather than reduced by tolls."

Source: Pugh & Fairburn (2008)

Key enabling mechanisms and decision to proceed

Major new road proposals such as the M6 Toll Road are considered against the background of national, strategic and local planning policies - including White Papers, Planning Policy Guidance Notes/Planning Policy Statements, Circulars and Ministerial Statements.

Prior to construction, motorways in England require the publication of a Statutory Instrument that must be presented to parliament. Examples of Statutory Instruments for the M6 Toll Road (and its predecessor the BNRR) which cover matters such as routing and tolls include:

- Statutory Instrument 1998 No. 121: The Birmingham Northern Relief Road and Connecting Roads Scheme 1998 S.I. 1998/121
- Statutory Instrument 1998 No. 124: The Birmingham Northern Relief Road Toll Order 1998 S.I. 1998/124
- Statutory Instrument 2003 No. 2186: The M6 Toll (Collection of Tolls) Regulations 2003 S.I. 2003/2186
- Statutory Instrument 2003 No. 2187: The M6 Toll Wide Load Routes (Speed Limit) Regulations 2003 S.I. 2003/2187
- Statutory Instrument 2003 No. 2188: The M6 Toll (Speed Limit) Regulations 2003 S.I. 2003/2188

During the 1980s, the proposal for the Birmingham Northern Relief Road was developed as a publicly managed process, led by the (then) Department of Transport. This followed the long established approach to identifying and taking forward new road projects. Deciding on a preferred route was a lengthy process (six years) and two years of preliminary surveys were undertaken before local objections prompted a public inquiry in 1988.

The principal issue to emerge from the timeline is the 'watershed' around the roads policy documents published in 1989. The 'Roads to Prosperity' White Paper set out proposals for a major expansion in road building but also brought out the very substantial cost to the public budget and it was for this reason that the scope for bringing private funding into the equation was explored in the complementary Green Paper 'New Roads by New Means'.

The Inspector's report on the Public Inquiry coincided with this policy shift towards private finance, but was never published.

Following this, the decision was taken to implement the proposed BNRR through private capital as a Private Finance Initiative (PFI) scheme. It was the first scheme proposed in the UK for construction of a significant road by PFI (as distinct from bridges and estuarial crossings). It may have been considered a suitable 'test case' for PFI roads as there was a clear strategic need for the road and preliminary work on route options had already been completed. DoT (1994) noted on the tender for the concession in 1990 that, "No decision on the public sector scheme would be made until the competition had run its course" but later adds "the Department does not have any proposals to provide BNRR as an untolled road." The New Roads & Streetworks Act 1991 provided the statutory basis for tolling.

The (new) route developed by MEL involved significant changes to the alignment, in good part to avoid commitments to costs of replacing existing roads. This proposal also led to a public inquiry in 1994-95. After the public inquiry it took two years for the Secretary of State to announce that the scheme would go ahead and another two years for legal challenges to be cleared.

Main organisations involved

Central government

Project sponsors - Department of Transport and Highways Agency

Local authorities

The local authorities directly affected by the M6 Toll and their stance on the project (as noted by DoT in 1994) are shown in Table 1.

Table 1: Local authority positions on M6 Toll Road

Local Authority	Position
Staffordshire CC	In principle support for road but objected to proposed replacement public open space.
Warwickshire CC	In principle support for road but objected to tolling.
Birmingham City Council	In principle support for road.
Walsall Metropolitan Borough	Objected to proposed replacement public open space and wanted Western Bypass to be part of overall proposals.
South Staffordshire District Council	In principle support for road but objected to proposed replacement public open space.
North Warwickshire District Council	In principle support for road.
Lichfield District Council	In principle support for road.
Cannock Chase District Council	In principle support for road.

Two local authorities *not* directly affected by the M6 Toll but which provided 'in principle' support for the project at Public Inquiry were Dudley Metropolitan Borough Council and Lichfield District Council.

Source: Department of Transport (1994b)

Parish councils

Fourteen parish councils raised objections and formed the Inter-Parish Coalition against BNRR:

- two parish councils objected to the toll order;
- two objected to the entire BNRR project;
- other objections related to the relationship with the proposed western orbital route, motorway service areas and toll plazas, local side road issues and environmental issues.

Source: Department of Transport (1994b)

Community and pressure groups

Twelve local resident groups and action groups objected to the project - over 7,800 objections (including some 500 relating to the toll order) were received by mid-April 1994 (more than 60% of these were in the form of proformas, mostly canvassed by Friends of the Earth). Most objections were in relation to potential impacts on local areas and side roads, while some questioned the extent to which the project would bring relief to the M6 and suggested alternative alignments.

Local and national industrial and commercial bodies raised objections – the West Midlands Passenger Transport Authority (CENTRO) queried the impact on public transport facilities and Wolverhampton Chamber of Commerce objected to the potential impact on the local road network. Walsall Chamber of Commerce, the British Road Federation (BRF), Freight Transport Association (FTA) and Road Haulage Association (RHA) supported the project (although the latter expressed a preference for it to be a public rather than private sector scheme).

Approximately 1,700 members of the public objected in detail compared with just 35 letters of support for the project. While objections covered a variety of matters the principal concerns focused on: whether the BNRR could be justified; the likelihood that the project would encourage additional traffic; the need for more investment in public transport; loss of green belt, and environmental impacts (noise and air pollution, impact on wildlife and ecology, impact on recreational value of countryside). A total of 16 alternative route proposals and/or amendments to side road proposals were suggested by community and lobby groups.

Source: Department of Transport (1994b)

Friends of the Earth (FoE, 2003) describe the objection process/period as follows:

“There was only muted public opposition in 1988 because local people did not believe they could fight the proposals. However, when the toll road came forward there was a much more concerted campaign, reflecting the much higher national profile of road building and the damage new roads inflict upon our environment, economy and quality of life. An informal coalition, initially set up by West Midlands Friends of the Earth, became the Alliance Against the BNRR. It bought together environmental groups and residents along the whole length of the route. There were over 30 different organisations involved in the Alliance.

The Alliance successfully lobbied councils and MPs to oppose the route. It managed to persuade the Labour Party while in opposition to say 'it would not build the BNRR'. The official consultation process drew over 10,000 letters of objection and the resulting public inquiry was the longest ever undertaken into a road scheme in the UK. The Alliance co-ordinated evidence

against the BNRR at the Inquiry, at which a number of national and international transport specialists provided evidence along with parish councils, local authorities and campaign groups. Many individuals were able to have their say on this important issue and, due to the Alliance's co-ordination, were able to make their case.

The Alliance challenged the decision to build the road and the secrecy of the concession agreement in the courts. However MEL and the government were able to maintain the commercial confidentiality of key sections of the concession agreement so that eventually the costs to take the case further became too high for the campaigners.

However, during the court action the Government changed their policy to ensure all future concession agreements would be open to public scrutiny. Ironically, this did not apply to the BNNR/MEL concession.

At the same time road protesters set up a number of camps at Green Wood, Moneymore Hall, Boundary Cottage and Canwell Coppice to take direct action against the building of the road. The camps were in place for over a year between December 1997 and January 1999. Once all of the camps had been removed the Highways Agency let contractors destroy the local landscape and hand over the cleared route for construction of the road to commence."

Source: Friends of the Earth, 2003

The toll agreement was opposed by the National Alliance Against Tolls, founded in 2004. They criticised the scheme on the following grounds:

"They can charge whatever they like. The agreement between the Government and the company may include secret clauses, designed to encourage traffic to use the toll road. The Government were taken to court before the road opened, but the judges backed the Government's action in refusing to reveal the full agreement. Since then the Freedom of Information Act has taken effect, but so far the Government are still keeping most of the agreement a secret from the public."

Source: National Alliance Against Tolls, 2004

Midland Expressway Ltd

The main stakeholder for the project was Midland Expressway Limited (MEL), who hold the concession agreement (contract) for the road and have overall responsibility for its operation until 2054. MEL was initially owned 75% by Macquarie of Australia and 25% by Autostrada, the Italian state-owned motorway operator. It is now a fully owned subsidiary of Macquarie Bank of Australia.

MEL is a private consortium responsible for building and operating the toll road with a 53-year concession. The concession agreement provides for MEL to be responsible for the design, construction, financing, operation and maintenance of the M6 toll at their own cost and risk, without recourse to Government guarantees. The concession agreement that commenced on 26 January 2001 allowed MEL the exclusive rights to set tolls for the entire concession period. This makes MEL an attractive investment opportunity, with commentators suggesting that the M6 toll would constantly generate substantial revenues, given an appropriate level of tolls.

Sources: Highways Agency (2005), Zhang

It should be noted that in 2005 the House of Commons Transport Committee commented:

“Furthermore, we are concerned that the M6 Toll will be unaffected by national transport policy decisions over the next fifty years. Midland Expressway is able to operate the M6 Toll as an entirely independent stretch of road, providing safety and maintenance standards are met. The Government's policies, such as national road pricing, high occupancy vehicle lanes, and active traffic management, for example, can only be applied to the M6 Toll road with the co-operation of the operators. When we questioned Midland Expressway on their willingness to engage with wider Government policy, Sir Robin Biggam, Chairman of Macquarie European Infrastructure plc, explained that Macquarie would be prepared to discuss such requests, but this would require changes to the concession agreement: If there was a matter of national policy, if government wished to introduce it, I think we would enter into a discussion with the Government, as to what amendments might be required to the concession agreement.[181]

The Secretary of State acknowledged that to change the M6 Toll concession agreement according to new policy requirements would be expensive. The ability of the Government to control transport policy across the national road network must not be compromised. We are concerned that almost total control was handed to the private operator of the M6 Toll, Midland Expressway Limited. This is a risky strategy and there is no guarantee it will work in the public interest. If the Government decides to pursue further private toll roads, we would urge that the transfer of power and barriers to proper scrutiny, evident in the case of the M6 Toll road, are not repeated.”

Source: House of Commons, 2005

The 'Ecologist' (2000) notes:

“MEL published its plans and invited the public's views. More than 10,000 people objected to the scheme. After national and local organisations submitted their objections, a second enquiry opened in June 1994. With its closure in October 1995, it became the longest public inquiry into a road the UK had ever witnessed. At the time the 'No BNRR' campaign was backed by the Labour Party. John Prescott and various other senior Labour MPs said on numerous occasions that they would not build the BNRR if elected. Yet in July 1997 Labour announced that the road would be built and MEL, now with financial support, plans to begin construction in spring 2001, opening in 2004.”

Source: The Ecologist 2000

Consultants and contractors

In 2000, six years after the start of the Public Inquiry, all the legal challenges were cleared and MEL invited tenders from contractors. In the event, only two groups tendered: CAMBBA, and; Bouyges/Skanska. The winners were CAMBBA, a consortium of Carillion, McAlpine, Balfour Beatty and Amec.

Ove Arup and Partners, who were MEL's original design consultants, together with WS Atkins, became the design consultants to CAMBBA - as the Arup/Atkins Joint Venture (AAJV) (this did not cover the toll collection system and its hardware). Arup were appointed under a time-based design services agreement to carry out the detailed design of the entire project. As the project was funded privately it was imperative that the terms of the design and build contract were met especially the scheduling for the project. Interim milestones were set, attracting bonuses if

completed ahead of schedule, and fines of £170,000/day for failing to achieve the set milestones.

The design consultants' commission included a site-based team of around 30 people providing design support to the contractor during construction, and inspection of the works to ensure compliance with the design. The project included a challenging overall completion target of 173 weeks and several interim milestones were set, attracting bonuses if they were bettered and penalties if they were missed. The penalty for failing to achieve overall completion was approximately £170,000 per day. With such potentially large sums of money involved, the pressures on achieving the design and construction programmes were intense.

MEL appointed Babtie to look after their interests during the construction stage.

The Highways Agency retained the services of Owen Williams, who had been the original consultants to the public sector scheme.

During the Initiation of concept and appraisal phase, four workstreams were set up for the project strategy. Workstream one involved a four week design review, brainstorming, and a discipline-based value engineering workshop, involving people with significant experience on the project and new team members. Workstream two involved the gathering of additional pricing data particularly related to geotechnics and utilities. Workstream three involved further work to support the pricing of the baseline scheme. Workstream four was the culmination of the three workstreams together with the construction team.

Source: Arup Journal, 2005, p.49

The backbone of the organisation was four highway design teams, each handling a section of the motorway corresponding to the sectional division used by the contractor for construction. Atkins designed the two northern sections in its offices in Birmingham and Epsom, while Arup designed the two southern sections, working from its Midlands Campus office at Solihull. The four sections were respectively:

- 5.9km from the northernmost point (M6 Junction 11a) to M6 Toll Junction T7 at Bridgetown (Atkins);
- 11.9km from Bridgetown, Junction T7, to Shenstone, Junction T5 (Atkins);
- 15.3km from Shenstone, Junction T5, to M42 Junction 9 at Cudworth (Arup);
- 10.4km from M42 Junction 9 to the road's southernmost point, where it links with the M6 Junction 4 (Arup).

Discipline co-ordinators (including highways, drainage, geotechnics, structures, environment and building engineering) operated project-wide across the four teams, with a view to ensuring uniformity in both technical and presentation standards and, in most instances, providing design services in their particular disciplines. Although the whole Arup/Atkins Joint Venture (AAJV) team came from two firms, it is claimed that there was full integration.

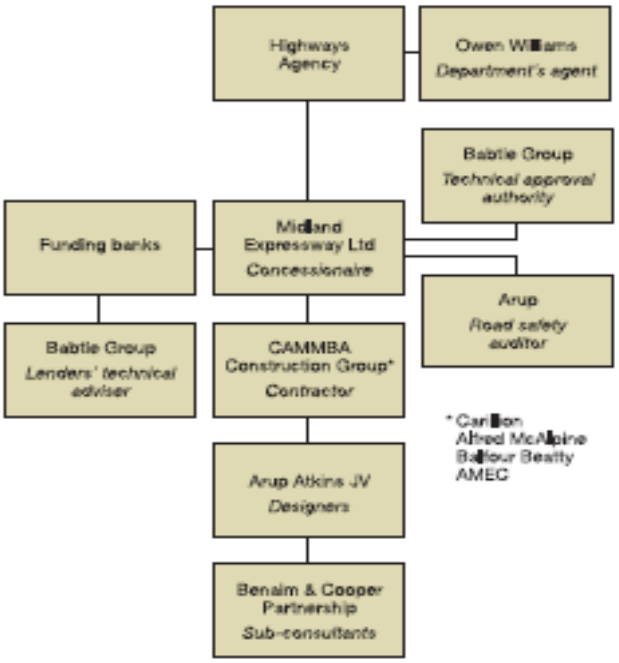
The contractor CAMBBA divided the site into four geographical sections for construction purposes. Each was staffed by a mixture of personnel from the four parent contractor companies, based in site offices within the individual sections. AAJV provided a team of usually six design and inspection staff to each of these section offices. CAMBBA senior management and staff, who had the remit for overall site responsibility, were based in a ‘core office’ on the project route at Shenstone, near Lichfield. AAJV reflected this arrangement and located its site

design management team, and specialists for buildings, environmental works, and motorway communications, at the core office. At its peak, AAJV's overall site team was 40-strong. The concessionaire, its technical advisors, and the Highways Agency's technical advisors were also based in offices at Shenstone. AAJV had two distinct roles on site: firstly, to provide technical advice and support to CAMBBA, and secondly, to monitor the quality of the works to ensure that they were constructed in accordance with the design.

The technical support role consisted primarily of responding to technical queries and processing design changes. These - required for example to suit changed circumstances, resolve construction problems, or resulting from value engineering - were reviewed by the concessionaire's technical advisors in a similar way to the primary design. Arup's Integration tool enabled instant access to all drawings and other documents from desktop computers in all offices throughout the site.

Sources: Arup Journal (2005), p.50; The Motorway Archive; Urban Transport Technology (2001).

Figure 4: Project Organisation



Source: Arup Journal 1/2005

Disputes

Disputes between MEL and CAMBBA continued for several years after construction:

"Disputes with the Contractor

MEL entered into a construction contract with a joint venture of major UK Contractors, CAMBBA. A three-year defect liability period remains in existence, expiring on 8 December

2006, at which time a retention bond is to be released. The final cost of the design and construction contract has not yet been agreed with CAMBBA as a number of issues are under dispute. These matters have been referred through adjudication – full and final decisions are not expected until 2007.

Mitigation claim

In January 2004, CAMBBA advised MEL of its intention to submit a claim for the cost of mitigating delays to the contract caused by requested changes (delay events). The claim was submitted on 30 November 2004 in the sum of £56m. No substantiation of this figure has been provided. By October 2005, MEL's assessment of the claim had found no evidence of claimed mitigating actions in respect of changes. MEL then referred the matter to adjudication.

The Highways Department Agent has not yet assessed those parts of the claim that are ultimately the Highways Agency's responsibility to pay under the Concession Agreement. The Department's claim liability is currently unknown as CAMBBA will not say how the mitigation claim is apportioned. The adjudicator's decision has not yet been received. The fact that CAMBBA has asked for permission to withdraw the claim and agreed that the adjudicator can decide "that it currently fails in its entirety" makes it unlikely that the claim will succeed."

Source: MEL (2005)

"Claim Update

During the last six months good progress has been made towards resolving the claim lodged by CAMBBA against MEL and the Secretary of State (SoS). It is expected that the final account will be signed within the next three months.

MEL will, as part of the agreement, take over responsibility for completing certain works for example at Langley Mill Embankment. This section of motorway embankment has had to be re-leveled several times by CAMBBA because of gradual settlement which was a result of inadequate compaction. It is expected that one subsequent and final re-leveling will be needed within the next five years at an estimated cost of £25,000.

CAMBBA has finalised most of the disputed defects and agreements are being reached for those that remain outstanding.

MEL is now responsible for the landscape maintenance, which will be outsourced owing to the specialist nature of the works. Detailed negotiations are currently underway with several contractors to ensure best value."

Source: MEL (2006)

http://www.phigroup.co.uk/files/phigroup/M6%20Toll.jpg

http://www.lhcrt.org.uk/photos/events/agm/aqueduct1.jpg

Planning and environmental regime

Background

As noted above ('Key enabling mechanisms and decision to proceed'), much of the planning and environmental regime for 'strategic' projects such as the M6 Toll Road is determined at central government level - see Figure 5 below and Project Timeline (Section D). This process allows for Public Inquiries to hear objections 'in principle' and on matters of design, routing etc.

Source: DfT website - http://www.dft.gov.uk

Planning Policy Guidance Note PPG10 (Strategic Guidance for the West Midlands): ".....recognises the positive role that the BNRR would have in contributing to the economic prosperity of the West Midlands. This would be achieved by relieving traffic congestion in the M6 corridor and facilitating key economic development proposals." (para 10.4).

Staffordshire, Warwickshire and Birmingham strategic planning frameworks all safeguarded the route of the M6 Toll road and ".....acknowledge the potential to stimulate economic development". Local plans prepared by directly affected local authorities also sought to safeguard the route and included policies which aimed to mitigate possible adverse effects".

Source: Department of Transport (1994b)

Timeline of planning process (see also Section D)

- September 1987 - Draft Line Orders for the original BNRR were published, followed by an eight week public consultation period. In light of objections received a Public Inquiry was held. Following the Inspector's Report on the Public Inquiry the Orders were withdrawn;

- May 1989 – the Government publishes a White Paper, 'Roads to Prosperity', setting out a major road building programme and follows this up with a Green Paper 'New Roads by New Means' which establishes private financing as the preferred funding method;

- July 1989 - Secretary of State announces that the road will be built and will be privately financed;

- August 1991 - MEL is provisionally awarded the concession for the project;

- October 1991 – the New Roads and Street Works Act comes into force enabling privately financed toll roads and bridges under the 1980 Highways Act;

- February 1992 - MEL prepared a revised scheme;

- March 1992 - the route is published, incorporating amendments made during the design and environmental assessment process;

- June 1993 - draft proposals for the project are published together with the Environmental Statement and Concession Statement. The objection period ends in September 1993;

- June 1994 – a second Public Inquiry is held (this ends in October 1995);

- July 1997 – the Secretary of State recommends the M6 Toll Road as proposed by MEL should proceed (there are legal challenges to this but these are quashed in 1999).

In addition to the above, planning applications for ancillary works such as motorway service areas and maintenance areas were required to be submitted by MEL to the relevant local authorities.

GVA Grimley provided the planning advice for the road. "Working with the Highways Agency and Midlands Expressway Limited, GVA Grimley helped promote the scheme, working closely with local authorities and action groups to ensure their views and concerns were taken into account and systematically and fairly considered in the scheme's development."

Source: Hollowood, 2004

Environmental aims and actions

The assessment of environmental effects and proposed mitigation measures was carried out and published prior to the Public Inquiries. These Environmental Statements sought to demonstrate how the proposed alignment would minimise adverse effects by (for example) avoiding sensitive areas, and adopting design principles that take account of potentially damaging effects on landscape value, visual impact and noise. Mitigation measures included earth mounding, shaping and contouring to reduce noise and/or visual effects and tree planting. Measures were also proposed to prevent pollution of watercourses and supplies, wildlife protection and the minimisation of disruption during construction.

Since the proposed route largely passes between (rather than through) existing settlements, community impacts were believed to be minimal. However, the proposals did involve the relocation/reconfiguring of community recreation facilities at Hatherton Reservoir, part of Chasewater and Jubilee Park playing fields at Hammerwich. Several private recreation facilities were affected – Chasewater Light Railway, Go kart track at Chasewater, Wharf Lane riding stables, Motorcross facility at Wharf Lane, part of Old Salteians rugby club.

The project was seen to help reduce 'rat running' through towns and villages by relieving existing congested routes and by diverting traffic off less suitable urban roads. Increases in traffic flows were expected in some areas but "the imposition of severance is not considered to be a major issue, taking account of the relatively low volumes of traffic at these locations".

Two SSSI areas were affected, plus Hatherton Reservoir and the site of locally rare plant species – mitigation measures included the creation of new habitats, providing fencing and wildlife tunnels.

Source: Department of Transport (1994b)

In part because of the pressure from the environmental groups, MEL stressed the extent to which it sought to mitigate environmental disbenefits from the construction. The project attracted an extensive debate on the environmental dangers of such a construction. To reduce the criticism and minimise the effects of its operation on the natural environment, CAMBBA Construction Group had decided to use environmentally-friendly routes, anti-noise road building material and also to plant approximately a million trees across the route.

Source: Urban Transport Technology

“MEL believes in sustainable development of its business. During construction of the motorway more than 1 million trees and shrubs were planted, environmental ponds were built, rare heathland was translocated and ancient hedges were moved. Noise mounds and noise fencing were used in combination with quiet road surfacing to minimise the environmental impact of the new road. MEL also sponsored the Green Arc Partnership, which was formed to work on enhancing the rural/urban fringe affected by the building of the M6 Toll.”

Source: www.m6toll.co.uk

“The motorway's design aims to minimise any impact on the local landscape and the lives of the neighbouring population both during and after construction, and wherever possible the new highway has been designed in cuttings, while at-grade or embankment areas are screened with extensive landscaped mounding to reduce noise and visual impact. Additional land has been provided alongside that needed for the engineering works to allow for additional landscaping.”

Source: World Highways 2002

Many measures were taken to mitigate the effects of the route on the local environment. Ecologists, a landscape architect, and environmental scientists were all involved at each stage of the scheme.

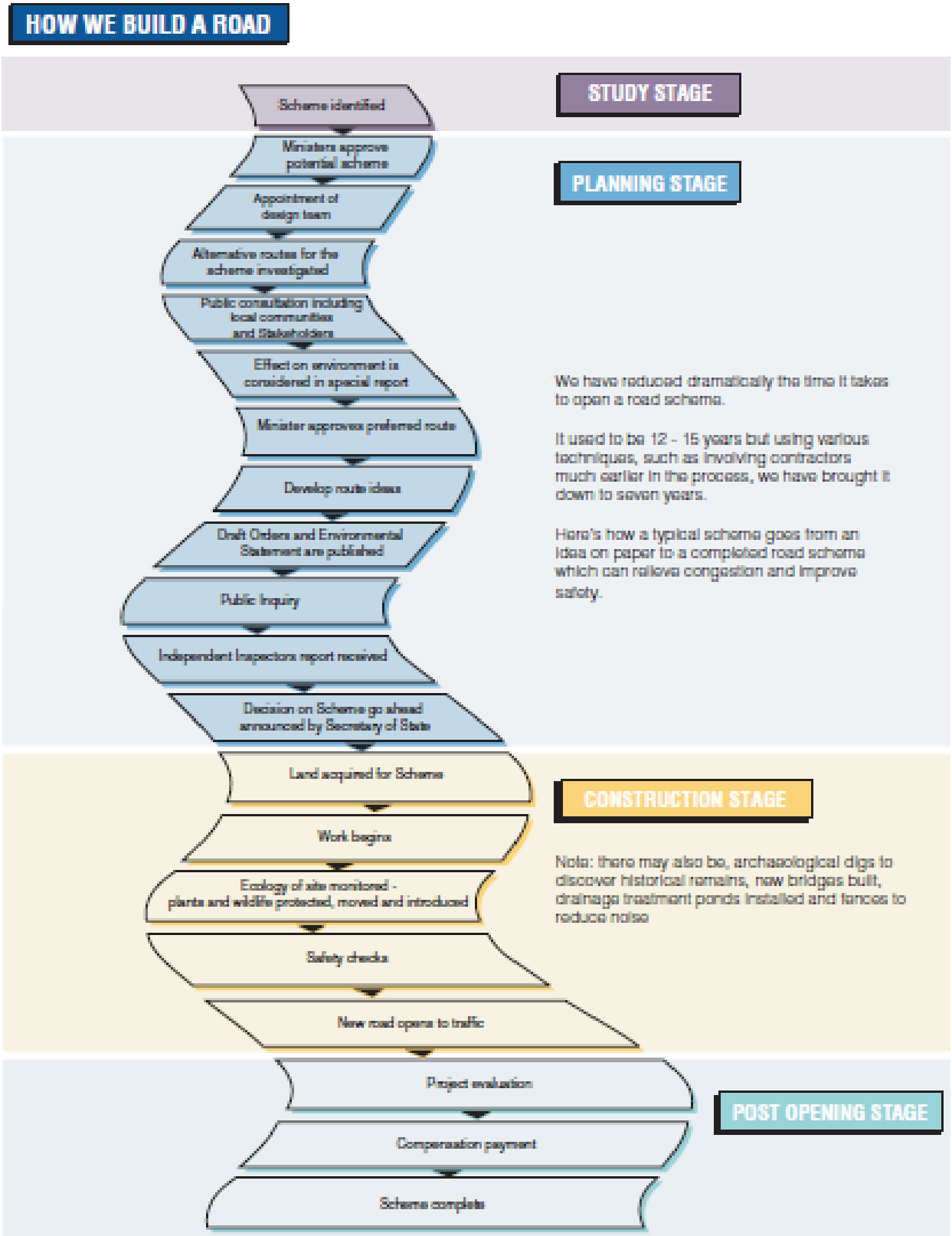
From the outset of construction, ecologists managed the clearance of site vegetation and helped in relocating significant flora and fauna. About 2ha of wet heathland was translocated to a carefully prepared receptor site - a double-lined lagoon, 1.5m deep, and backfilled with carefully stratified selected materials. This created a soil profile to match the donor site. Specially designed machinery was introduced to allow giant 2.4m x 1.2m x 0.3m turves to be lifted and laid, accessing the site on temporary floating sleeper roads. Approximately 1ha of dry heathland was created through a combination of techniques, including prior harvesting of seed from a Site of Special Scientific Interest (SSSI) through which the motorway was being constructed. Heather turves and peaty topsoil were also recycled separately from this SSSI and respread on the motorway verge prior to seeding with the harvested seed. Elsewhere, heather brash harvested during management operations from a nearby country park was used to create new heathland on screening bunds.

A wide variety of wild fauna living on or frequenting the site, including white-clawed crayfish, newts, water voles, badgers, otters, bats, and Fallow and Muntjac deer, was relocated or otherwise protected as part of the works. Most of the roadway is fenced against various combinations of badger, otter, deer, and newts, and over 60 mammal passes and ledges have been provided in addition to road and pedestrian crossings, enabling animals to cross the motorway safely. Four otter holts, two badger setts, and hundreds of bat boxes were provided, along with numerous log piles for animal habitats.

It was imperative to maintain the rural landscape and feel of the region through which the route passed, and major shrubbery planting took place on and off the line of the motorway to help conceal and blend the scheme within the surrounding landscape. Approximately a million trees and shrubs were planted over two winters during the course of the works. Almost 130 offsite plots were planted through agreement with landowners. In addition, ornamental planting around toll plazas includes herbaceous flower and ground cover beds in an effort to introduce human scale and create a more convivial workplace environment for the toll station workers.

Source: The Motorway Archive

Figure 5: Current planning process (Highways Agency)



Source: http://www.highways.gov.uk/roads/12716.aspx - accessed August 2009

Drainage

As a separate entity to the drainage system, 20 ponds were created. This was primarily for ecological purposes, though the largest is intended to be used as a commercial fishing lake. They have common features to increase ecological value; translocated and imported aquatic plants were used and several of these ponds were perched and required lining. In addition, eleven existing ponds were retained and modified to maintain ecological and amenity value.

Watercourses totalling 9.5km were diverted, incorporating meanders, riffle weirs, fluctuating bank gradient, depth and width, sandbanks, aquatic planting. A wide variety of erosion control methods were built in, including gabions, riprap, geotextiles, car rolls, live woven willow, and translocated rushes, in addition to in situ concrete. At the motorway drainage outfalls, a total of 28 balancing ponds were built to limit or attenuate the discharge to adjacent watercourses. Each pond combines with an oil inceptor to provide pollution control. Two-thirds of the ponds include further ecological mitigation features such as islands, static water areas separated from the main part of the pond, reed beds, and marginal/marsh planting shelves at various levels relative to normal water level, gravel beaches, and hibernacula (part-buried riprap hibernation areas). Where necessary, drainage channels were lined to protect aquifers.

Upstream of the ponds, the M6 Toll drainage combines kerbs, gullies and hollow kerbs; combined surface water and groundwater drains (filter drains); the longitudinal drainage channel (In the central reserve); and ditches.

The drainage is a gravity system, except for the outfall from the Shenstone cutting, west of Tamworth and south of Lichfield. Here, as it passes under the Sutton Coldfield to Lichfield railway, the M6 Toll Road is forced into a low point below the level of the nearest watercourse, Crane Brook, 500m south, and thus requires a pumped outfall. The gravity network outfalls into a wet well comprising a 12m diameter, 12m deep chamber formed of precast segmental concrete rings. Upstream of the wet well, only limited attenuation was possible and so to accommodate a 1:50-year storm, the well contains four pumps, each with a capacity of over 1,100 litres/sec. Water is pumped to a header tank at the top of an adjacent earth mound, from where it flows down a 1350mm diameter gravity main to an attenuation pond prior to discharge into Crane Brook.

Source: The Motorway Archive

Land acquisition

Compulsory Purchase Orders (see Section D) provided for the acquisition of over 600ha of land and rights (land to be acquired ‘in exchange’, alterations to side roads, creation of new side roads, diversion of watercourses and other drainage works, landscaping to mitigate visual effects and reduce road traffic noise to properties and for other environmental reasons). Land was required for: carriageways, cuttings, embankments, junctions, drainage ditches and tolling facilities; motorway service area and three maintenance areas (as specified in the concession agreement); 120ha for environmental mitigation works and landscaping; 55ha for rights of access, including temporary works. Categories of land taken were:

- 430ha of agricultural land - including 4ha Grade 1 land, 100ha Grade 2 land, 160ha Grade 3a land, 120ha Grade 3b land, 40ha land in other/miscellaneous use;

- 170ha of existing highway land and land in other uses;

- Three areas of public open space (13ha in total) were affected – Hatherton, Chasewater and Hammerwich – these 'exchange lands' replaced “on an equally advantageous basis” with 16ha of similar land nearby (pp51-2).

Source: Department of Transport (1994b)

“After the longest Public Inquiry for a road scheme ever, the BNRR was eventually given the go ahead in July 1997. At the time of the Inquiry 10,000 people had sent in letters of objection to the motorway, one of the highest local protests to a road ever achieved. Local residents are overwhelmingly opposed to BNRR. Compulsory Purchase Orders have been served, subject to the legal case, which would allow Midland Expressway to take people's homes and land.”

Source: Friends of the Earth, 1999

“Forty-one homes were knocked down during the construction of the M6 Toll Road, the majority of which were on Hednesford Road, Brownhills West. During the construction process many people have been affected by noise, dust, and large vehicles using inappropriate roads. Construction continued during the foot and mouth outbreak despite concerns from local farmers about the effects of vehicles and workers crossing fields and country lanes. There have been numerous complaints from local people about the behaviour of construction workers and their insensitivity to people's concerns. The response of MEL and national politicians to these concerns has been poor. In some places landscaping and tree planting schemes have not been completed or earth mounds and fences have not been installed.”

Source: ASLEF, 2005

Central government concerns

The Government’s Response to the Transport Select Committee’s Report, 'Road Pricing: The Next Steps’ (HMSO, July 2005) raises a number of key policy concerns, as follows:

"18. The ability of the Government to control transport policy across the national road network must not be compromised. We are concerned that almost total control was handed to the private operator of the M6 Toll, Midland Expressway Limited. This is a risky strategy and there is no guarantee it will work in the public interest. If the Government decides to pursue further private toll roads, we would urge that the transfer of power and barriers to proper scrutiny, evident in the case of the M6 Toll Road, are not repeated. (Paragraph 96)

The M6 Toll concession agreement was signed in February 1992. The agreement is over ten years old and was an early attempt to use private finance for roads. Were further tolled roads to be constructed, the Government would want to consider carefully how best to structure the contractual arrangements with any concessionaire. There is a balance to be struck between maintaining controls over toll levels and the commercial viability of a toll road scheme and the extent of risk transfer to the private sector. This balance would need to be considered in the circumstances of any particular project."

C. PRINCIPAL PROJECT CHARACTERISTICS

Route description

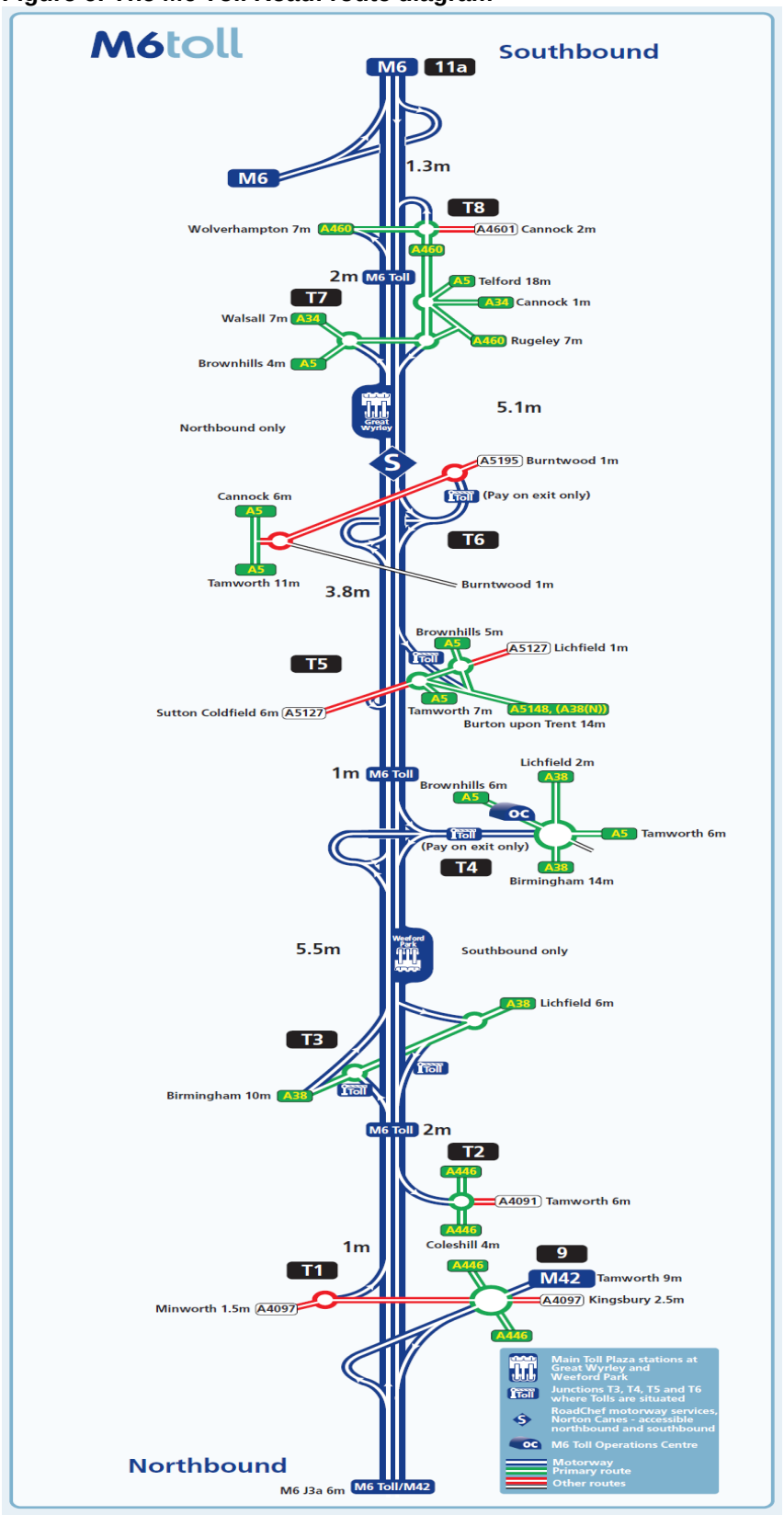
The M6 Toll Road runs between junction 3a of the M6 at the south end and junction 11a of the M6 at the north end. Approaching the M6 Toll Road from the south, it is possible to join it at either junction 3a of the M6 or directly from the M42 just prior to junction 9. It is also possible to access and exit the M6 Toll Road at various points along the route. There are eight entry / exit junctions in all and six toll stations.

The route the M6 Toll Road follows is that of the existing road corridors of the A5, A38 and A446.

Junctions with other roads

The M6 Toll Road has seven junctions with other roads, in addition to its links at either end with the M6. These are set out in Figure 6.

Figure 6: The M6 Toll Road: route diagram



Source:www.m6toll.co.uk/

Project costs

Total project cost

MEL was awarded a 53 year concession to run the M6 Toll Road until 2054. The privately financed M6 Toll Road cost £485m to build and Macquarie Infrastructure Group put the total project cost at £900m. The Select Committee on Transport Seventh Report (March 2005) notes that:

> "The M6 Toll is a premium quality road that was delivered on budget and ahead of schedule, with minimum use of taxpayer's funds. The total investment outlay to develop, design and build the M6 Toll was approximately £900m, with the only cost to the government being an £18m contribution towards rebuilding part of the connecting M42. The entire development cost (and risk) was transferred to the private sector."

Source: www.parliament.uk Select Committee on Transport Seventh Report, March 2005

Similarly, MEL notes that:

- "MEL invested £900m in the design and building of the M6 Toll Motorway, which opened to traffic in December 2003, on budget and six weeks ahead of schedule …. The privately financed £900m investment in the M6 Toll, is made up of both equity and investment grade debt in a structure to suit both the size of the investment and the long-term nature of the concession, which runs until 2054."

Source: http://www.m6toll.co.uk/faqs/default.asp?mainmenuid=6

- "£685m of private debt was raised to assist in financing the construction, with the rest being put as equity by the owners of MEL

- Originally jointly owned by Macquarie Infrastructure Group (MIG) of Australia (75% ownership) and Autostrade SpA of Italy (25% ownership) but options existed to allow MIG moving to 100%"

Source:http://www.m6toll.co.uk/UserFiles/File/Public%20Sector%20Review%20Article%20June%202006.pdf

Previous cost estimates for the project were:

- 1994 - £270m (Newbery, p251);
- 1999 - £300m (ICE, 1999: The Private Finance Initiative: An Introduction. http://www.ukmotorwayarchive.org/)

Cost and risk - commentary

Newbery (1994, p251) notes “The cost of engineering will be some £270m, including substantial sums for mitigating the environmental impact. … The cost per lane km is thus £0.9m, somewhat higher than recent motorway projects, but about half the cost of widening the M25. The proposed initial toll is £1.50 for cars, equivalent to 3p/km for those using the entire length. If maintenance is taken as 0.5p/km, MEL could generate 10% real return (including amortisation

over 50 years) at an AADT from cars alone of 60,000. As heavy vehicles are charged more (but incur higher road damage costs), provided they contribute the same surplus over running costs, this figure should be conservative. For comparison, dual three-lane sections of the M25 carry over 100,000 AADT, so the BNRR will break even at a low load factor."

Mackie & Smith (2005, pp220-221) argue that "if for some reason, the wrong risks are transferred to the private consortium, cost will be increased. For example, in the case of the Birmingham Northern Relief Road (M6 Toll) much of the planning risk was transferred to the consortium. These were risks which the consortium was ill-placed to manage, which caused huge delays, and which nearly led to the project becoming unfinanceable. Again, there are arguments that transferring traffic risk is inappropriate. If traffic volumes depend primarily on economic growth, fuel prices and other macro variables, most of the risk is not amenable to management by an individual private consortium. Inevitably, they will require a risk premium to compensate them for taking on an unmanageable risk."

It should be noted that 'planning risk' here most probably refers to the cost and delay caused by Public Inquiry – this no doubt contributed to the gap between the overall £900m project cost and the £485.5m construction contract. Wellings & Lipson (2008) argue that "the discrepancy in part reflected high financing costs at the start of the project related to the political risk that final permission to build the road would not be granted, as well as risk associated with the untested nature of such a project in the UK."

Wellings & Lipson (2008) suggest the costs of the scheme were inflated by uncertainties over revenue: "The revenue risk problem is well illustrated by the development of the M6 Toll (known in the planning and construction phase as the Birmingham Northern Relief Road). Such uncertainties meant that the cost of the scheme was inflated by high financing costs, while traffic projections – and revenue forecasts – were overly optimistic. In the absence of wider pricing the M6 Toll suffered from 'unfair' competition from the existing M6. In particular, except during severe congestion, speed-limited hauliers had little to gain by using the toll route. At the same time, M6 Toll users effectively paid twice when fuel duty and vehicle excise tax are included. If a national road pricing system had been in place motorists on the original M6 would also have had to pay a toll and, potentially, motoring taxes might have been reduced or abolished. The 'unfair' competition currently observed would have been eliminated."

Project programme

- Contract date - September 2000
- Contract period - 40 months (contractual obligation)
- Contract completion - January 2004 (six weeks ahead of schedule)

Source: http://www.m6toll.co.uk/about/project.asp? - accessed September 2009

"The project included a challenging overall completion target of 173 weeks and several interim milestones were set, attracting bonuses if they were bettered and penalties if they were missed. The penalty for failing to achieve overall completion being approximately £170,000 per day."

Source: The Motorway Archive, On-Line Resource

Note: it has not been possible to identify the expected project programme at the time the decision to proceed was taken.

Main engineering features

Structures

The contract includes 57 new bridges, seven interchanges and six toll stations. The new bridges constructed included overbridges, underbridges, footbridges, rail bridges and linkbridges. Of the 20 existing bridges, four were demolished, eight widened and eight structurally changed. The total amount of earth excavated totalled some 9.2 million cubic metres. The extremely tight construction programme called for the first 19 steel overbridges and six concrete underbridges to be fully designed and issued for construction within the first eight months of the programme. The design objective was to provide aesthetically pleasing, open structures that were simple to build and replicate, thus achieving significant resource savings from the development of the tender design. The aim was to ensure that the structures would be constructed without impacting on other activities.

The overbridges therefore followed the following build principles:

- twin main beam, two-span steel composite (or ladder beam) decks;
- open-bank seat supports above artificially strengthened sideslopes in reinforced earth;
- common elements such as piers and return wingwalls standardized;
- skew taken out at the deck ends to simplify fabrication and connection detailing.

The structures programme also involved modifying some existing bridges, and during widening of the M42 to accommodate the new toll route, five existing underbridges were extended by approximately 30m. Existing structures required a full structural assessment in addition to the new design, and so needed considerably more resource effort than brand-new bridges. Key to design was the ability to ensure consistency and compatibility between the old and new.

Highways

Generally, the route follows existing major road corridors, thus minimising the effects on the wider landscape, and with alignments carefully developed to optimise the cut-and-fill requirements. Whilst much of the route was in cutting or on shallow embankments, the creation of mounds and false cuttings helped blend the road into the countryside. During the detailed design, the alignments were optimised further to win more locally occurring aggregates, which were used in the pavement and concrete structures.

The junction layouts at each end of the scheme were complicated by the concession agreement which made the M6 Toll the 'through route', so that traffic wishing to continue along the M6 had to exit the M6 Toll to rejoin the M6. This requirement both complicated the junction layouts and influenced the performance of the interchanges.

At the southern end, a major interchange between the M6 Toll, the M42 and the M6 extends over approximately 8km. This complex section was heavily constrained by existing motorway links, local roads, and structures that had to be retained, as well as rivers and railways, and the proximity of residential properties. To alleviate these constraints, the preferred design included a combination of parallel construction, asymmetrical widening, and symmetrical widening. The alignments were designed to reuse as much of the existing pavement as possible, whilst minimising overlay thicknesses and not imposing unacceptable additional loading to the existing structures.

Source: The Motorway Archive

Geotechnics

Arup's geotechnics team applied a wide range of measures to enable reuse of materials. By processing site-won materials, pavement quality aggregate, concrete aggregate, drainage stone, building sand, selected granular materials, and cementbound material aggregates were produced for the project. This ensured a minimal import of materials and a largely balanced earthwork. Despite early concerns about the need for some 'selective' working to be done within glacial deposits, the use of motorised scrapers proved to be a great success, helped considerably by relatively good weather during the construction period.

The route crosses a variety of geological materials typical of the UK Midlands: the Sherwood Sandstone, Marcia Mudstone and Coal Measures strata. Overlying these strata, a variable thickness of superficial deposits relating to past glacial periods was present. Generally, ground conditions were good, but deep `sub-glacial' channels infilled by a variety of poorer materials were present in places. In addition, 16 areas of potentially contaminated land had to be dealt with. Quantitative risk assessments were carried out on the contaminated materials and in general the team was able to prove that most of it could be reused within the works.

In a significant number of areas, reinforced soil abutments proved a more cost-effective solution than piling, particularly since the specified class of granular backfill to the reinforcing straps was site won. Elsewhere, both piled and conventional shallow foundation solutions were adopted.

Part of the route corridor had to contend with shallow mineworkings and deep backfilled opencast excavations. Again, a range of measures was required - including drilling and grouting, surcharging, and structural solutions - to deal with these issues.

Source: The Motorway Archive

Pavement design

MEL’s 53 year concession to operate the toll motorway had a significant bearing on the pavement design and construction. The team designed a range of pavement options for use at different locations, so as to suit existing ground conditions and traffic loadings, and provide the most cost-effective solutions. Two principal options were selected for the main carriageway: continuously-reinforced concrete pavement (CRCP) with thin wearing course overlay, and fully-flexible bituminous construction. As well as ground conditions, the choice of option was based to a large extent on the availability of site-won materials, and the variability in width of the carriageway.

It was fortunate that the route traverses a very large quantity of glacial sand and gravel that could be, and was, processed to form a substantial portion of the motorway pavement. Approximately 50% of the length is constructed in CRCP using site-won aggregates, including all of the concrete, the cement-bound material, and capping. The pavement construction platforms of subbase and capping material were made stronger than the standard design in order to cope with the heavy construction traffic loading and reduce the risk of a premature, construction traffic-induced failure.

A 'concrete train' was used for the concrete pavement, laying the full 14.3m carriageway width in a single pass. The reinforcement was fixed in position in advance of the concrete train by an

innovative Australian method, used for the first time in the UK on this project; then the 220mm thick CRCP was overlaid with 35mm of thin wearing course to provide a quiet and smooth running surface.

The fully flexible pavement option was adopted for the M42 southern end, where modifications to existing carriageway of varying widths and depths were required, and at the northern end of the project where ground conditions were variable and generally much poorer. Conventional paving plant was used for laying the various pavement layers in single-lane widths.

Source: The Motorway Archive

Toll plazas

The multidisciplinary team of architects and engineers designed a total of 28 buildings for eight different needs at six toll station sites. The aim was to satisfy the functional requirements with integrated designs that emphasize corporate styling and value for investment, as well as safety and security. Close working relationships with the tolling systems' commissioners and suppliers were essential to ensure that all technical systems and building services were fully co-ordinated and integrated. A strong styling theme of curved roofs was developed for the main buildings, with particular attention given to the colour selection to satisfy the concessionaires and planning authorities. The priority of achieving safe and secure places that delight and are familiar to both toll users and operators' employees was maintained throughout the subsequent detail design stage.

Source: The Motorway Archive

“In total six toll stations were constructed featuring state-of-the-art technology to ensure a smooth and steady traffic flow. Motorists can pay either by cash or electronically by using the TAG system. People with exact change can use cash deposit machines for quick throughput. The use of electronic tags allows automatic access; motorists do not even need to stop. A tag is fitted behind the windscreen from which the toll charge is automatically deducted each time the vehicle passes through.”

Source: Road Traffic Technology

Operation of the toll system

To obtain revenue from all users, MEL needed to ensure that all drivers would pass through a toll point somewhere along their journey. Rather than establish control points at every entry and exit, toll points were established at a number of entry and exit points and two toll plazas, which stretch across the whole carriageway at two key points on the road itself. This means that drivers can join the M6 Toll at various junctions along the road and either pay on exit or pay at one of the toll plazas. The latter are situated at Great Wyrley (northbound) and Weeford Park (southbound).

The toll system classifies vehicles into different classes depending on the size of the vehicle. Prices vary between classes and alter according to the time of day and the toll station used – see Table 2 for summary. Payment can be made in an attended lane, using credit or debit cards or in cash or at an automatic booth, using credit or debit cards or coins only (no change given).

Table 2: Summary of current and past toll charges

Current charges Guide	Mon - Fri (06:00 - 23:00)	Sat - Sun (06:00 - 23:00)	Night (23:00 - 06:00)
Class 1 (e.g. motorbike)	£2.70	£2.50	£1.50
Class 2 (e.g. saloon car)	£4.70	£4.50	£3.50
Class 3 (e.g. saloon car & trailer)	£8.40	£8.00	£7.00
Class 4 (e.g. van/coach)	£9.40	£9.00	£8.00
Class 5 (e.g. HGV)	£9.40	£9.00	£8.00
2 January 2007 (source: http://www.cbrd.co.uk/motorway/m6toll/timeline.shtml)			
Class 1 (e.g. motorbike)	£2.50		£1.50
Class 2 (e.g. saloon car)	£4.50		£3.50
Class 3 (e.g. saloon car & trailer)	£8		£7
Class 4 (e.g. van/coach)	£9		£8
Class 5 (e.g. HGV)	£9		£8
Previous charges (source: Atkins, 2005)			
June 2005			
Class 2/3/ (cars/small vans)	£3.50		
Class 4/5 (lorries/coaches/large vans)	£7		
August 2004			
Class 2/3/ (cars/small vans)	£3		
Class 4/5 (lorries/coaches/large vans)	£6		
December 2003			
Class 2/3/ (cars/small vans)	£2		
Class 4/5 (lorries/coaches/large vans)	£10		

Each tag user has an electronic account, and every trip recorded on the tag is sent to the database to update the account. Details of use are only available to the account holder, with statements, including VAT, available online, 24hrs a day. Details are updated every working day. A statement is presented at the end of each month. To open an account, a balance equivalent to the value of ten journeys appropriate to vehicle class is required: tags are sent out in around ten working days. At all toll plazas a Tag symbol is displayed above the relevant lanes.

Source: www.m6toll/using

Table 3: Key engineering features

CONTRACT			
Contract Award/Effective Date	29 September 2000	Contract Period & Value (design & Construct)	40 Months/£485m
Contractor	CAMBBA (Carillion, Alfred McAlpine, Balfour Beatty, AMEC)	Contractual completion	January 2004 (road opened 9 December 2003)
MILESTONES			
5 Millionth Customer Date	29 April 2004	10 Millionth Customer Date	12 August 2004
PROGRAMME			
Initial Site Clearance/Fencing Start	November 2000	Environmental Mitigation Works	November 2000 to March 2001
Archaeological Investigations	November 2000 to Spring 2001	Major Construction Activity	April 2001 to December 2003
QUANTITIES			
Topsoil Strip	1,300,000 cubic metres	Excavation	9,200,000 cubic metres
Fill	7,500,000 cubic metres	Excavated material processed (drainage, pavement, concrete)	1,600,000 cubic metres
Structural Concrete	63,000 cubic metres	Steel Reinforcement	10,400 tonnes
Formwork	90,000 square metres	Reinforced Earth Panels	22,300 square metres
Structural Steel	9,613 tonnes		
ROAD CONSTRUCTION			
Main Line	1,369,000 square metres	Interchanges	184,000 square metres
Side Roads	447,000 square metres	Blacktop	800,000 tonnes
Carrier Drains	139,000 metres	Fencing/Hedges/Noise Barrier	165,000 metres
Safety Fencing	130,000 metres	Landscape Planting	4,430,000 square metres
STRUCTURES			
Existing Bridges (20)	Widened 8 Demolish 4 Change 8	New Bridges (57)	Overbridges 34 Underbridges 12 Footbridges 5 Rail Bridges 3 Link Bridges 3
Culverts	Watercourses 41 Toll Tunnels 6	Retaining Structures	Walls 7 Strengthened Earth 4
Sign Gantries	68	Lighting Columns	2,500
Communications Cable	200,000 metres		

Source: http://www.m6toll.co.uk/about/project.asp? - accessed September 2009

D PROJECT TIMELINE

Project timeline

The following project timeline has been assembled from a number of sources. It is constantly being updated as new evidence concerning the project emerges.

Year	Month	Type of Decision / Event	Key Decision / Event
1980		Policy	• White Paper, 'Policy for Roads in England'
1980		Project initiation	• The Government identifies the need for a new motorway to relieve congestion on the M6 in the West Midlands: study of two options; Greenfield inner corridor or outer corridor based on existing trunk roads
1984		Project initiation	• The Department of Transport identifies five options for a route and undertakes public consultation on these.
1986	March	Project initiation	• The Secretary of State for Transport announces the preferred route: a combination of two of the five options, which arcs to the north east of Birmingham between junctions 4 and 11 of the existing M6.
1986-1987		Project initiation	• Topological and ground investigation surveys to enable more detailed design for draft Line Orders
1987		Policy	• White Paper: 'Policy for Roads in England' (Cmnd 125).
1987	September	Project initiation	• Line Order published
1988	May - September	Project initiation	• Following local objections to the preferred scheme, a Public Inquiry is held.
1989	March	Project initiation	• Inspector's report on Public Inquiry.
1989	May	Policy	• The White Paper 'Roads to Prosperity', setting out a major road building programme, is published. It is followed by a Green Paper, 'New Roads by New Means', establishing private finance as the preferred method of funding.
1989	July	Project initiation	• The Secretary of State rules that the road will be built and decrees it will be financed, designed, constructed and operated by the private sector. Private sector competition takes place.
1990	April	Project initiation / Financing	• A preliminary pre-qualification competition is held. Three consortia bid for the concession and are invited to present their bids.
1990	October	Project initiation / Financing	• Concession bids presented.
1991	August	Project initiation / Financing	• A memorandum of Agreement is signed with Midland Expressway Limited (MEL) provisionally awarding the concession, subject to further public consultation.
1991	October	Policy	• New Roads & Street Works Act 1991 comes into force, enabling authorization of privately financed toll roads and bridges under 1980 Highways Act
1992	February	Project initiation	• MEL prepares a revised scheme with modifications to more than half of the original proposals, including measures to further reduce the environmental impact of the road, and to avoid needing to relocate existing roads.
1992	February	Project initiation	• The Concession Agreement is signed by the Government and MEL.
1992	March	Project initiation	• The route is published, incorporating further amendments

Year	Month	Type of Decision / Event	Key Decision / Event
			made during the design and environmental assessment process.
1992	June	Project initiation	• Non-publication of inspector's report on 1987 scheme (as original orders withdrawn) raised in House of Commons.
1993	May	Policy	• Green Paper, 'Paying for Better Motorways'
1993	June	Project initiation	• Draft proposals published relating to the line of the road, associated side road changes and the right to charge tolls. • Environmental statement published. • Concession statement published.
1993	September	Project initiation	• Objection period on 1993 orders ends
1993	December	Policy	• Secretary of State announces introduction of electronic tolling on motorways to help fund network improvements.
1994	February	Project initiation	• Technical update [incorporating new government advice on traffic modeling and environmental appraisal] and draft supplementary orders deposited.
1994	March	Project initiation	• Draft orders published on compulsory land purchase.
1994	June	Project initiation	• Second Public Inquiry into the MEL proposals opens. • Trunk Roads in England 1994 Review: "The Region is at the hub of the country's strategic road network." And "is at the forefront of the initiatives to introduce private finance to the Roads Programme".
1995	October	Project initiation	• Second Public Inquiry ends.
1997	July	Decision	• The Secretary of State recommends the M6 Toll as proposed by MEL should go ahead.
1997		Objection	• Legal challenges against the BNRR scheme by Alliance.
1998		Objection	• The Alliance Against the BNRR mounts an unsuccessful challenge to the scheme in the High Court
1999		Objection	• All challenges cleared.
2000	April	Implementation	• MEL invites bids for the construction contract. Two consortia bid.
2000	September	Implementation	• MEL issues a tender for design and build contract which is won by the CAMBBA consortium.
2000	October	Implementation	• Design work begins.
2001	January	Financing	• 53 year concession agreement commences.
2001		Implementation	• Minister announces name for the road as the M6 Toll
2001	May	Implementation	• Main earth works start
2003	May	Implementation	• Toll prices announced • A Director of Macquarie Investment Group leaves his post after making controversial remarks about the tolls which are to be levied - he told an Australian newspaper that the company could charge drivers "whatever we like" as the British Government had not imposed any toll limits.
2003	December	Implementation	• Opening of M6 Toll Road by Alistair Darling, Secretary of State for Transport, on budget and six weeks ahead of schedule
2004	March	Operations	• The Freight Transport Association criticises toll levels for HGVs - it says new figures suggest that lorries make up less than 5% of the total toll road traffic while 45,000 goods vehicles use the M6 each day. MEL counters that: "With running costs of a truck at around £30 an hour, £8.50 (after VAT reclaim and launch discount) to make a

Year	Month	Type of Decision / Event	Key Decision / Event
			predicted time saving of 45 minutes on the M6 Toll is a price worth paying".
2004	August	Implementation	• 10 millionth customer recorded over the route.
2005	June	Financing	• Autostrada sells its 25% stake to Macquarie Group, which thus becomes the sole owner. • Toll road prices are increased • The number of vehicles using the route in January 2005 rose by 25% on the same month in 2004, taking the average daily traffic to 43,344, compared to 32,763.
2006		Financing	• Macquarie refinances the project and secures a significant profit. • Agreement with government to invest £112m in the West Midlands road network – improved link with M42, extra lane on southbound M42 where it diverges from M6 Toll (contract awarded to Costain), and [untolled] link road to M54 and Telford.
2008	June	Post-Implementation	• Improved link with M42 and extra lane on southbound M42 due to open.

Sources: http://www.bbc.co.uk/news; http://www.bbc.co.uk/stoke/travel/tollroad/timeline.shtml; http://www.m6toll.co.uk/about/project.asp?; http://www.m6toll.co.uk/about/project.asp - 'Project History', Accessed 30th June 2009; Department of Transport (1994); http://news.bbc.co.uk/1/hi/england/west_midlands/3996025.stm

E PROJECT FUNDING/FINANCING

The Concession with Midland Expressway Ltd

On 28 February 1992, the UK Government signed a concession agreement with Midland Expressway Limited (MEL) to first obtain planning approval and then design, build, finance and operate the M6 Toll. The concession agreement had as its core agreement:

"2.1 Subject to and in accordance with the provisions of the Concession Agreement, the Concessionaire shall have the right and the obligation to carry out the design, construction and completion of the Works and the financing, operation and maintenance during the Concession Period of the Project Facilities together with the Motorway Service Areas which it shall do at its own cost and risk without recourse to Government Funds (except pursuant to the Concession Agreement or as otherwise permitted by operation of law) or to Government guarantees. The Concessionaire may, if it thinks fit, improve the Project Facilities subject to and in accordance with the provisions of the Concession Agreement.

2.2 The Concessionaire shall from the date of issue of the Permit to Use open the Concession Road for public use and shall not prevent or restrict Permitted Traffic from using the Concession Road subject to Permitted Traffic, other than Exempt Traffic, paving Tolls in respect of the Tolled Element in accordance with the relevant toll order and in accordance with the programmes referred to below. The Concessionaire shall be entitled to fix Tolls at such rate or rates as it may think fit provided that: …" (proper consultation with the Department for Transport was carried out and a suitable period of notice given).

Source: Concession Agreement for the Birmingham Northern Relief Road

Having progressed the scheme through the public inquiry and planning processes, including the preparation of an environmental impact statement, MEL arranged finance and tendering and negotiated the construction contract for the project. Financial close was reached on 29 September 2000. The concession was for 53 years. MEL was given overall responsibility for the design, construction, operation and maintenance of the M6 Toll motorway. This includes establishing the toll charges for types of vehicles. Originally a joint venture, MEL is now fully owned by the Macquarie Group.

The original basis for the contract was described by Farrell (1994) as:

"The contract was awarded under competitive tender to a joint venture of Trafalgar House and Italstat for a concession of 53 years. The investment structure can be illustrated from the proposal that the revenue generated by toll collection and the tariffs would be set at levels necessary to recoup about £100,000 per day, such that the repayment of the £450m construction costs with interest will take just over 12 years. Using an assumption for revenue of £1.8bn and assuming that the cost can be broken down into £300m construction costs, £50m operational cost and £100m finance cost; the assessment the implications of the risks carried by the Promoter give an approximate Internal Rate of Return of 28% and a Net Present Value of £1.35bn at 10%." (Farrell, 1994, P 232)

In 2005 the House of Commons Transport Committee described the award as:

"Midland Expressway Limited were awarded a 53 year concession to run the M6 Toll until 2054. The privately financed M6 Toll cost £485m to build and Macquarie Infrastructure Group put the total project cost at £900m. … The total investment outlay to develop, design and build the M6 Toll was approximately £900m, with the only cost to the government being an £18m contribution towards rebuilding part of the connecting M42. The entire development cost (and risk) was transferred to the private sector." (House of Commons Transport Committee, 2005)

However ultimate responsibility for highway and transport across the region still lies with the Department for Transport, the Highways Agency, regional agencies and local government. Even though this is a private venture and is privately operated it is still a public highway like the rest of the country's roads.

Traffic Forecasts and funding/financing Implications

The road funding agreement depended heavily on the potential levels of traffic and payments by users. This was analysed by Adams (1994) in the following terms:

"Traffic forecasts, including response to tolls, was obviously crucial to MEL's assessment of the viability of the scheme. Traffic forecasts were produced via a combination of conventional transport planning methods and the application of market research techniques, in a two stage process. A conventional traffic model (using an all or nothing assignment over three time periods) was first used to forecast flows on the BNRR as if it were a free road. The no-toll flow was then factored down to account for the effect of imposing a toll, on the basis of demand curves derived from the market research.

The market research techniques comprised large scale interview surveys of drivers using service areas on the M6 and A5, household interview surveys of local motorists, and interviews with commercial transport managers. Interviewees were asked how likely they would be to use the BNRR if it were free, and at various levels of tolls.

The data allowed demand curves to be produced for three types of user: car drivers, HGV owner/drivers, and HGV drivers whose route choice would be determined by their transport managers. Data were available to further disaggregate demand (by time of day and business / leisure use) but the response was sufficiently consistent to make this unnecessary. Use of market research in this manner was an unconventional approach to traffic forecasting. However at a late stage in the bid process, MEL had the opportunity to compare the values of time implied by its survey with responses to a stated preference survey undertaken by the Department for Transport on behalf of all of the bidders. The results compared well.

Toll levels could be set directly from the demand curves to maximise revenue. In practice, revenue was found to be rather insensitive to small changes in tolls around the maximising level. On this basis tolls were set at £1.50 for cars and light vans, and £3.00 for HGVs (in 1990 prices), with the exception of the Churchbridge station where tolls of £0.60 and £1.80 were proposed.

The terms of the invitation to tender (and the New Roads and Street Works Act 1991) give MEL the right to set and subsequently alter its tolls in response to market conditions once the road is open."

Source: Adams, 1994, pp119,120

Funding sources

The original funding basis and the refunding were described by Robert Bain (Standard & Poor's) as follows:

"Macquarie Infrastructure Group has recently sealed an innovative deal to refinance the M6 Toll road. Robert Bain, credit analyst at Standard & Poor's, discusses the various credit strengths and weaknesses within the £1bn transaction.

A complex transaction refinancing the debt of the M6 Toll road in the UK was completed on 29 September 2006. Having analysed the deal, we at Standard & Poor's assigned a long-term debt rating of 'BBB' to Macquarie Motorways Group Ltd's (MMG) two loan facilities and 30-year step-up swap overlay. Both loans have a stable outlook. This transaction successfully replaces the previous £620m debt facility with loans of £1.03bn and new interest rate swaps.

The two loans, both due in 2015, are being used to repay the original loan facilities secured by the concessionaire of the M6 Toll – Midland Expressway Limited (MEL) – to finance the construction of the 42km M6 toll road. As a result of refinancing, MEL has been able to release £392m to its 100% owner – Macquarie Infrastructure Group (MIG).

In assigning an investment grade rating to both loans, there were significant project risks we at Standard & Poor's needed to become comfortable with. Therefore, although this concession road financing is exposed to several key risks, there are credit strengths within the transaction's structure offsetting these weaknesses.

Another risk is the M6 Toll concession's aggressive financing structure. The transaction employs an accreting debt instrument that schedules the payment of principal and interest at a time and rate that corresponds to the quantum of future toll revenues. The total debt increases in the early years of the project; unpaid interest charges compound as initial toll revenues remain insufficient to cover the cost of servicing the debt. Furthermore, the concession has high debt-to-EBITDA multiples and deferred principal amortisation – adding to risks associated with the M6 Toll transaction. However, all three features of this structure are typical of recent medium- to long-term concession road financings.

Certainly, the two loan facilities represent a successful refinancing of the original M6 Toll road project debt. However, the project company could find it more difficult to refinance the transaction either prior to, or at the scheduled maturity of, the term loan. This refinancing risk – especially prevalent upon the maturity of the £1bn nine-year bullet loan – may arise in the context of constrained market access or a widening of credit spreads. As such, Standard & Poor's ran a series of stress tests to assess the transaction's resilience to deeply unfavourable future interest rate movements.

<u>Redeeming credit strengths</u>

The credit risks outlined are offset at the investment grade level by key strengths within the M6 Toll Road refinancing transaction's structure, and within the project itself. Despite the aforementioned refinancing risk, the terms of the 30-year step-up swap mitigate reference rate risk. The swap fixes the interest rate on the facility at 1% plus the credit margin during the first five years, which then increases by 25 basis points each year up to 8%. The swaps accretion is reduced by a cash sweep in the first five years. Further to this, the permitted dividend distribution lockup tests are set higher than the usual rating – standing at 1.4x.

Another significant mitigating factor is Standard & Poor's familiarity with the contractual provisions and lender safeguards. This stems from the concession project's consistency with others tried and tested across the UK to design, build, finance and operate roads.

Additionally, the M6 Toll has been operating for over 32 months; therefore its track record provides us with some comfort regarding asset usage going forward. Despite a slow start, traffic volume has picked up for the toll road. Truck volumes did remain relatively low – prompting MEL to extend the discount period for HGVs from an early stage to attract a higher proportion of these particular customers onto the facility. The project's financial model has been updated to reflect observed asset usage and growth to date, and traffic projections have been adjusted accordingly – partially offsetting the transaction's exposure to traffic and revenue risk. The refinancing transaction now incorporates modest traffic growth assumptions that provide for solid and more predictable revenue growth prospects.

The strong competitive position of the M6 Toll in relation to the primary alternative route through the West Midlands conurbation – the M6 motorway – provides a key credit positive. Prior to the toll road's opening, the M6 had been carrying over 160,000 vehicles through Spaghetti Junction every day – with the busiest section of the motorway supporting up to 180,000 vehicles while only designed to carry 72,000. The toll road's very strong competitive position is supported by the limited scope for additional high-capacity motorway construction in the area.

Standard & Poor's is confident – at an investment grade level of certainty – that the financial model can survive a reduction of traffic from the low case assumptions of the lenders' consultant. The model is similarly resilient to combined downside sensitivity tests. Using this traffic low case, the debt service coverage ratios are adequate at 1.65x minimum and 1.98x average.

Credit strength is boosted further by the reasonably long length of the concession – with 48 years remaining. The financing of the concession allows for a 10.5-year tail. Standard & Poor's is aware that other debt balances – including land fund and tax liabilities – are scheduled for repayment during the final years of the concession.

A cash sweep is in place for the swap counterparty and senior lenders, helping contribute to principal repayment earlier in the concession term than is the case with comparable long-term toll road concessions."

The refinancing was carried out in agreement with the Government:

'Macquarie Infrastructure Group (MIG) today advised that the UK Government has acknowledged the refinancing of the M6 Toll is to proceed as set out under the terms of the concession agreement. It is anticipated the refinancing will occur later this year.

In addition, MIG will sign an agreement with the UK Government to invest up to £112m into the West Midlands road network through a mix of capital, subject to a fixed escalator, and operating and maintenance costs. The investment will be funded through facilities established as part of the M6 Toll refinancing process." (Macquarie 2006)

As part of the agreement, some resources released from refinancing of the M6 Toll were made available for improvements to adjacent highways, including construction, operation and maintenance of a new road from the M54 and Telford to the M6 and the M6 Toll as well as

improvements worth up to £10m to the slip road access from the M42 to the southern end of the M6 Toll.

Source: Infrasite (2006)

Commentary on funding/financing

The scheme has not been profitable to date for MEL, because of the existence of competing toll-free routes, a boycott by many haulage companies and over-optimistic time saving and traffic forecasts - "MEL never published its forecast traffic volumes, but estimates … by … Steer Davies Gleave group suggested that about 70,000 vehicles per day would be using the road within a year of opening, and 80,000 after three years". Thus "MEL reported an operating profit of around £16m in 2005. Total revenue was £45m, with staff and other operating costs amounting to £11.4m and depreciation of £17.4m. Taking into account net interest costs of around £43m, this left an overall loss of £26.5m in 2005 – its first full financial year. At this stage long term debt was £819m. Since then tolls have been raised, interest repayments have been reduced through refinancing and a number of large developments, including distribution centres, have been attracted to the vicinity of the route. It is plausible, therefore, that the motorway will return a profit in the medium term."

Source: Wellings & Lipson, 2008

Wellings & Lipson's analysis is based on MEL's interim financial statement (2005), which gives more detail of traffic volumes and revenue for the year. Subsequently, "A revised tolling strategy was announced in November 2006 and implemented on 1 January 2007 (MEL, 2006) – 2006 results and MEL's commentary are summarized below:

"We expect to see traffic levels positively impacted by the ongoing roadworks on the competing section of the M6 until July 2007, however growth in 2007 is not expected to be as strong as 2006 when there was a significant amount of roadworks on the competing section of the M6.

Cost savings and greater efficiencies in the use of resources are being driven across all departments. MEL aims to further reduce cash collection by attended methods and will seek to continually promote payment by credit card/ tag and automatic coin machines (ACM). Automatic collection of tolls now accounts for approximately 70% of all transactions, enhancing efficiency and convenience for customers."

On future revenue streams, MEL (2006) notes:

"The Company's ability to generate value stems from its capability to sustain and enhance revenue growth via repeat business, new customers and toll increases. In addition, we constantly review operational expenditure to enhance efficiencies throughout the business.

Revenue growth remains dependent upon the future demand for our service as a bypass to Birmingham as well as the level of tolls levied. Local factors that will positively impact future demand include the ongoing review of the Lichfield Local Plan, business park developments proposed in Staffordshire and the expansion of Birmingham Airport. Other factors that will contribute in the medium term include the creation of a direct link with the M54 to be built by MEL and will open up access to markets in Telford, Shrewsbury and North Wales. The Active Traffic Management on the M42 has improved running conditions and the Highways Agency is

proposing to expand the scheme. Future growth will also be impacted by our pricing policies which are designed to sustain free flowing conditions and the possible expansion of services within the MSA."

"In the long term, growth will occur as a result of enhanced use of the motorway network and corridor which MEL has under surveillance via our screenline reporting and analysis. Trends over the last two quarters of 2006 have illustrated the strategic importance of the M6 Toll when roadworks are in place on the M6. Like 2004, we have seen strong traffic growth across all classes during periods of roadworks on the M6.

Figure 7: MEL Cost-Revenue Data 2005-2006

Results	Qtr 2 to Dec-05 £'000	Qtr 3 to Mar-06 £'000	Qtr 4 to Jun-06 £'000	Qtr 1 to Sep-06 £'000	Qtr 2 to Dec-06 £'000
Revenue	12,715	11,284	13,166	15,835	14,715
Operating Costs	(2,069)	(2,091)	(2,127)	(2,143)	(2,000)
Operating EBITDA	10,646	9,193	11,039	13,692	12,715
Operating EBITDA%	**83.7%**	**81.5%**	**83.8%**	**86.5%**	**86.4%**
Commercial administration	(780)	(169)	(220)	(334)	(121)
EBITDA	9,866	9,024	10,819	13,358	12,594
Depreciation & Amortisation	(6,400)	(4,355)	(4,352)	(8,597)	(5,173)
Interest and Similar Charges	(10,266)	(10,150)	(11,076)	(14,820)	(14,603)
Net Loss	**(6,800)**	**(5,481)**	**(4,609)**	**(10,059)**	**(7,182)**

Notes: Commercial Administration is shown separately from ongoing operating costs and is not anticipated to be a long term cost. There were exceptional one off charges on refinancing in August 2006:

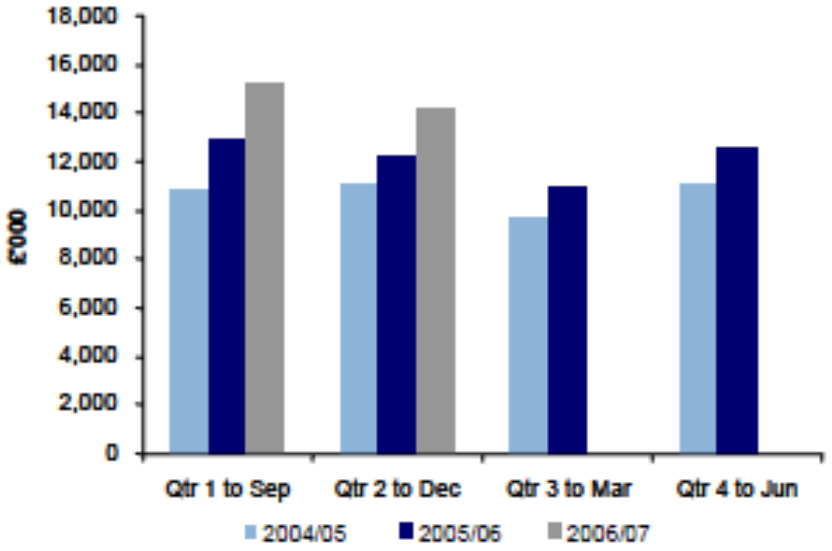
- Amortisation of the arrangement fee of £4.4m on the original bank finance;
- Swap termination payments of £3.0m.

Source: MEL (2006)

Figure 8: MEL Cost-Revenue Data 2004/05-2006/07

Toll revenues (net of VAT) reached £29.4 million in the first half of 2006/07, an increase of £4.3 million or 17.1% over the corresponding period last year (Figure 13 above). The rise was largely driven by road works on the competing M6. There was no increase in toll charges. Figure 14 compares quarterly revenue since opening.

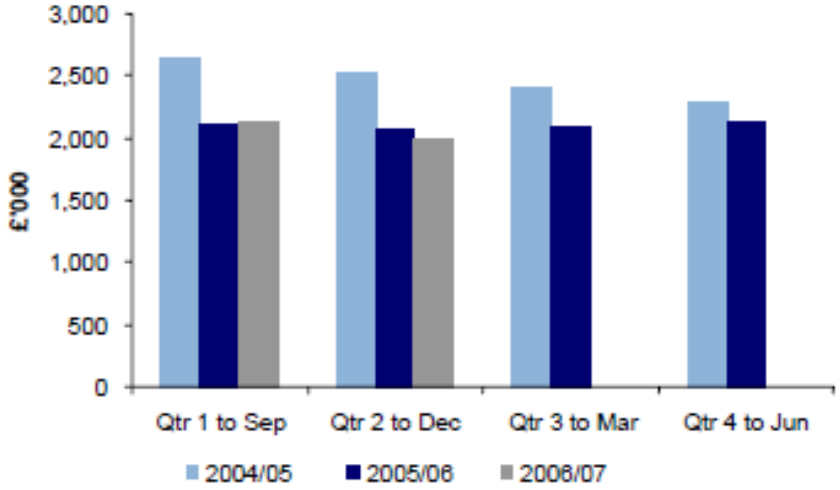
Figure 14: Toll Revenues (£'000) Financial Year Ending 30 June



The company continues to focus on reducing operating costs across all departments. The economies realised are demonstrated within Figures 15 and 16.

For the first three years of the Concession, the cost of landscaping has been assumed by the contractor CAMBBA. From January 2007, this became a MEL responsibility. No major interventions under the periodic maintenance budgets are anticipated before 2010.

Figure 15: Operating Costs (£'000) Financial Year Ending 30 June



Source: MEL (2006)

M6 toll road pays Macquarie £392m - Jim Armitage, Evening Standard, 25 August 2006

"THE Government was facing another major Private Finance Initiative rip-off storm today as the owner of the controversial M6 toll road refinanced the project and cashed in a profit of almost £400m just three years after it opened.

The road, Britain's first toll-operated motorway, was built to ease congestion in the Birmingham area, but its perceived high prices created a storm of protest. However, project owner Macquarie Infrastructure Group today said it had rearranged the debt facilities on the project in a move 'releasing' £392m for itself.

MIG justified its cashing in by pointing out that it has agreed to invest up to £112m to develop certain parts of the route in future years. Users of the road pay £3.50 for cars and £7 for vans and lorries - prices deemed too high by many users. The Government was widely criticised for not agreeing to caps on Macquarie's charges for the route.

In May 2003, Macquarie executive Dennis Eager boasted: 'We can put up the tolls by whatever we like and start the tolls on day one at whatever we like. If motorists don't complain about it being too high, we have done our job properly.'

The outrage his comments caused led to his resignation but, for many, his views were an honest appraisal of the PFI model, which draws on private sector money to build and then run public sector projects like hospitals and schools.

Chancellor Gordon Brown, a PFI fan, claims the projects take the risk of overspending off the taxpayer and lead to fewer delays. But many in Labour have called for a moratorium on project awards until a clearer case can be made that they offer the taxpayer value for money.

PFIs that have seen private sector companies cashing in include the notorious refinancing of Norfolk & Norwich University Hospital, which the National Audit Office said resulted in **windfall** profits of £73m by banks and developers.

The roads are supposed to be a public good. Its understandable that the private sector expect a return as they had also invested. However £3.50 non-return is ridiculously high for road users to pay as the A5 is highly congested."

F OPERATIONS – TRAFFIC VOLUME

The principal role intended for the M6 Toll Road was relief of the original M6 through the northern fringe of the West Midlands conurbation. As a toll road, the key assumption was that drivers would pay to use the toll road in order to save time. Forecasts therefore needed to incorporate the level of charge and willingness to pay as well as the time savings which drivers might envisage making.

Computer based traffic modeling and market research into responses to tolling undertaken for MEL, covering an area from north of Stoke to the M25, and from west of the West Midlands to Leicester, were based on predicted traffic flows for a 15 year period from 1996 (the assumed year of opening) to 2011. Two sources of uncertainty arose: the rate of traffic growth and responses to tolling.

The forecasts assumed low growth for traffic with an origin or destination in the West Midlands, largely due to capacity restraints. There were three forecasts of responses to tolling – 'design usage' is predicted traffic given planned toll levels, whilst 'upper usage' and 'lower usage' are optimistic (approaching "the level at which free flowing conditions on the motorway would start to break down") and pessimistic (predicting higher levels of flow on the surrounding network, were used to assess environmental effects in areas more remote from BNRR) about take-up respectively. Baseline forecasts – the 'do minimum' approach including other planned road schemes but not the BNRR – were also prepared.

The Highways Agency/Atkins (2005) 'One Year After Study' found traffic growth on the M6 toll was substantially higher than the national average, particularly in summer 2004 during a period of major roadworks on the corresponding section of the M6.

However, on the bypassed section of the M6:

- traffic between J9-J10 reduced by about 5% (between 3% or 4,300 – and 7% or 9,700) from pre-toll [1993] figures of 160,000+ vehicles per day but was rising slightly (although still below 2003) in the first three months of 2005;

- similarly on J4a-J5, traffic dropped in 2004 but began to rise again in 2005 when roadworks were completed. This area had the greatest reduction in traffic on the M6 - 17,000 or 11%.

On the M6 north and south of the M6 Toll, increases of 13% and 10% were experienced while on the A50 near Stoke-on-Trent there was a reduction of 6,200 or 9%. HGV traffic reduced on the A50 and A5 but to a lesser extent than light traffic.

Little change was experienced in HGV traffic on the M6 - HGVs accounted for 7% of M6 Toll traffic in March 2005 (MEL's vehicle classifications differ from those used in the HA/Atkins Report, so comparable figures are not available).

Detailed figures are provided in Tables 4 and 5 below and a geographical breakdown in Figure 8.

The Department of Transport estimates journey times using MIDAS, Satellite Tracking & Trafficmaster – significant improvements on the M6 northbound in the afternoon peak and

southbound in the morning peak, while journey times on the M6 toll were 4-18 minutes faster. See Figure 10a.

A study of route choices on the M6, J3-J12, M40 J16-M6 J12 found: “Data from satellite-tracked vehicles shows that roughly 30–40% of vehicles making through trips between J3 and J12 of the M6 use the M6 Toll. However, these are predominantly fleet vehicles and may not make choices representative of all motorway users.”

Table 4: Sample data from forecasts (vehicles per day)

	1996	2011 ‘do minimum scenario’	2011 with BNRR - ‘do something’ scenario
M6 J9-10	142,000	175,000	159,000
M6 J4a-5	140,000	169,000	154,000 + more local traffic transfer
A5 through Bridgtown	43,000	56,000	40,000
A5 overall	16% - 34% increase		Significant relief
A38 Weeford – Bassets Pole	44,000	62,000	50,000
A446 South Dunton	23,000	38,000*	“the highest reductions are forecast” – 39,000*
A446 overall	35% - 80% increase		
“In addition there would be some increases in traffic flows on some existing roads giving access to the BNRR” (para 9.18) – (2011 forecast)”			
M6 north of J11/BNRR		115,000	132,000
M6 south of J4/BNRR		140,000	149,000
Proposed Burntwood Western Bypass			15,000
A5127 north of Wall Island			Slight increase in flows
A5 east of Weeford Island			Slight increase in flows
A453 east of Bassetts Pole			Slight increase in flows
A38 Weeford Island – Lichfield			64,000
BNRR Dunton – Water Orton (combined with M42)			167,000 – M42 would need widening to five lanes north, with three BNRR lanes south segregated from our lanes of M42 inc slip road – high traffic volumes and extensive weaving
BNRR Coleshill – M6			46,000
BNRR Chasewater/Burntwood – Shenstone			68,000

Source: Department of Transport (1994b)

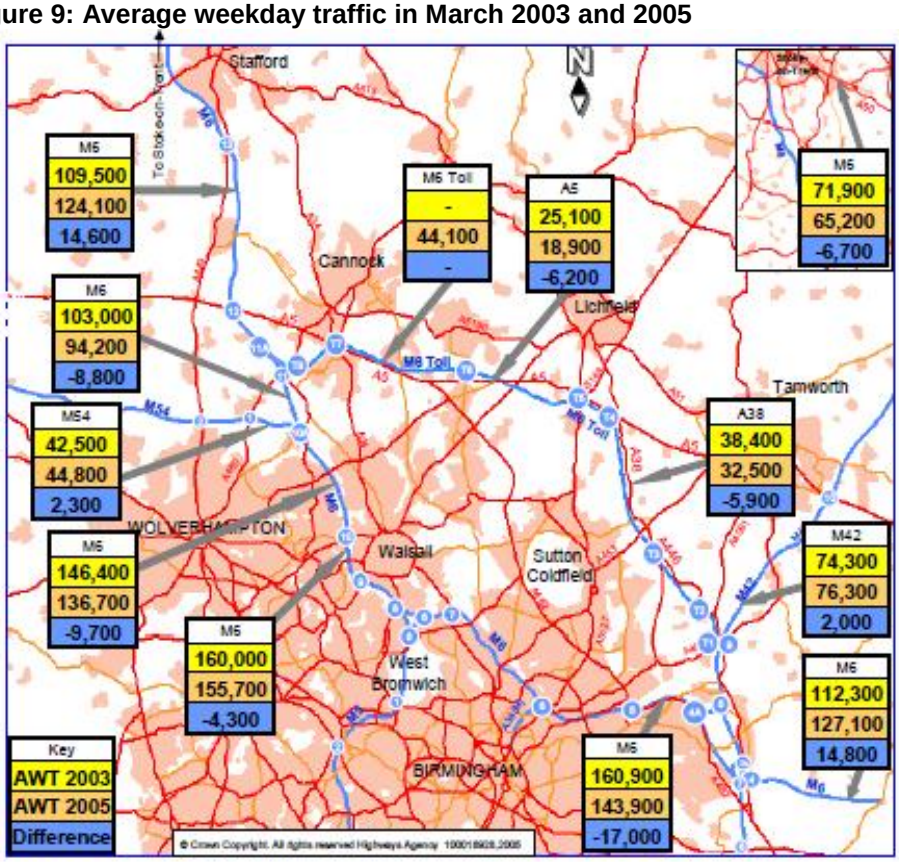
Table 5: Average weekly traffic before and after M6 Toll Road opening

Table 2.1 – Average Weekday Traffic Before and After the opening of the M6 Toll

Road	Section	All Vehicles						Number of HGVs			
		Before	After		% Change						
		March 2003	March 2004	March 2005	2003–2004	2004–2005	2003–2005	Nov. 2003	March 2004	March 2005	%HGV March 2005
M6 Toll	T2 – T3, Wishaw/The Belfry – A38		36,000	41,300		15%		-	-	-	estimate 7%
	T3 – T4, A38 – A5 Weeford Island		36,400	41,700		15%		-	-	-	
	T5 – T6, Shenstone – Brownhills		38,100	44,200		16%		-	-	-	
	T6 – T7, Brownhills – A34		37,900	44,100		16%		-	-	-	
M6	J3 – J3A (East of M6 Toll tie-in)	*112,300*[1]	123,600	127,100	*10%*	3%	*13%*	35,400	36,400	38,600	30%
	J4A – J5	160,900	143,800	143,900	-11%	0%	-11%	42,100	42,400	43,400	30%
	J9 – J10	160,000	155,000	155,700	-3%	0%	-3%		-	*42,200*	27%
	J10 – J10A	146,400	137,700	136,700	-6%	-1%	-7%		-	*37,300*	27%
	J10A – J11	103,000	94,100	94,200	-9%	0%	-9%	33,600	33,800	33,300	35%
	J12 – J13 (North of M6 Toll tie-in)	109,500	123,800	124,100	13%	0%	13%	-	-	34,900	28%
M42	J6 – J7 (northbound only)	*67,000*[2]	68,000	64,800	*1%*	-5%	-3%	-	-	-	
	J9 – J10	74,300	76,400	76,300	3%	0%	3%	-	-	-	
A38	A5 Weeford Island – A453	38,400	33,800	32,500	-12%	-4%	-15%	7,300	7,000	6,600	20%
A5	East of Brownhills (A452 – A461)	25,100	19,600	18,900	-22%	-4%	-25%	6,300	5,800	5,600	30%
	East of M6 J12, West of Cannock	19,500	18,100	16,100	-7%	-11%	-17%	-	-	-	
M54	M6 J10A – J1	42,500	43,500	44,800	2%	3%	5%	10,300	10,700	11,300	25%
A50	East of A520 near Stoke on Trent	71,900	65,100	65,200	-9%	0%	-9%	14,900	13,900	13,800	21%

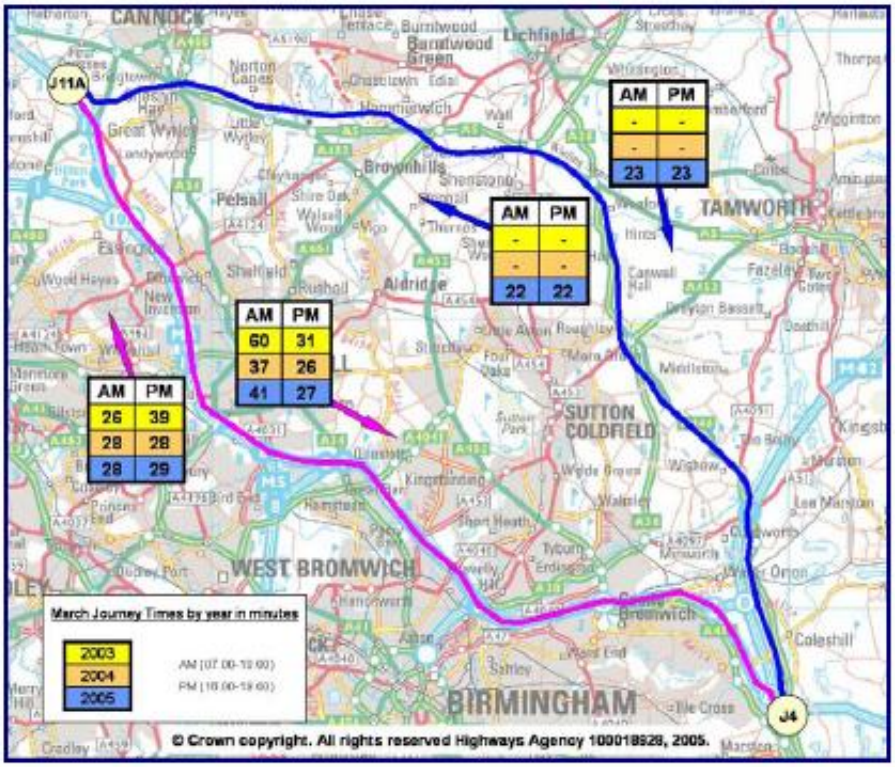
Source: Highways Agency, 2005

Figure 9: Average weekday traffic in March 2003 and 2005



Source: Highways Agency, 2005

Figure 10: Midweek journey times from M6 J4-J11A on M6 or M6 Toll



Source: Highways Agency, 2005

Commentary

" … goods vehicles were originally envisaged to be a major source of revenue but many haulage companies have boycotted the toll road. Hauliers often charge a fixed rate for a delivery and, given their competitive, low-margin industry, the tolls dent their profits – especially where the speed of delivery is of low importance."

Source: Wellings & Lipson, 2008

"More than 50% of operators who are currently using the M6 Toll road say that they will abandon it following the price increase to £7, according to the latest results from the Commercial Motor/Michelin Business Monitor. Currently only 25% of those operators surveyed said that they use the toll and 53% of them said that the hike will force them to consider alternative routes. The majority of operators who are using the route said that a reasonable fee for the toll would be between £1 and £3".

Source: Commercial Motor (2005)

Daily traffic

- Traffic built up from the first full month (January 2004) and peaked in the summer of 2004, at about 55,000 vehicles a day;

- Tolls for cars were increased in August 2004, there was then a decline which continued to January 2005;

- The figures from February to May 2005 showed that traffic had apparently recovered;

- A further price increase from 14 June 2005 caused another decline;

- In January 2006, traffic was 34% below its peak, partly due to seasonal factors;

- By June 2006 the traffic was back above the traffic figure 12 months before, though still 13% below the peak;

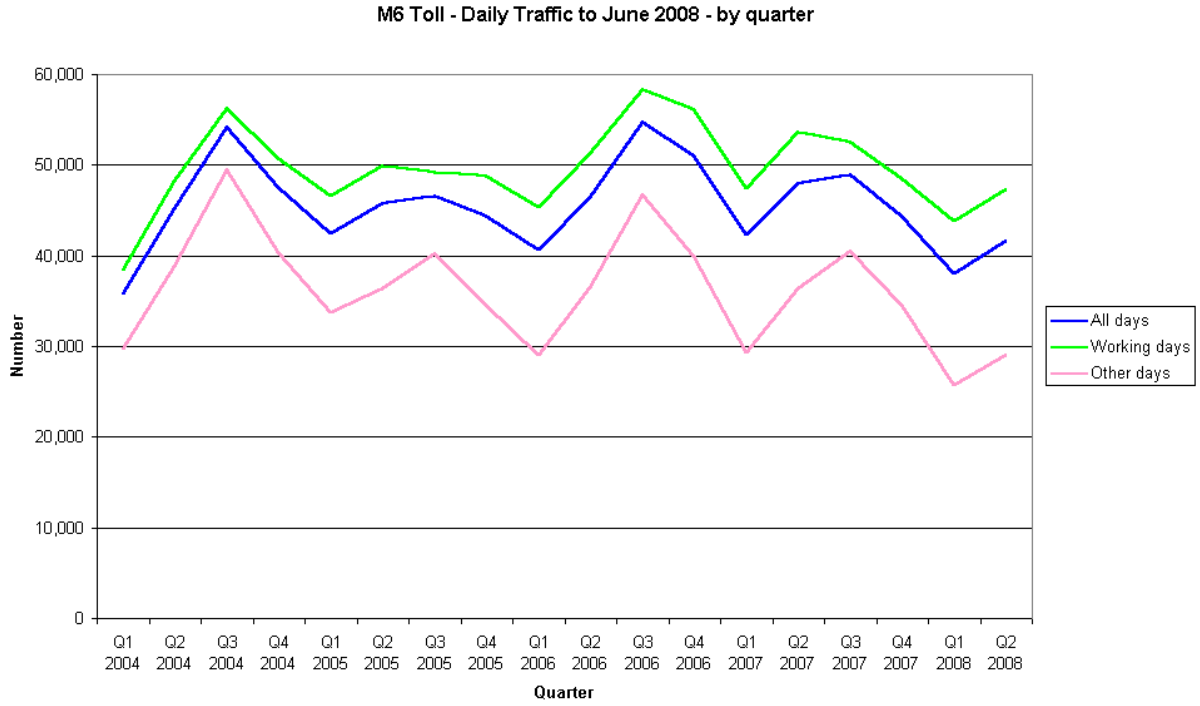
- The figures further improved in the second half of 2006, reaching 55,000 vehicles in the third quarter, although this may have been due to road works on the equivalent stretch of the untolled M6 from June till December 2006;

- As we predicted the road seems to be mainly used by a hardcore of drivers who seem to be unaffected by the price. The price increase in January 2007 had little effect on the traffic already using the M6 Toll, with the traffic for 2007 averaging only about a 5% reduction on the year before, and even this reduction may have been more to do with a reduced number of road works on the untolled road;

- Traffic fell in the first half of 2008, following the January 2008 increase, although there were other factors. What does seem fairly clear is that there is no sign of the traffic growth that the Company must be hoping for.

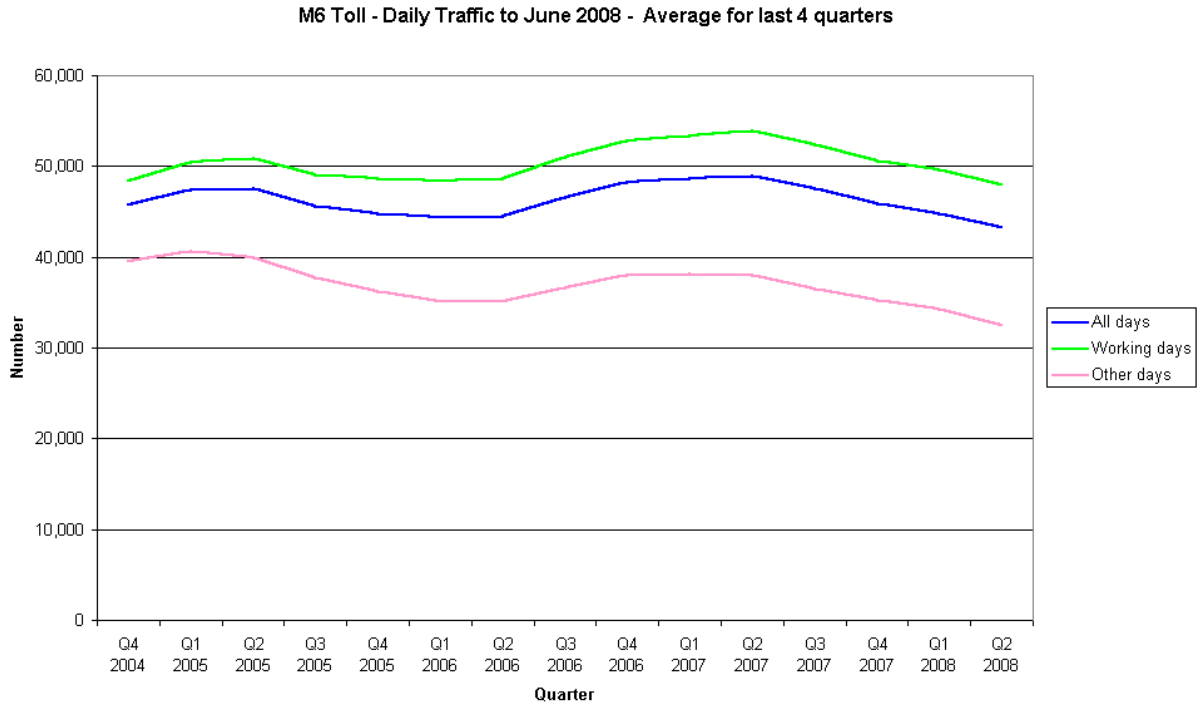
Figures 10a and 10b below are based on the M6 Toll company's figures - from July 2006, the company and its MIG parent moved to only reporting quarterly traffic figures. Although the numbers seem high, when compared with the 200,000 vehicles a day on the untolled M6, the tolled road appears to be empty. Most drivers are sending a message to the politicians that they will avoid toll roads when they can.

Figure 11: Quarterly traffic to June 2008



Source: Highways Agency (2005)

Figure 12: Quarterly traffic to June 2008



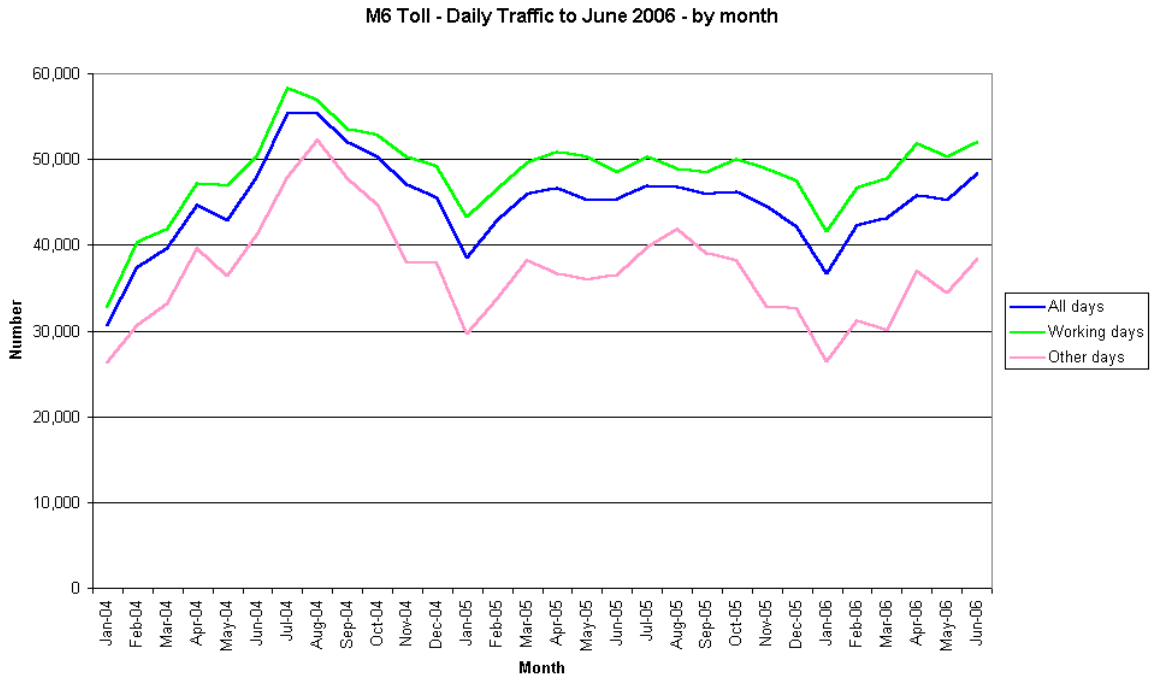
Source: Highways Agency (2005)

Table 6: Quarterly traffic figures from opening

Qtr	Daily traffic working days	Daily traffic other days	Daily traffic ALL days	% change from previous qtr	% of peak qtr	% change from previous year
Q2 2008	47,249	29,005	41,635	9	76	- 13
Q1 2008	43,828	25,697	38,050	-14	70	- 10
Q4 2007	48,474	34,570	44,401	-9	81	- 13
Q3 2007	52,601	40,535	48,929	2	89	- 11
Q2 2007	53,658	36,385	47,964	14	88	3
Q1 2007	47,487	29,335	42,243	-17	77	4
Q4 2006	56,115	39,904	51,005	-7	93	15
Q3 2006	58,276	46,667	54,743	18	100	18
Q2 2996	51,349	36,503	46,455	14	85	2
Q1 2006	45,393	28,997	40,657	-8	74	-4
Q4 2005	48,814	34,627	44,342	-5	81	-7
Q3 2005	49,208	40,227	46,573	2	85	-14
Q2 2005	49,889	36,358	45,726	8	84	1
Q1 2005	46,565	33,749	42,435	-11	78	18
Q4 2004	50,774	40,415	47,621	-12	87	
Q3 2004	56,257	49,455	54,261	20	99	
Q2 2004	48,289	38,782	45,155	26	82	
Q1 2004	38,396	29,751	35,831		65	

Source: Highways Agency (2005)

Figure 13: Monthly traffic to June 2006



Source: Highways Agency (2005)

24 hour traffic flows:

- The average 24-hour weekday two-way traffic flow (Monday to Friday) between Shenstone and Chasetown in March was about 37,500 vehicles per day, approximately 27% higher than in January;
- Traffic on the M6 Toll continues to rise. Traffic volumes in April have risen 12% compared to March;
- Weekend flows are high at about 32,000 vehicles daily;
- Saturday flows rose by more than 50% between January and March 2004;
- M6 Toll traffic flows on recent Bank Holidays reached around 40-50,000 vehicles daily;
- Traffic flows comprise mainly cars and light vehicles.

Source: Highways Agency (2005)

Table 7: Monthly Traffic Figures January 2004 – June 2006

Month	Daily traffic working days	Daily traffic other days	Daily traffic ALL days	% change from previous month	% of peak month	% change from previous year	Daily traffic previous year
Jun-06	51,959	38,401	48,344	7	87	7	45,325
May-06	50,314	34,444	45,195	-1	82	same	45,274
Apr-06	51,811	36,954	45,868	+6	83	-2	46,591
Mar-06	47,726	30,033	43,160	+2	78	-6	45,961
Feb-06	46,660	31,190	42,240	+15	76	-2	42,917
Jan-06	41,632	26,414	36,723	-13	66	-5	38,474
Dec-05	47,499	32,633	42,224	-5	76	-7	45,548
Nov-05	48,852	32,844	44,583	-4	81	-5	47,056
Oct-05	50,027	38,246	46,227	0	84	-8	50,242
Sep-05	48,523	39,076	46,004	-2	83	-12	52,042
Aug-05	48,872	41,816	46,824	0	85	-15	55,361
Jul-05	50,279	39,719	46,873	3	85	-15	55,308
Jun-05	48,544	36,474	45,325	0	82	-6	47,987
May-05	50,365	36,020	45,274	-3	82	6	42,864
Apr-05	50,845	36,667	46,591	1	84	4	44,690
Mar-05	49,626	38,266	45,961	7	83	16	39,619
Feb-05	46,571	33,780	42,917	12	78	15	37,307
Jan-05	43,344	29,620	38,474	-16	69	25	30,662
Dec-04	49,146	37,992	45,548	-3	82		
Nov-04	50,311	38,106	47,047	-6	85		
Oct-04	52,887	44,686	50,242	-3	91		
Sep-04	53,604	47,745	52,041	-6	94		
Aug-04	56,855	52,225	55,362	0	100		
Jul-04	58,340	47,896	55,308	15	100		
Jun-04	50,414	41,311	47,986	12	87		
May-04	46,924	36,436	42,862	-4	77		
Apr-04	47,247	39,575	44,689	13	81		
Mar-04	41,880	33,120	39,620	6	72		
Feb-04	40,304	30,648	37,308	22	67		
Jan-04	32,763	26,249	30,662		55		

Dale (2006) offered the following comments on the findings of the initial Highways Agency review:

"In July 2004 the Department for Transport published the first three-month analysis of traffic levels on the M6 Toll and surrounding roads.[164] Traffic figures show that on average 45,000 vehicles a day are using the M6 Toll, and this figure continues to increase.[165] There have

been time savings for travellers who use the M6 Toll. Taking the journey times on M6 Toll and on the M6 before opening, the average weekday journey time savings are 12 minutes northbound and seven minutes southbound. However, maximum time savings of around 30 minutes are shown in the peak hours for a midweek day. On Fridays, some journeys are now up to 70 minutes faster on the M6 Toll than on the M6 before December 2003. Travellers who continue to use the M6 have also benefited from the M6 Toll, since the transfer of traffic has reduced weekday traffic volumes on the M6 itself by 10%, and there are greater reductions at the weekends.[166] This has produced journey time improvements on the M6 of 16 minutes on weekdays, and up to an hour on Fridays."

Transport Select Committee (Seventh Report, March 2005) noted:

"The M6 Toll may have improved journey times but it has also generated extra traffic in the region. The number of vehicles on the M6 corridor increased from 144,000 in November 2003 before the M6 Toll opened, to 160,000 in November 2004.[167] Congestion has developed at either end of the M6 Toll where it converges with the motorway network.[168] The Highways Agency told us that congestion had been apparent at the southern end of the M6 Toll since the road opened because of substantial amounts of traffic wishing to go down a two lane facility to reach the M42. The Agency is currently in discussion with Midlands Expressway Limited about how to improve traffic flow where the M42 diverges from the M6 Toll, by using the hard shoulder and narrower lanes."

Source: www.parliament.uk

Information from the Highways Agency raises questions about the targets, if any, set by the Department for Transport for use of the M6 Toll. Figures published in 1993 show projections based on the year 2011 of between 36,500 and 54,500 vehicles a day using the toll road.

Harrison (2005) identified the following gains to drivers using the M6 Toll:

"Journey time reductions by using toll road and alternative free road:

- Additional time saving achieved by using the M6 Toll is ten minutes;
  - 12 minutes north (average);
  - seven minutes south (average);
- Maximum time savings of approximately 30 minutes on the M6 Toll in peak hours for a mid-week day;
- Reduced variability in travel time;
  - M6 varies significantly depending on day and time of day;
  - M6 Toll constant at 34 minutes;
- Produced reductions on parallel sections of the M6;
  - Weekday reductions are 10%;
  - 15% on Saturday;
  - 20% on Sunday."

Source: Harrison (2005).

Highways Agency Statement: M6 Toll - Post Opening Evaluation

HIGHWAYS AGENCY News Release (N 062-05) issued by the Government News Network on 2 October 2005

The Highways Agency has published a report into the impacts of the opening of the M6 Toll motorway, near Birmingham, looking at traffic volume changes on key routes in the area, as well as journey times, congestion and accidents.

The report found that traffic growth on the M6 Toll has been substantially higher than the national average for motorways. The first full month after opening (January 2004), showed a daily number of workday users' trips of 33,000 on the M6 Toll. In the first three months, this increased by 28%.

The bypassed sections of the M6, which include the busiest sections of the whole road, showed reduced traffic volumes in 2004 and one year on these reductions have been maintained. However, the M6 north and south of the tie-ins of the M6 Toll showed traffic growth about the national average.

There have been reduced traffic volumes on the A50 and the A5, which are used as strategic alternative routes to the M6.

Traffic re-routing onto the M6 Toll is predominantly light vehicles. The proportion of HGVs at the tie-in sections of the M6 Toll is shown to be 7%, whereas on bypassed sections of the M6 it is around 30%.

Journey times using the M6 Toll between J4 and J12 of the M6 are up to 37 minutes faster than that on the M6 before opening.

For users of the bypassed section of the M6, peak period journey times and speeds improved after the opening of the M6 Toll, and one year later these improvements have largely been sustained.

Data from satellite-tracked vehicles shows that roughly 30-40% of vehicles making through trips between J3 and J12 of the M6 use the M6 Toll. However these are predominantly fleet vehicles and may not make choices representative of all motorway users.

In the first year after the opening of the M6 Toll the number of personal injury accidents on the bypassed section of the M6 reduced significantly. The number of accidents where someone was killed or seriously injured was reduced by over a half, compared to the late 1990s.

The M6 Toll has a good safety record in its first year - the accident rate is less than half the national average for a motorway.

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