



Quality Marking Services Limited

www.qmarkings.co.uk



 **HyperLine**TM
the way to a brighter future

Case Study A50 DBFO Network

January 2016

INTRODUCTION

QMS HyperLine™ is a high performance road marking system used for the over-marking and rejuvenation of existing delineation on arterial networks.

Utilising a combination of solvent free acrylic resin containing no plastic plus two specific sizes of glass beads, **QMS HyperLine™** provides instant retro-reflectivity on application, significantly improving day and night time visibility for the road user.

On application **QMS HyperLine™** achieves over 500 mcd/m²/lux. Throughout the functional life of the system, the retro-reflectivity is guaranteed to exceed contract specification.

This case study explores the application and performance of **QMS HyperLine™** on the A50 dual carriageway (Area 28) where the system has been in use since 2005.

In 2006, the network adopted **QMS LifeLine™**, a risk managed, road marking maintenance solution, which evidences the outstanding performance and enduring retro-reflectivity of the **QMS HyperLine™** system.

HyperLine™ products have received independent industry recognition: **HyperLine™** won the Highways Magazine Excellence Awards (HMEA) Product of the Year in 2009, **HyperLine™ ULTRA** won the RSMA's Road Marking Innovation of the Year 2016 and the **LifeLine™** service was awarded Highly Commended in the HMEA 2015 Project of the Year category.



CONTRACT REQUIREMENT & IMPLEMENTATION

The Area 28 DBFO contract on the A50 encompasses 110 kilometres of dual carriageway between the M1 (Area 7) and the M6 (Area 9).

This stretch of dual carriageway is exceptionally busy, carrying high volumes of commuter and commercial traffic. The client, Connect Roads, required a solution that would ensure the road markings on the network were always within specification and that the highest level of road safety performance was assured whilst continuously delivering sustainable value both in terms of cost and environmental performance.

In 2003 QMS approached Balfour Beatty (the Operator) with our newly developed **HyperLine™** and with the agreement of Connect Roads (the Client) were invited to trial along the A50 network.

Over the next 24 months the system continued to display remarkable retro-reflectivity levels, demonstrating exceptional clarity to road users at night and in the wet, times which are notorious for poor visibility. After 2 years of favourable trials **QMS HyperLine™** was fully implemented along the length of the A50 in 2005

PERFORMANCE EVIDENCE

In 2006, following the success of **HyperLine™** Quality Marking Services proposed the option of the **LifeLine™** package which is a complete service for road marking maintenance to Balfour Beatty and Connect Roads.

The **QMS LifeLine™** service offers a fully risk managed solution to the maintenance of road markings along arterial networks, providing conformity to both BS EN 1436 and TD26 plus ensuring 100% compliance with the contract specification on the network.

Using high speed retro-reflectivity surveys to determine the condition of the road markings, **QMS LifeLine™** highlights the segments of carriageway which require refreshing. The works can then be proactively scheduled for treatment with **QMS HyperLine™** to rejuvenate the road markings guaranteeing that the network never falls below the minimum retro-reflectivity specification.

Balfour Beatty and Connect Roads fully adopted the **QMS LifeLine™** concept and incorporated it into their programme.

One element of the A50 contract includes an annual assessment of road markings. A reflectivity survey on the condition of the road markings throughout the entire network is undertaken to determine the condition of the **QMS HyperLine™** treatment from the previous year.

The initial assessment allowed for the forecasting of refresh works over three seasons utilising **QMS HyperLine™** and then maintaining the required levels of retro-reflectivity over two years.

Following each year's road marking programme, reflectivity surveys confirm compliance and demonstrate that previously completed works continue to perform at, or above, the levels required.

In 2011, following five years of monitoring and rejuvenation of the **QMS HyperLine™** road markings, reflectivity surveys confirmed the majority of road markings exceeded 200 mcd/m²/lux – double the minimum specification requirement.

This confirmation of performance plus the experience and knowledge gained from the previous five years, permitted an extension of the **QMS LifeLine™** concept to be implemented from 2012.

Quality Marking Services Limited have been able to reduce annual expenditure to a figure substantially lower than in 2006.



“The adoption of QMS LifeLine™ on the A50 has enabled Quality Marking Services Limited to evidence the retro-reflectivity levels and cost benefits of the QMS HyperLine™ system on a busy arterial network over a 10 year period.”

Greg Clark, QMS Managing Director

SAFETY & ENVIRONMENTAL BENEFITS

High performance line markings are proven to deliver considerable safety benefits to road users, especially during wet night conditions.

Data analysis demonstrates that in 2005, prior to the installation of **QMS HyperLine™**, there were ten serious and three fatal incidents on the A50*.

Following the adoption of **HyperLine™** in 2005, incident statistics demonstrated a gradual decline over the seven year period to 2013* reducing the number of serious incidents to five with one fatality.

Comparison of 2005 to 2013 has resulted in a 50% decrease in serious incidents and a 67% reduction in fatalities*.

Although the reduction of road traffic incidents cannot be solely correlated to the replacement of road markings, the strategic approach in utilising a high performance road marking solution has been the single and largest safety improvement scheme on the network. Therefore, it is reasonable to attribute a significant proportion of the incident

reduction to the implementation of the **QMS HyperLine™** system on the A50 network.

*Full 2005-2013 details are available on www.crashmap.co.uk

QMS HyperLine™ is applied at ambient temperature which means that the risk of burns associated with using molten thermoplastic material plus the additional danger of accidents from hot plant are completely eliminated. This innovative solution also provides a significant reduction in carbon emissions as there is no requirement for material or machinery to be heated to temperatures exceeding 200°C prior to application.

QMS HyperLine™ is cold applied and solvent free containing no plastic ensuring that road markings can be refreshed quickly and safely.

QMS HyperLine™ works on the A50 are mainly undertaken utilising mobile traffic management removing the requirement for operatives to be on foot on the live carriageway.

The advantage of reducing road space occupancy by over 75% enables travel on the network to continue with minimal disruption and brings significant benefit to road users and maintainers.

When compared to hot applied thermoplastic, the use of **QMS HyperLine™** produces a calculated saving of 3,179g of carbon dioxide (CO₂) per m² of road marking applied.

2005 - 2015 since the implementation of the **QMS LifeLine™** concept on the Area 28 A50 DBFO network, CO₂ consumption



has been reduced by 226 tonnes through the delivery of 71,126m² of **QMS HyperLine™**.

Although 226 tonnes is a huge saving, the overall reduction of CO₂ is believed to be far greater as the figures above do not take into account the additional reduction in emissions from less traffic management and the elimination of return visits.

By adopting the **QMS LifeLine™** concept, Connect Roads and Balfour Beatty have dramatically reduced their environmental impact by proactively sourcing a strategic approach to the delivery of road marking maintenance.

PROJECT INFORMATION

Each year, Quality Marking Services Limited meets with Balfour Beatty and Connect Roads to assess the condition of road markings on the A50. The annual retro-reflectivity survey pro-actively details segments of the network where the road markings are likely to fall below the minimum standard over the coming months.

As the A50 is a dual carriageway, the survey registers the condition of the nearside edge line, the centreline and the offside edge line. Reflectivity readings are taken every 300mm with the average road marking performance registered every 100m.

The results of these surveys have provided Balfour Beatty and Connect Roads with a strategic foundation for future planned maintenance along the A50, ensuring that the network road markings never fall below the minimum standard at any time

QUALITY

The material manufacturer of the acrylic resin has supported Quality Marking Services throughout the delivery of **QMS HyperLine™** on the A50 by ensuring that every batch of this unique formula is produced to a consistently high quality resulting in zero failures.

The glass beads utilised within the **QMS HyperLine™** system are manufactured to a specific size and dimension. This ensures correct embedment and adhesion within the acrylic resin and provides the optimum level of retro-reflectivity throughout the functional life of the marking.

The majority of glass beads are recycled, produced from waste otherwise destined for landfill and contributing to sustainability.

The rigorous testing at the respective manufacturing plants guarantees consistency of the materials provided and an assurance to the customer that the end product will perform exactly as expected.

The **QMS LifeLine™** concept passes the risk management in product performance completely onto Quality Marking Services Limited.

Initial savings in application cost in addition to the elimination of any return visits to replenish failed road markings makes the use of the **HyperLine™** system within the **QMS LifeLine™** concept the most cost effective solution for road marking available in the market.



CLIENT ENDORSEMENT

Balfour Beatty Civil Engineering

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Dear Greg

The lining on a carriageway is an important safety measure and is a key component to allowing the public to safely use a network. We have been working with QMS for a number of years using their Hyperline/Lifeline process.

The initial driver was that the water based hyperline material could be laid quickly over existing lines using mobile closure techniques to give an immediate and efficient "refresh".

After using the material for some years, we entered discussions with QMS regarding a longer term proactive management of road markings. With Lifeline, QMS carry out surveys and inspections, identifying areas that should be refreshed to maintain roadmarkings to the required standard. This ensures the reflectivity of our roadmarkings is maintained and enables us to proactively plan our interventions for when it is convenient, rather than on a more reactive basis.

Over the 8 years we have been working with QMS on the A50, Lifeline/Hyperline has reduced the amount of roadmarking we have to carry out, enabling us to maintain a high standard of roadmarking on our network whilst also contributing to both road-worker and road-user safety.

Yours sincerely,



David May
DBFO Projects – Contract Director



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We have used the QMS Lifeline™ concept on the A50 Derby Southern By Pass DBFO Contract since 2006.

The risk management facility of the concept has ensured the road markings on the network are compliant at all times through annual inspections and monitoring of sections due for refurbishment.

We are completely satisfied with the outcome.

The concept incorporates the QMS HyperLine™ system that has kept our road markings fresh and within specification year on year with the minimum of fuss.

This has meant that we have no concerns regarding the serviceability of our route and the peace of mind that comes with knowing we comply with our contract requirements, thereby ensuring that the travelling public remain as safe as the road markings can make them.

QMS have always acted professionally and understand our needs and aspirations. We are happy to endorse both the QMS LifeLine™ concept and the company for the Highways Magazine Excellence Awards 2015.



David Groves
Regional Operations Manager
Connect A50 Limited.

QMS

QUALITY MARKING SERVICES LTD

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