

Annex 3 Junction & Link Options (Advantages & Disadvantages)

| At Grade Roundabout Improvements | | |
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| Item | Advantages | Disadvantages |
| AG 1 | Limited Land take. Improvements may be possible within existing Highway Boundary at some locations | Capacity limited by size and geometry. Some junctions close to limit of viability. |
| AG 2 | Less visually intrusive than grade separated solution | Adjacent properties possibly more affected by noise, air quality and light pollution due to reduction in separation distance |
| AG 3 | Substantially less expensive than GSJ option | Difficult to build to allow for future grade separation without substantial additional land take and cost. |
| AG 4 | | Queuing likely at peak times. Radial Public Transport Routes affected by orbital flow |
| AG 5 | | Increased emissions due to braking & acceleration on A1237 at roundabouts |
| AG 6 | Lower approach speeds with fewer collisions | Large diameter roundabouts may encourage higher speeds. Potential for rear shunt accidents. |
| AG 7 | | Larger diameter roundabouts lead to higher speeds and greater diversion from desire line for Pedestrians and Cyclists |
| AG 8 | Underpasses to be provided at key roundabouts to reduce severance. | Additional approach and exit lanes will make crossing for non-motorised users more difficult. |
| AG9 | | Removal of existing hedgerows adjacent to roundabouts and for widened approaches and subways (substantially less than grade separated option) |
| Grade Separated Roundabout Improvements | | |
| | Advantages | Disadvantages |
| GS 1 | Increased capacity due to reduced conflict between orbital and radial flows | Substantially larger land take required for slip roads and embankments. Properties at pinch points severely affected (Strensall Rd & A59 in particular). |
| GS 2 | | Very visually intrusive if elevated. Construction. Drainage concerns if excavated underpass. |
| GS 3 | | Substantially more expensive than at grade option (up to 5x) |
| GS 4 | Minimum geometric design could accommodate future traffic growth | 'Spare' capacity may encourage additional car based trips |
| GS 5 | | Full benefits of additional junction capacity only realised if links dualled (Additional cost & environmental impact) |
| GS 6 | Strategic traffic separated from | |

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| | local/radial movements Reduced radial public transport journey times | |
| GS 7 | | Properties further away from junction affected by noise and light pollution |
| GS 8 | Free flow conditions leading to lower emissions | Increased emissions due to gradients |
| GS 9 | Fewer accidents due to removal of conflict positions | Higher speeds could lead to more severe collisions at merge positions |
| GS 10 | | Pedestrian & Cycling facilities more difficult to introduce due to higher speeds and additional slip-road crossings |
| GS11 | | Impact on existing landscape and ecology more significant than at grade solution. |

| <u>Twin Entry/Exits at Roundabouts Merging to Single Carriageway</u> | | |
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| | Advantages | Disadvantages |
| SC 1 | Increases capacity of roundabout to match single lane link capacity | Traffic flows including York Northwest developments exceed the theoretical optimum flow capacity of single lane links. |
| SC 2 | Substantially reduced cost relative to dual carriageway links | Merge lengths mean widened structures required at a number of roundabouts |
| SC 3 | Consistent with Hopgrove Roundabout improvements | Additional merge movements lead to a potential for more safety concerns than dualling option. Consistent approach at all roundabouts would reduce risk. |
| SC 4 | Future upgrade to dual carriageway could be accommodated by joining two lane sections | |
| SC5 | | Removal of existing hedgerows adjacent to roundabouts and for widened approaches and subways (substantially less than grade separated option) |
| SC6 | | Additional roundabouts may need to be upgraded to ensure a consistent lane layout on the ORR is provided. |
| <u>Dual Carriageway</u> | | |
| | Advantages | Disadvantages |
| DC 1 | Minimum layout would provide capacity for future flow increases. Provides capacity for York Northwest developments | Availability of 'spare' capacity unlikely to discourage car based trips. |
| DC 2 | | Substantially more expensive than single carriageway due to number of structures required (particularly between A59 and A19) |
| DC 3 | Decreased journey times on the outer ring road relative to single | Increased overall journey time in ORR area as more trips on the ring road making it |

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| | carriageway links | more difficult for traffic to exit the minor arms. |
| DC 4 | | Visually more intrusive due to additional elevated carriageways |
| DC 5 | | Noise and light pollution increased to adjacent properties |
| DC 6 | | Substantial addition land required to provide room for embankments and extra carriageway. |
| DC7 | | Existing Hedgerows removed over full length of road on at least one side. |