

## Appendix D: Network management impacts and mitigations

### Strategic context

As noted in the Report, the scheme aims to transform city centre streets and improve facilities for pedestrians and cycle users. This contributes to the realisation of the Connecting Leeds Transport Strategy, Vision Zero and the three pillars of the Best Council Ambition. The impacts set out in this appendix have been balanced against the transformational benefits to be delivered by the scheme.

The scheme reduces the number of lanes across much of the scope and makes changes to junction layouts. The reduction in the number of traffic lanes has network management implications, which are summarised in this appendix.

### Normal network operation

Extensive local junction and microsimulation modelling has been undertaken and officers are satisfied that these changes will not adversely affect the operation of the network, during normal day-to-day working, including in the peak periods. All junctions are forecast to operate efficiently. Officers in UTMC have been closely involved in the design of the signalised junctions in the scheme and they are satisfied with this analysis and the modelling results.

### Data from recent network operation

One lane operation has been implemented on a permanent or temporary basis on several parts of the scheme scope, which supports the modelling outputs and gives officers confidence that the reduction to one lane will not be detrimental to the day-to-day operation of the network, both during normal operation and when incidents occur.

- Merrion Street, east of Wade Lane, has operated as one lane since September 2021.
- The entire southern corridor has operated as one lane since September 2022.
- For several weeks during 2023, Great George Street operated as one lane between Calverley Street and Woodhouse Lane.

There are also precedents for one-lane operation in the city centre on Crown Point Road, Kirkgate, Call Lane and Clay Pit Lane, where no significant issues have arisen for network management.

### Stress testing using modelling

Microsimulation modelling has also been used to assess the impact of the scheme on network performance under various scenarios when parts of the Inner Ring Road are unexpectedly closed. This stress testing simulated the impact of a vehicle breakdown, or other disturbance, which leads to a reduction of Inner Ring Road capacity for both short and long durations. These assessments indicated that the impact of the scheme on the network during such scenarios is acceptable.

### Network management during planned works

It should be noted that the reduction in carriageway width to one lane across most of the scheme extents will increase the *likelihood* that segments of the route may need to be closed to motor vehicles on a temporary basis when parts of the carriageway need to be occupied to enable utilities works or adjacent development works or to carry out road maintenance. Similarly, the reduction in carriageway width may mean that works can currently be delivered during the day with suitable traffic management may, need to take place at night, at weekends or during times of reduced traffic (such school holidays), with the associated impact on cost and amenity. However, the scheme does

not guarantee that such works, or incidents such as vehicle breakdowns, will require the closure of the carriageway, as this will depend on the nature of the works or the incident. Lay-bys (which have been retained across both corridors) and side roads will provide additional width for vehicles to pass, and two lanes have been retained on certain sections.

Officers have investigated in detail the diversion routes that would be required should segments of the route need to be closed to motor vehicles facilitate planned utilities or development work. A series of diversion routes have been devised that would in principle maintain local access and allow through traffic to be sign-posted to appropriate alternative route. Physical changes have been made to the scheme to facilitate the delivery of these diversion routes when required, giving officers confidence that the diversion routes are feasible. Some of these diversion routes are more complex, for example involving the reversal of direction, and some of these will require a Temporary Traffic Regulation Order and changes to the operation of signalised junctions. Officers from UTMC are content that these changes to signalised junctions could be implemented satisfactorily. In addition, complex signing and extensive advanced signing for some diversions.

Pre-prepared traffic management plans and infrastructure is considered necessary in some cases, and the resources of operational teams will need to be drawn upon, so that diversions can be implemented promptly when needed. Highways Maintenance officers have been consulted on these requirements. Due to these requirements, these diversion plans will be suitable for planned works and unplanned works of a long duration. For short duration works, or urgent work (such as utility defects) it would not be practical to implement the pre-planned traffic management plans.

Going forward, officers will undertake further to develop more detailed diversion route plans.

### **Inner Ring Road and M621**

Work to transform the city centre in recent years, including the LPTIP and City Square schemes, have reduced the number of routes available for general traffic resilience during incidents which has increased the city's reliance key strategic routes, especially the Inner Ring Road and M621. To support the city's ongoing ambitions for further city centre transformation, the maintenance and efficient operation of the Inner Ring Road and M621 will be prioritised to minimise disruption. This work has begun, and proposals are being developed to renew assets along this route.

The northern corridor in the scheme (Great George Street and Merrion Street) is currently used as a diversion route when the eastbound carriageway of the Inner Ring Road is closed for maintenance work. Since the Inner Ring Road maintenance work mainly occurs after 7pm, it is judged that the route will have sufficient capacity to accommodate diverted traffic, but the operation of this diversion route will be monitored after the delivery of the scheme.

As an alternative to the existing Great George Street and Merrion Street diversion route, officers are assessing the feasibility of a new eastbound diversion route through Holbeck to be used when the eastbound carriageway of the Inner Road is closed for maintenance. This would mirror the existing westbound diversion route through Holbeck, which has been successfully deployed when the westbound carriageway of the Inner Ring Road is closed for maintenance since September 2022 when the closure of City Square to through traffic necessitated its creation. To facilitate a two-way diversion route through Holbeck for use when the Inner Ring Road is closed, officers are considering the provision of drop-down signs that can be more efficiently deployed than temporary signs.

### **Highway maintenance work**

As detailed above, where the scheme reduces the carriageway to one lane, it will not be possible to undertake future carriageway renewal works (or footway renewal works on the opposite side of the road to the cycle track) without closing the carriageway in the daytime or undertaking work at night. By closing the cycle track, it will be possible to undertake renewal works on the adjacent footway without affecting the carriageway. To mitigate against this impact, several segments of footway and carriageway renewals will be carried out across sections of the scheme length while the scheme is being delivered, which will extend the life of the footways and carriageway. In addition, officers are considering specifying a new type of carriageway material that is more resilient and therefore has a longer life.

### **Construction phase**

During the construction phase, careful consideration will be given to traffic management and buildability issues. This will encompass the significant other traffic management, both committed and planned, in and around the city centre. Contractual arrangements and the scheme budget will allow for appropriate restrictive working.

### **Abnormal Loads Vehicles**

The Abnormal Loads Officer has been consulted on the scheme and the design of the scheme will support abnormal load vehicle requirements in the area. The scheme provides a minimum carriageway width of 4.2m on the the northern corridor and 3.6m on the southern corridor with all vertical obstructions offset from the carriageway by 500mm on both sides in order to cater for abnormal load vehicles.