

Crewe Green Roundabout Design Solution Selection

Options Comparison

Option	Key Criteria					Key Requirements - Options Scoring																						Affordability		
	Acceptable Traffic Solution	Operational Safety	Buildability & Maintainability	Impacts on Duchy Land	Suitability for NMU	Ease of Construction			User Perception / Ease of Use			Suitability for Strategic Site Development			Utilities Impacts			Disruption During Construction			Resilience to Increases in Traffic			Non Motorised User (NMU) Provision			Total Weighted Score			
						Weighting	Score	Weighted Score	Weighting	Score	Weighted Score	Weighting	Score	Weighted Score	Weighting	Score	Weighted Score	Weighting	Score	Weighted Score	Weighting	Score	Weighted Score	Weighting	Score	Weighted Score	Weighting	Score	Weighted Score	Total Weighted Score
1						2	4	8	4	1	4	2	1	2	4	4	16	3	4	12	4	1	4	3	2	6	52	4	£4.3m - £4.7m	3=
2						2	4	8	4	1	4	2	1	2	4	4	16	3	4	12	4	2	8	3	2	6	56	3	£4.3m - £4.7m	3=
3						2	3	6	4	4	16	2	4	8	4	1	4	3	3	9	4	3	12	3	2	6	61	1	£3.4m - £3.8m	1
4						2	2	4	4	3	12	2	4	8	4	3	12	3	2	6	4	3	12	3	2	6	60	2	£3.6m - £4.2m	2

- Notes:
- 1) Key criteria objectives are given a RAG assessment. The 4 options all meet all of the Key Criteria and so proceed to be scored against Key Requirements.
 - 2) Weightings are based upon the requirements with highest priority being assigned the highest weighting
 - 3) Scores are on a scale of 1 to 4 with a lower score indicating a lower ranking assessment
 - 4) Weighted Scores are direct multiplication of weighting and score

Ease of Construction

Options 1 & 2 involve the greatest amount of construction off highway and are therefore scored more highly

Option 3 involves a significant amount of off highway construction but with extensive tie-in and is therefore scored highly but less so than 1 & 2

Option 4 requires extensive on highway construction at both the roundabout and the Syndey Rd / Hungerford Road junctions, and whilst some off highway works are required this option has the lowest amount

User Perception / Ease of Use

Options 1 & 2 are unintuitive and involve significant deviations of route for traffic heading to / coming from Syndey Road & Hungerford Road for all origins/destinations other than Sandbach (50% of Hungerford & 90% of Sydney traffic)

Option 3 is very straight forward in it's use but involves potentially long travel distances for the relatively small proportion of vehicles that need to traverse the full roundabout. In particular the movements from Syndney Road & A534 to Hungerford Road may be perceived as excessive (though not dis-similar to the current movements from A534 to Hungerford Road)

Option 4 replicates the existing traffic movements but removes the signal controls and hence reduces delay times

Suitability for Development

Options 1 & 2 create a large degree of severance with the link through Duchy Land and the remnant area for development, whilst feasible will form a peninsula surrounded on three sides by highway. Further development to the north will be severed by the link road

Options 3 & 4 have no severance and leave little residual land with no development potential

Utilities Impacts

With the majority of road construction taking place offline Options 1 & 2 are expected to have the lowest impacts on existing utilities, though BT, MP gas, HV elec & water services are still likley to be impacted by kerb realignments and local widening of the existing roundabout

Option 3 appears to have the greatest impacts with a number of BT services impacted between Crewe Green Road & Hungerford Road in addition to those associated with kerb realignment & local widening of the existing southern half of the roundabout

Option 4 appears to be similar in impact to Options 1 & 2, but with additional impact to all services due to the kerb realignment between University Way & Crewe Green Road

BT diversions are a significant consideration for Options 3 & 4 with fibre optic services impacted. C3 quotations suggest high cost & long durations for diversions

Utilities impacts are given a high weighting due to the potential to adversely impact programme

Disruption During Construction

A workshop has been held with the Network Team. It is recognised that all options will require night-time working and closures to achieve certain operations such as machine surfacing
Provisionally Options 1 & 2 are least disruptive, with Option 4 requiring the greatest amount of construction on live carriageway and therefore the greatest level of disruption
Option 3 is disruptive but significantly less so than Option 4

Resilience to Changes in Traffic

All options perform well for current traffic forecasts with Option 1 performing worst due to the signals at the Hungerford Road / Sydney Road Junction.
The link road between the Hungerford Road / Syney Road Junction and the signals at the A534 has a risk of blocking back in either direction in the event of signal failure or if significantly heavier demands are experienced
The link between the two roundabouts in Option 4 performs well and shows no risk of queuing on the connecting link (max RFC of 0.56 and 0.52 for the southbound & northbound respectively)
The potential provision of a free-flow link from University Way to Crewe Green Road provides additional relief to what is envisaged as potentially becoming an increased demand

Non Motorised Users Provision

National guidelines have been followed to produce the solutions for all four design options
Options 1 & 2 present little change to existing NMU provision at the junction
Option 3 introduces potentially long NMU routes
Option 4 allows shorter NMU routes
All options have a potential significant drawback for the crossing of University Way & Crewe Green Road in the event of the introduction of the free-flow left turn lane. Alternative crossing locations or removal of the free-flow lane may need to be implemented to resolve this

Cost Estimates

Costs are estimated as Rough Order of Magnitudes (RoM) and are based upon Q2 2016 prices
Ranges quoted are based upon measured works with and without puffin crossings at NMU crossing points
Estimates include for preliminaries at 15%, design fees at 17%, traffic management costs at 30% and optimism bias at 44%
Land costs, legal fees and costs associated with electricity, gas and water diversions are not included