

Cabinet

18th March 2015



A690 Milburngate Bridge - Major Maintenance

Report of Corporate Management Team

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Purpose of the Report

- 1 To inform Cabinet of the proposals to undertake major maintenance of Milburngate Bridge and the implications this will have on the highway network.

Background

- 2 Milburngate Bridge carries the A690 over the River Wear within the City of Durham. The A690 over the bridge is the most heavily trafficked non-trunk road in County Durham carrying an average daily traffic flow of approximately 48,000 vehicles. This includes local traffic in addition to east to west through traffic. Milburngate Bridge is a key strategic structure for the transport network.
- 3 The bridge was constructed in 1967 by Holst and Company as part of a bypass to relieve traffic congestion within the city centre. Further works were undertaken in 1989 to increase the number of traffic lanes from three to four.
- 4 In 1996 Milburngate Bridge underwent a major refurbishment scheme. This included:
 - Removal and replacement of the existing surface and waterproofing system
 - Installation of a new subsurface drainage system
 - Replacement of the original cast iron drainage pipes within the bridge with polyethylene pipes

This refurbishment scheme did not include the resurfacing of footways.

- 5 In 2013 it was noted that the carriageway movement joints on the bridge had failed and could be seen to be moving under heavy wheel loads. However this should not be misinterpreted that the bridge is not safe for vehicles to cross. The bridge is safe and the proposed work is routine maintenance. The

carriageway drainage channels on either side of the road have also been identified as beyond economic repair.

- 6 Detailed inspections have been carried out which have confirmed that the following maintenance works are required:-
 - Drainage system
 - Parapets
 - Surfacing
 - Concrete repairs
- 7 It should also be noted that the deck waterproofing has a service life of approximately 20 years. The existing system is approaching this 20 year limit. It is therefore proposed to replace this system as part of the maintenance scheme to minimise any further disruption in Durham City.
- 8 Once these maintenance works are complete the bridge should not require any major maintenance for approximately 15 to 20 years.

Options and Implications

- 9 A major maintenance scheme is currently being prepared for this financial year with a view to undertaking the works during the summer. These works will address the issues identified above and ensure the ongoing serviceability of this key strategic structure.
- 10 A number of meetings have been held between officers of Neighbourhood Services, Regeneration & Economic Development and Durham Constabulary to discuss possible options and the potential impact on the road network in and around Durham City during the works.
- 11 The options considered were then modelled by the Strategic Traffic team to determine the impact on traffic flows around the city. This enabled Highway Services to further develop the proposals to determine the implications of the works and the estimated durations for each option.
- 12 It is considered that regardless of which option is considered to be the least disruptive, there will still be a significant impact on traffic flows in and around Durham City.
- 13 The timescales identified in the options below are initial indicative figures based on modelling and scheme development work undertaken by both Strategic Traffic and Highway Services.

Option 1: Full Closure (inc. footways) - Estimated Duration 27 days

- 14 The works would be carried out under a full closure of the bridge for both vehicles and pedestrians. A full diversion route would need to be identified for traffic travelling in both directions.

Works Implications

- 15 The advantages of this option are:
- Shortest duration of disruption (27 days) with maximum scope for slippage due to weather. Completion would be within the 6 weeks school holidays
 - Most cost effective option
 - Safer to have one work area without moving traffic.
- 16 The disadvantages are:
- No vehicular or pedestrian access across the bridge.

Traffic Flow Implications

- 17 A modelling exercise was undertaken for the full closure scenario contained within the school holidays to assess the impact on traffic flows around the city. The modelling exercise considered the morning and afternoon peak times (07.00 am to 10.30 am hours and 3.15 pm to 7.15 pm) with the issues identified below:
- The city highway network would be severely congested with excessive queuing on all routes due to traffic volumes and conflicts at critical locations (including high traffic volumes and HGVs on unsuitable alternative routes e.g. Margery Lane, Church Street and Hallgarth Street)
 - Major approaches to the city (A167, A690, A177 and A183) would be severely congested with excessive queuing and delays
 - The morning peak journey times initially range from an average of 45 to 58 minutes on most routes and up to a maximum of 1 hour 30 minutes to 2 hours on some
 - From approximately 9.30 am the city road network becomes severely congested. From that point forward actual journey times are unknown but exceed 55 minutes. Thereafter congested conditions continue for an unknown period
 - The afternoon peak journey times initially range from an average of 30 to 53 minutes on most routes and up to a maximum of 1 hour and 20 minutes to 1 hour and 52 minutes on some. The exception to this is on the A181 Sherburn House to A690 Stonebridge Roundabout journey which averages 1 hour and 52 minutes up to a maximum of 2 hours and 36 minutes
 - From 4.55 pm the city road network becomes severely congested westbound. From that point forward actual journey times are unknown but exceed 2 hours and 20 minutes
 - From approximately 6.04 pm the city road network becomes severely congested eastbound. From that point forward actual journey times are unknown but exceed 1 hour and 10 minutes. Thereafter congested conditions continue for an unknown period
 - The slightest incident on any route would cause gridlock.
- 18 Durham Constabulary and Strategic Traffic have confirmed that this option is not acceptable.

Option 2: One Lane Open Eastbound - Estimated Duration 40 days

- 19 Following an initial traffic modelling exercise based on school holiday traffic flows, in addition to a 75% reduction of A690 through traffic (high level estimate) the option to maintain one lane open in a westbound direction was dismissed. This being due to diverted eastbound traffic conflicting with westbound traffic at Leazes Bowl and having to give way causing extensive delays and queues.
- 20 This option requires the work to be undertaken in a number of phases and would require a diversion route to be identified for traffic travelling in the westbound direction. Due to potential delays in the open eastbound direction it is inevitable that some drivers will use alternative routes in order to try and avoid the disruption.

Works Implications

- 21 The advantages are:
- Allows one lane of traffic to be maintained eastbound throughout the works
 - One pedestrian route maintained at all times
- 22 The disadvantages are:
- Estimated duration 40 days
 - Restricted workspace during some phases of the work results in minimal options for multitask activities
 - Only allows for two days slippage in programme to undertake work in school holiday period
 - A number of full road closures will be required due to phasing of the works and the need to switch traffic management arrangements. This would only be carried out overnight
 - Due to the necessary phasing of the works it is more likely that the weather dependent activities are affected twice thus increasing the possibility of delays.

Traffic Flow Implications

- 23 A traffic modelling exercise for the one lane open eastbound scenario was undertaken. This was based on school holiday traffic flows in addition to a 75% reduction of A690 through traffic. This was a high level estimate based on the assumption that some drivers would choose to avoid the city centre. A summary of the impact is given below:
- Extensive traffic management and temporary works required at several locations around the city to accommodate diverted traffic
 - Huge increase in traffic on unsuitable routes e.g. Margery Lane increases from 210 vehicles two-way peak hour flow to 1115
 - Westbound traffic could run via Claypath to turn right un-opposed at Leazes Bowl which would exacerbate westbound queuing at Leazes Bowl and delay eastbound traffic at Leazes Bowl and Gilesgate roundabouts

- Existing traffic signals cycle times would need increasing to 180 seconds which will delay pedestrians to a level whereby they would probably take risks
 - Incidents (e.g. collisions, breakdowns and deliveries) on diversion routes would rapidly cause serious congestion and 'lock up' the city
- 24 Durham Constabulary and Strategic Traffic have confirmed that whilst this option is acceptable, it is not their preferred option.

Option 3: One Lane Open in Each Direction - Estimated Duration 43 days

- 25 This requires the works to be undertaken in a number of phases. Although the bridge will remain open in both directions there will still potentially be delays in crossing the bridge. It is therefore anticipated that some drivers will use alternative routes in order to try and avoid any disruption.

Works Implications

- 26 The advantages are:
- At least one footpath to remain open at all times throughout the works
 - Vehicle access across the bridge maintained in both directions.
- 27 The disadvantages are:
- Estimated duration 43 days
 - Does not allow for any slippage in programme to undertake work in the school holiday period. Any slippage in the programme could result in work continuing into school term time.
 - Due to restricted space site access become linear (one way in/out) which hinders resource/productivity/access and does not allow multi-task activities
 - A number of full road closures will be required due to phasing of the works and the need to switch traffic management arrangements. This would only be carried out overnight

Traffic Flow Implications

- 28 A traffic modelling exercise was undertaken for the one lane open in each direction scenario with traffic flows assumed to be at school holiday level with no reduction in through traffic.
- 29 The modelling of this scenario also made a number of assumptions relating to the traffic management proposals for vehicles entering and exiting the works at both the east and west end of the bridge.
- 30 Should these assumptions not be realised in practice, delays and congestion will be worse than predicted.

- 31 Highway Services have confirmed that the assumptions can be accommodated within the works. A summary of the impact of this option is given below:
- Relatively small increase in traffic flows and journey times on some alternative routes when compared to school term levels but also shows a decrease on others
 - Although the example journey times resulting from the modelling exercise for this option are similar to school term time, higher traffic flows than normal are predicted on some routes
 - Although the journey times may appear acceptable, it is possible that other problems could occur due to higher traffic flow on 'unsuitable' routes, particularly where parking and/or delivery vehicles could impede flow. An audit is to be carried out on such routes to identify potential problems and solutions
 - Pedestrians may also encounter difficulty crossing some roads where flows increase although measures will be put in place to manage this
 - Traffic from Milburngate can queue across Leazes Bowl roundabout at times and block the Elvet approach
 - This option is not expected to require engineering works elsewhere on the city highway network. Any potential problems identified by the proposed audit could probably be achieved by amending TROs and/or suspending parking/deliveries etc. rather than by physical works
 - There will still be a considerable amount of work involved for the Traffic Signal Team to amend timings at traffic signal junctions and crossings around the city in order to mitigate the effects of changed (and changing) traffic patterns and flows. Signals operation will also need to be closely monitored throughout the project.
- 32 Durham Constabulary and Strategic Traffic have confirmed that this scenario is their preferred option.

Preferred Option

- 33 A joint meeting with Durham Constabulary was held on 10th December 2014 to discuss the above options and potential impact on the road network in and around Durham City during the works.
- 34 Due to the minimal saving in programme duration (3 days) of Option 2 in comparison to maintaining one lane in each direction, it was agreed that the preferred option was Option 3.
- 35 Whilst it is considered that keeping one lane open in each direction will have the least impact on the city, it should be noted that this option is still likely to cause major disruption in and around Durham City which will require significant management. A number of issues will need to be addressed in the ongoing development of the project and possible mitigation measures put in place to try and reduce the potential disruption.

Communications

- 36 Effective communication will be required with all stakeholders during development of the scheme including the wider community and road users. This will include regular press releases, advance warning signs, leaflets and posters informing of the proposals in advance of starting works. This communication campaign will emphasise that this work is essential maintenance and that road users should only travel through Durham City if absolutely necessary. Anyone travelling into Durham should consider using alternative forms of transport including Park and Ride.
- 37 Stakeholders that will be informed include:
- Durham County Councillors
 - Emergency Services: Routes to and from North Durham University Hospital to be maintained. This may require repositioning of emergency vehicles
 - Prison Service: Prison transfer routes may be affected
 - Network Rail
 - Highways Agency
 - Durham University
 - Dean and Chapter
 - Local businesses
 - Public transport
 - Taxi services
- 38 A Communications Plan is being developed by the Project Manager working with the Council's communications team. This includes a webcam so the public can monitor progress and regular social media updates to keep the public informed as the work progresses. These messages will explain any perceived inactivity such as when newly laid concrete needs to cure.

Mitigation Measures

- 39 In order to mitigate the impact on the road network during the works the following mitigation measures will be implemented:
- Works to other areas of the network (e.g. parking restrictions, amending traffic regulation orders, additional traffic management etc.) to improve traffic movement around the city. The extent of these works will be identified following the completion of the audit of alternative unsuitable routes identified previously although it is not considered that any engineering works will be required. This work is to be undertaken by Strategic Traffic
 - Changes to existing traffic signal timings to improve the traffic flow around the City. This is to be identified in conjunction with the above audit
 - Traffic Management Company to be available 24 hours to respond to any emergencies
 - Emergency recovery vehicles situated around the city to respond to any incidents

- 40 A dedicated Project Manager has been appointed from the Construction Project Programme Management Unit to manage the project and coordinate all associated activities.

Timing and Impact on other proposed Works/Developments within Durham City

- 41 It is proposed to start the works on Sunday, 12th July 2015, (following the Miners Gala) with an estimated completion date of Sunday, 30th August 2015. The week in advance of the summer school holidays has been included in the works programme to allow for any potential slippage. Strategic Traffic has indicated that traffic flows reduce in the weeks running up to the school holidays.
- 42 A number of other major projects are currently planned within Durham City and the surrounding area during the summer of 2015 which could potentially conflict with the proposed bridge works and resulting traffic implications. These include proposals for Sunderland Bridge Roundabout, SCOOT and Durham Bus Station. Due to the requirement of undertaking the works to Milburngate Bridge during the school holiday period all other works will be programmed around the bridge works to ensure conflict does not occur.
- 43 Due to potential future works/developments within Durham City, Regeneration & Economic Development have indicated that the summer of 2015 is the optimum time to carry out the necessary works to Milburngate Bridge.
- 44 All other planned maintenance/utility works within Durham City and its surrounding area would be programmed to ensure that further disruption to the highway network does not occur during the bridge works.
- 45 One issue to note is that a recent inspection has potentially identified that works may be required to Claypath Bridge in 2015. A detailed survey and assessment is to be undertaken to determine the full extent of the works. If it is feasible, these works will be carried out concurrently with the Milburngate Bridge works to avoid further disruption in the future.

Potential Risks

- 46 There are a number of potential risks associated with undertaking this work which could cause delays and extend the closure resulting in continued disruption to the network. These include:
- Concrete deck surface in poorer condition than anticipated. Extensive concrete repairs required with associated increase in scheme cost and programme. A ground survey has been undertaken to identify the extent of concrete repairs to buried deck surfaces which indicates that the concrete deck is in acceptable condition but this cannot be guaranteed until the surfacing is removed
 - Poor weather during the works causing delays to a number of activities (concrete repairs, waterproofing, surfacing). Working methods and

Appendix 1: Implications

Finance

As contained within the report.

Staffing

Delivery of the scheme is to be undertaken by Highway Services.

Risk

As contained within the report.

Equality and Diversity / Public Sector Equality Duty

None.

Accommodation

None.

Crime and Disorder

None.

Human Rights

None.

Consultation

None.

Procurement

Design and construction to be delivered by Durham County Council.

Disability Issues

Need to ensure pedestrian diversion routes are DDA compliant.

Legal Implications

As contained within the report.