

UK-22 Tunnels Improvement Programme

Overview

The A55 strategic road, situated in the north of Wales, United Kingdom, forms part of the TEN-T network Route E22. It carries inter-urban traffic from the UK and mainland Europe to and from Ireland, via the port situated at Holyhead. Many parts of the road are also used for commuting local traffic as well as seasonal traffic.

The A55 Tunnels (Conwy, Penmaenbach and Pen-y-clip) are situated in close proximity with each other along the route, close to the towns of Conwy and Llandudno. They carry up to 32,000 vehicles per day and are critical to the efficient mass movement of road traffic along the A55 route. The Penmaenbach and Pen-y-clip tunnels opened in 1989 and Conwy in 1991.

The A55 Tunnels Improvement Programme encompasses a range of different projects, which have given rise to the need for implementing ITS projects, alongside a range of other safety critical works. The projects involved were: Implementation of a North Wales Traffic Management System (NWTMS), Upgrade of Conwy Tunnel Generators, Conwy Tunnel Sump Improvements, Installation of a New Generator at Penmaenbach and Free Text VMS Improvements.

Objectives

General background

Many of the original Mechanical and Electrical systems were still in place within the tunnels and had become life-expired; becoming more expensive, requiring more frequent and timely maintenance year on year.

Access to undertake this maintenance caused ever increasing disruption to road users and these assets required replacement/upgrade to guarantee tunnel resilience for the next 20 years and to ensure compliance with the EU Directive 2004/54/EC on minimum safety requirements for tunnels on the trans-European road network.

As a result, there were a number of significant risks associated with the current life expired systems in use throughout the A55 Tunnels and their non-compliance with EU and UK legislation. Tunnel users would be adversely affected should any of the tunnels be unavailable in the event of a major fault, incident or accident, which causes an unplanned closure of any of the tunnels.

Improvements to the Tunnels will provide benefits of reductions in the number of collisions, improvements to the detection and management of incidents and improvements in traffic flow. Improvements also increase both user and maintenance worker safety, along with reduced vehicle emissions due to reductions in congestion.

Project description

This programme involved several projects (see above), the main ones were:

- i. North Wales Traffic Management System

The North Wales Traffic Management System (NWTMS) was implemented due to the numerous, individual systems

previously used by operators to manage incidents and planned maintenance. Combining these eight systems into one, ensured that operational and/or emergency procedures can be promptly implemented with a reduced level of risk. This involved the upgrade of several systems similar to existing SCADA systems.

- ii. Message Signs

The other main project involved in this programme was the upgrade of the post mounted VMS signs on the approaches to the Tunnels. This was due to the VMS being in place since 2001 and being unable to provide the necessary traveller information, that could be displayed on new type signs. Therefore, the public were not being fully informed about incidents, planned or unplanned, which increased the risk of further incidents happening. By upgrading the systems to comply with EU ITS guidelines, they will improve network resilience, reduce revenue costs and reductions in system failure issues.

Member States involved:

Welsh Government – United Kingdom

Implementation schedule

Start date: April 2015

End date: April 2017

Budget

Total project cost covered by this Decision:

1.965m€

EU contribution:

0.393m €

Percentage of EU support:

20%

Results expected

By implementing these projects, they provide EU/UK compliance together with additional interventions shown to cost-effectively address remaining risks in terms of the safety of users, the resilience of the route, the reliability of the tunnel systems, as well as environmental risks.

The main benefits from the programme will include:

- Additional fire protection for the Conwy Tunnel structure;
- Reduction in the number of collisions and associated casualties in the tunnels;
- Detection and management of incidents;
- The potential for vehicles to enter the tunnel during incidents will be reduced;
- Improvements in evacuation resulting from major collision or fire events;
- Replacement systems will be more reliable and cheaper to operate;
- The resilience of the A55 route will be improved through reduced short-term tunnel closures and the lower probability of long-term closures following major incidents;
- Provision of a long-term benefit to the Welsh economy.

The table below represents the predicted safety accident savings over a 60-year appraisal, resulting from implementing this programmes objectives.

Table 1 : Safety appraisal summary

Item	Predicted Number	TOTAL
Fatalities at 2.068m €	67.5	139.59m €
Serious Injury at 0.237m €	8.5	2.02m €
Slight Injury at 0.025m €	111	2.81m €
Total Benefits (€)		158.17m €

Geographical Location



Figure 1 : Map showing the location of Wales and the area where these projects took place

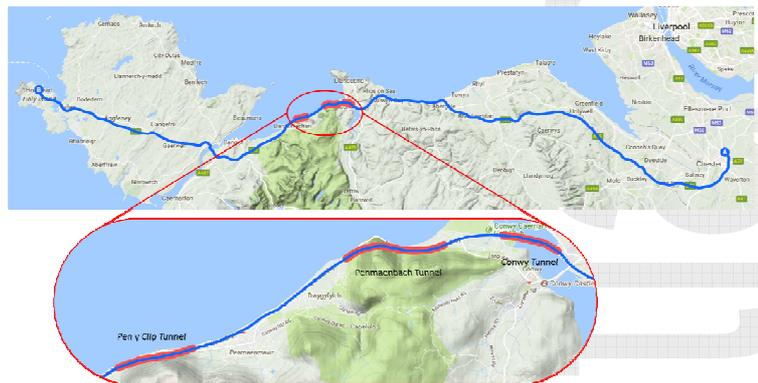


Figure 2 : Map of A55 showing all three tunnel locations

Contact People

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