The A45 Chowns Mill 'throughabout, half-hamburger, walnut whip, moon and sun' roundabout

Mark Roxburgh – National Highways

In 2021 National Highways completed the improvements to the A45 Chowns Mill roundabout following nearly 20 months of work. The scheme has delivered improved capacity, safety and walking / cycling routes. This paper will explore the origins of the scheme, what other options were considered, the design philosophy behind the final layout and how the signalisation was developed, tested and implemented.

Introduction

In December 2021 two local MPs gathered with the leader of North Northamptonshire Council, local councillors, staff from National Highways and contractor Carnell's staff in the middle of the busy Chowns Mill Roundabout to plant a few trees marking the end of a nearly two-year project to improve the junction. Peter Bone MP referred to the new layout as an "*extraordinary double roundabout which has massively reduced traffic congestion*" and fellow MP Tom Pursglove said "*this is a huge upgrade to our local road infrastructure on what was an incredibly dangerous road previously*".

Figure 1 – Press photo of opening ceremony

Since opening, the new junction has largely been praised not just for improvements made to journey times and safety but also for being easy to navigate. Yet a few years prior when plans for the junction were first published many accused the design of being unnecessarily complex, incapable of handling the traffic volumes, confusing and dangerous. One news organisation even suggested on Facebook that the proposed junction could be a contender for worst roundabout in the country.

This change in reception did not come about because of a seismic shift in the design, in fact the final outcome is remarkably close to the original design vision. Instead, the change is one of perspective; when viewing the junction in plan it can seem overwhelming with so much to take in and comprehend, leading to the types of criticism seen early on. However, the design vision was based on the real-world perspective of end users to craft a junction that is simple to flow through while addressing the congestion and safety challenges of the old layout.

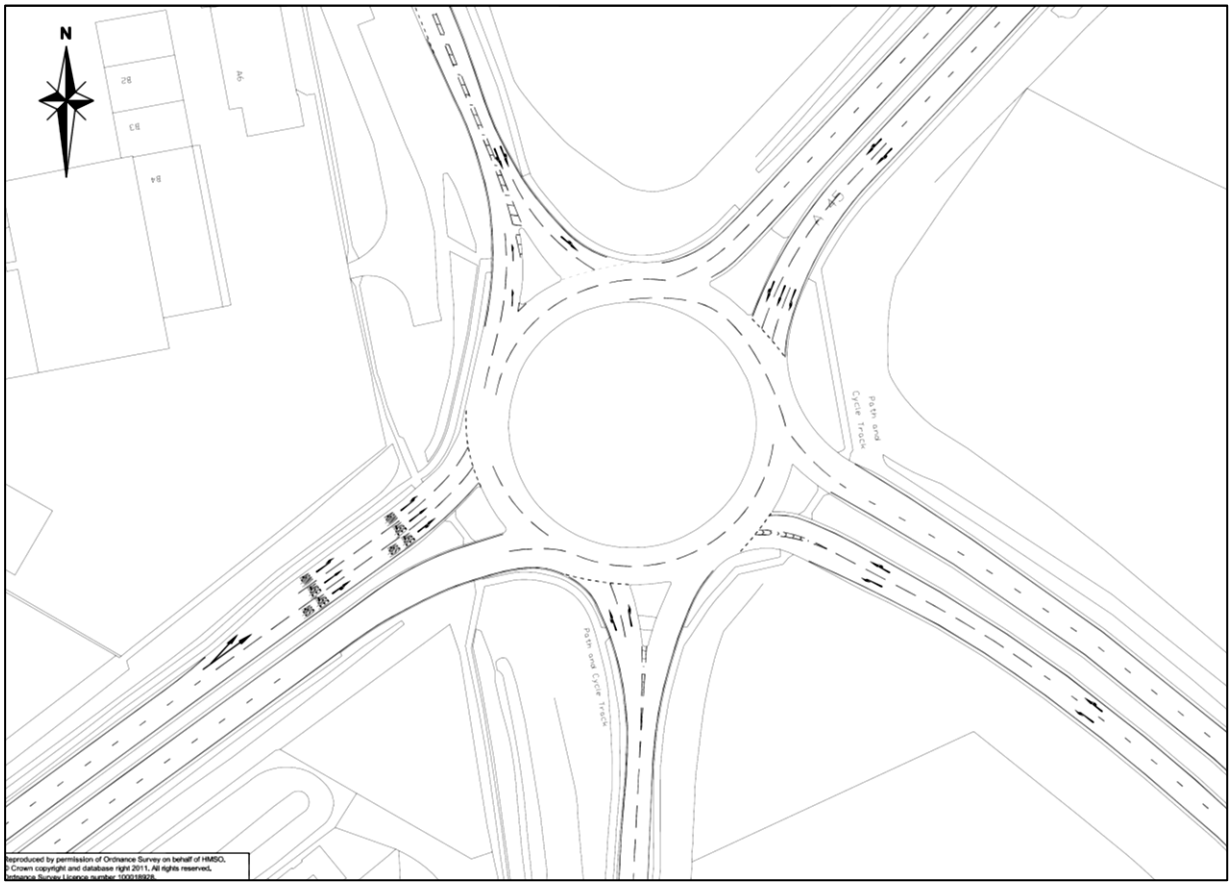
This paper explores the journey of this project; how it came about, the traffic engineering assessments that underpin the design, how this evidence was used to build support for the scheme and finally demonstrates how the new layout has benefitted customers.

The problem

The Chowns Mill Roundabout is a five-arm roundabout located in North Northamptonshire on the edge of Rushden where the A45 meets the A6, the A5028 is the fifth arm and one of three gateways into the town of Rushden from the A45.

The previous layout, opened in 2003 as part of a scheme to divert the A6 around Rushden, was relatively small for a five-arm roundabout having a central island diameter of 65m and an inscribed circle diameter of 86m. Putting this into context, the length around the circulatory is less than 240m, or less than 48m per arm on average.

Figure 2 – Chowns Mill Roundabout layout pre-2019



The primary complaints with the junction centred around peak time congestion with long queues regularly building on approaches to the junction. A 2012 survey recorded journey times on the major approaches to the junction from which peak time delays were calculated.

Table 1 – Observed average delays from 2012 survey (additional travel time compared to off-peak)

Approach Arm	Morning Peak Average Delay	Evening Peak Average Delay
A6 North	23s	7s
A45 West	6s	53s
A6 South	24s	52s
A5028 Station Road	(journey times not surveyed)	
A45 East	4min 42s (282s)	1s

In the same survey, observed mean-max queue lengths exceeded 300m on the A45 East and A5028 Station Road arms in the morning peak and the A6 north in the evening peak as well as exceeding 200m on the A45 West in the evening peak.

Figure 3 – Photo of queues on A45 East approach during morning peak in 2012

In addition to congestion, safety at the junction was also a concern; between September 2006 and August 2011 31 injury collisions were reported at or on approach to the junction which resulted in 38 casualties including one fatality. 19% (6 No.) of the reported injury collisions resulted in one or more KSI (Killed or Seriously Injured) casualty.

Furthermore, these congestion and safety concerns were seen as a barrier to realising planned growth in Northamptonshire. In East Northamptonshire alone growth allocations included almost 8,000 new homes and 7,000 new jobs including the Rushden East site adjacent to the A6 south of the scheme with an allocation for 1,500 houses and 280 jobs. Early analysis in TEMPRO forecast traffic growth from 2014 to 2035 at over 30% in the peak periods.

While some arms of the junction had relatively wide verges, space on the northwest corner was limited as the redundant section of the old A6 was in use as a car park for the adjacent Chowns Mill Business Park. The topography of the site also meant this space would be challenging to use with a level difference between the A45 and this parking area. Indeed, a steep earth bank runs the length of the boundary between the A45 and the Chowns Mill Business Park.

The junction is also located on the edge of the Nene Valley, close to extensive areas of vital wetlands which provide habitats for overwintering birds.

Early options

When an option study commenced in 2012 the funding for improvements was restricted to two main sources:

- Major schemes programme for large scale infrastructure projects of national or regional significance and not a viable route for investment at Chowns Mill Roundabout.
- Pinch Point programme; with a specific focus on small-scale schemes that could be delivered quickly, within existing highway land and generally costing no more than £10m.

This optioneering exercise therefore prioritised a focus on schemes that would meet the Pinch Point criteria in anticipation of future funding rounds. These early options are summarised in the following table, including the rationale behind each proposal and the conclusions from the first sift. The sift itself was based upon:

- Linsig models using surveyed flows,
- engineering assessments of the operability, and
- qualitative estimates of the economic case (value for money).

Table 2 – Summary of first option development and sift

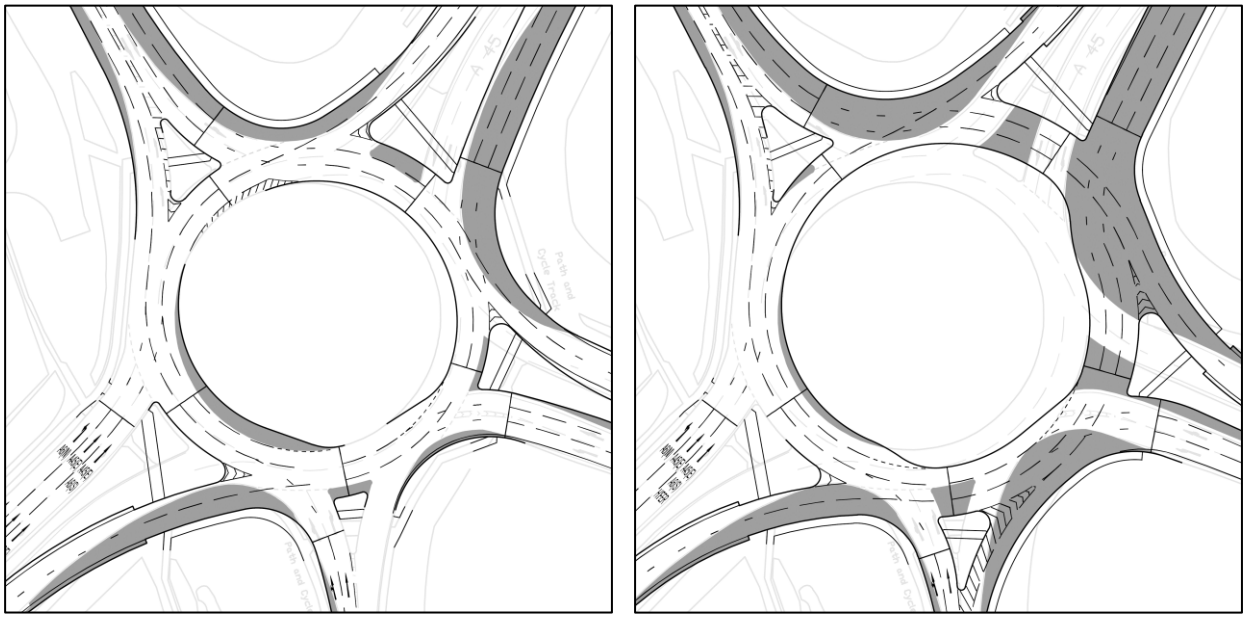
Option	Rationale	Sift
Localised widening and spiral markings	Lowest cost option	Would improve capacity but unable to fully cater for existing demand flows
Indirect signal control (west and north arms)	Use of indirect signals to create gaps in circulating traffic and increase entry capacity for worst performing arms	Benefits some arms at the expense of others with a forecast net increase in delays
Signalise A45 and A6 arms alongside localised widening and spiral markings	Provide increased lane space and direct control of entry capacities	Short circulatory links limit scope to stack traffic, maintaining safe coordination results in very low entry green times - unable to fully cater for existing demand flows
Enlarged priority-controlled roundabout	Based on an option from a 2007 study; seeking to improve gap seeking by increasing separation between arms	Improves capacity but would require land outside existing highway boundary and unable to fully cater for existing demand flows
Signalised (5-arm) crossroads	Based on an option from a 2007 study; seek to create space for more approach lanes	Significantly detrimental due to complex staging and high proportion of lost time in interstages
Double roundabout	Exploration of scope to separate out some conflicts	Close to meeting capacity requirements for existing demand flows but increases overall number of conflict points, would require large area of land outside existing highway boundary and incur significant costs to re-align one or more links
Compact Throughabout	Allow A45 through traffic to bypass minor arms and improve node performance	Space taken by through links erodes stacking space on outer ring, safe coordination results in low entry green times, unable to fully cater for existing demand flows

Grade separation with dumb-bell layout	Based on an option from a 2007 study; remove A45 through traffic from conflict points	Good level of journey time benefit although eastbound offslip forecast to have long queues on this could probably be addressed with design iteration. Highest cost option with extensive land acquisition required even with restricted geometry that would be subject to departures from standards. Greatest environmental impact.

Of these options the partial signalisation of the roundabout offered the most promising outlook but still did not address all the existing issues, with the morning peak volumes using the A5028 proving too high to manage under priority control and the need for safe coordination limiting entry green times on the signals.

This option was further iterated into two fully signalised options, both with additional flares on approaches, widening of the circulatory and re-alignment of approach arms to improve stacking space – all still within the existing highway boundaries. The two options mainly differed in the size of the circulatory with one largely retaining the existing shape and the other enlarging the roundabout to the east to take advantage of the wider verge space on this side.

Figure 4 – Plans of 2012 signalised options



Result of the Linsig analysis of these two options showed very similar performance with enlarged roundabout having slightly more capacity and lower delays. To better understand the performance of these options they were tested in VISSIM, alongside the cheapest option of local widening and spiral markings for context and to test to a horizon year of 2035. The use of VISSIM for this testing was selected because directly comparable results can be obtained for all options, irrespective of level of signalisation included.

The overall results of this assessment showed all three options as providing benefits in the peaks and interpeaks, with the signal options performing much better at peak times

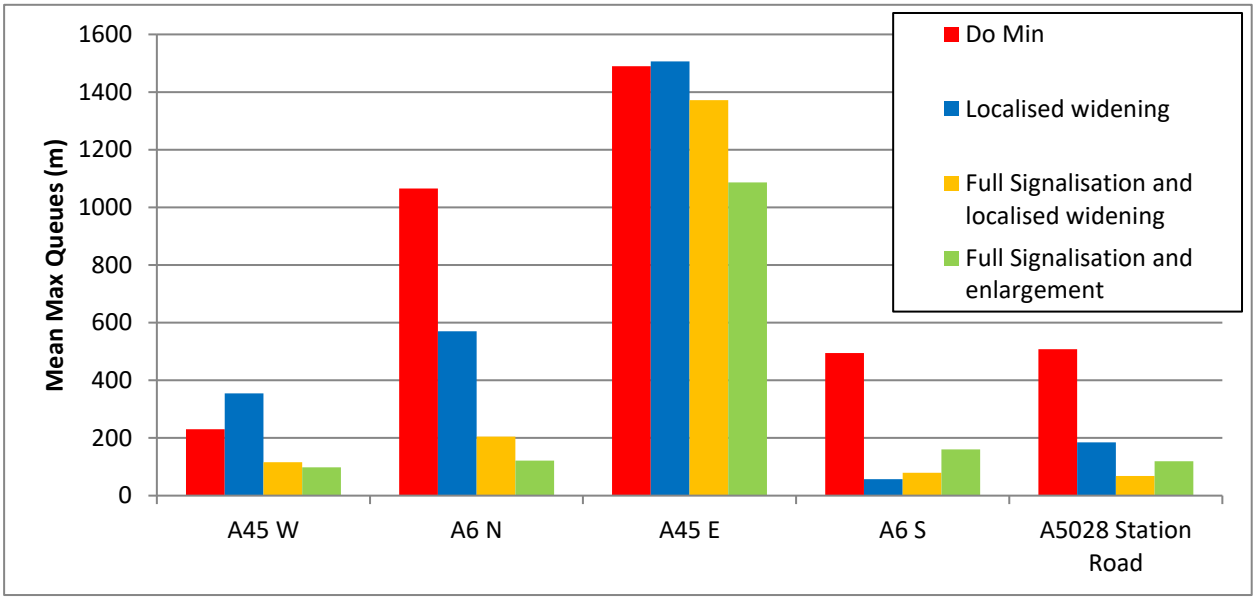
and the priority controlled option offering slightly better interpeak performance. As expected, off-peak results showed little change for the priority option but the introduction of signals caused additional off-peak delays.

Table 3 – 2012 VISSIM model network peak hour results for 2035 assessment year

Option	Morning Peak		Evening Peak	
	Flow (veh)	Ave. Delay / veh (s)	Flow (veh)	Ave. Delay / veh (s)
Existing Layout	8,445	362	9,304	380
Localised widening and spiral markings	8,868	272	9,542	208
Full signalisation with localised widening and spiral markings	9,611	193	9,539	108
Full signalisation with enlarged roundabout, localised widening and spiral markings	9,627	160	9,560	60

Delving deeper into the results however shows that even the best performing option in the peak periods (full signalisation and enlargement of the circulatory) did not provide sufficient capacity for the 2035 forecast flows with queues over 1km long and delays of over 5 minutes still forecast on the A45 east arm.

Figure 5 - 2012 VISSIM model morning peak queue results for 2035 assessment year



An initial economic appraisal was developed for each of these three options using:

- Estimated works and average annual maintenance costs,
- Safety benefits in opening year,
- Opening year journey time results – as was the standard approach at the time for small schemes, and
- An assessment period of 60 years with annual figures being converted to the full period using standard multiplication factors.

Table 4 – Summary of 2012 economic appraisal based on opening year (2014) results only

Option	Preliminary Cost Estimate (2014 value)	Present Value of Benefits (2010 value)	Preliminary Benefit to Cost Ratio
Localised widening and spiral markings	£2.5m	£24.1m	17.45
Full signalisation with localised widening and spiral markings	£5.1m	£21.6m	7.81
Full signalisation with enlarged roundabout, localised widening and spiral markings	£6.4m	£22.4m	5.98

It is worth noting the reason the priority-controlled option out-performs the signalised options in the overall assessment is because of the disbenefits the signals introduce during the off-peak hours.

These early results were encouraging and indicated that any of the three options would likely provide value for money and could potentially be put forward for funding. However, several factors influenced the decision to pause and reconsider the scope of options including:

- None of the options met the forecast peak hour traffic demands and therefore would not enable the growth in the local plan,
- Growth calculations at this stage were based solely on TEMPRO forecasts which while based on local plan allocations does not account for the detailed locations of allocated sites,
- The disruption from delivering these improvements would erode some of the benefits,
- Costs were based on an outline design and may increase as design detail is developed, and
- Improvement to the Chowns Mill roundabout may attract traffic which is using local roads to avoid the junction to re-route to the A45, further undermining the junction performance.

Perhaps most significantly however, discussions were commencing on a possible next round of Pinch Point funding which would ease some of the restriction imposed on the first programme. This included potentially allowing for greater cost envelopes, longer delivery periods and opportunity to include some land acquisition or highways act orders.

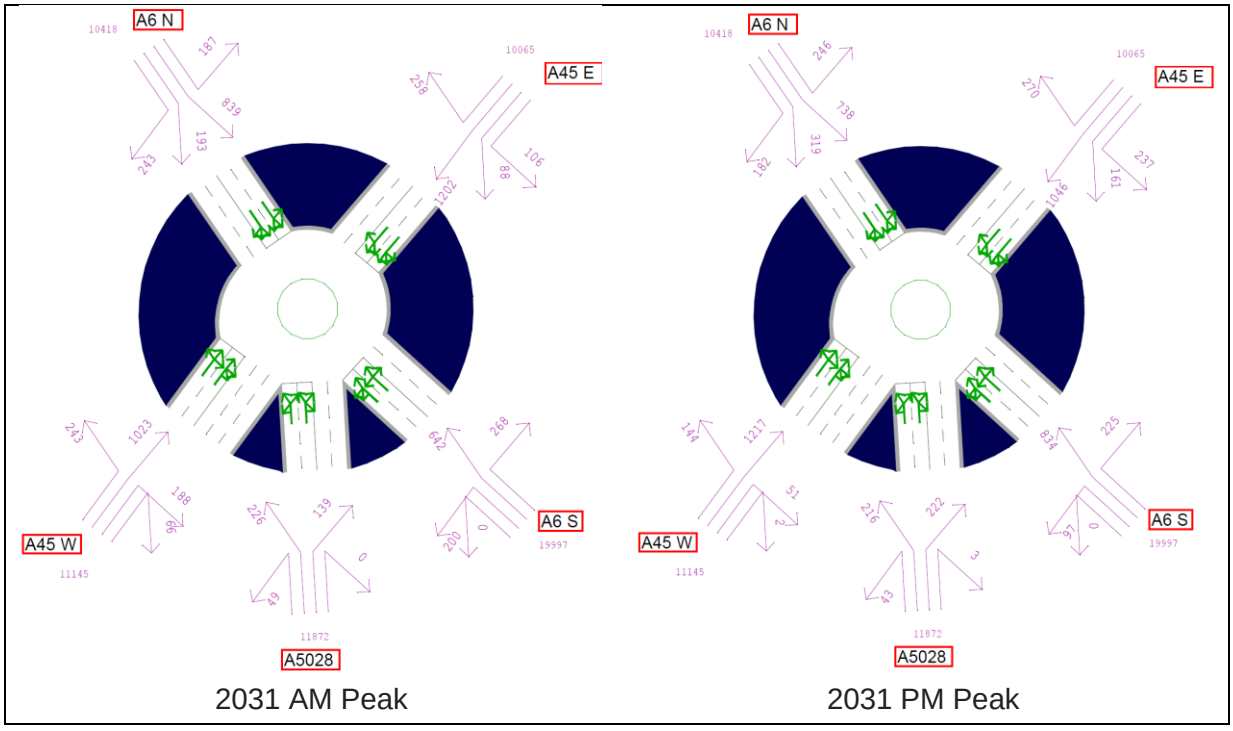
A new focus

A decision was made therefore to return to option identification with a revised focus; shifting from what can be accommodated within funding limits and boundary constraints to instead seeking to design to a forecast scenario based on the local plan projections.

A new approach was therefore required with the first step being to generate the target design flows. Through collaboration with Northamptonshire County Council a branch of the Northamptonshire Strategic Transport Model (NSTM) was developed with improved validation in the area surrounding Chowns Mill Roundabout.

Use of the NSTM model allowed for full inclusion of the local plan sites as well as dynamic routing assessment and was therefore used to develop the initial demand flow forecasts for use as target design flows. This did however require a change of design year from 2035 to 2031 based on the available scenarios in NSTM.

Figure 6 - August 2014 Demand Flow Forecasts (vehicles)



These design year flows were then analysed to understand movement and conflict patterns to inform the generation of further options. A few key insights can quickly be gained from these plots:

- The major demand flows on the junction are between the A45 arms at 1000-1200 veh/hour (17-20 veh/minute) in each direction with the range reflecting a tidal element,
- These A45 through flows represent about 37% of the total demand flow at the junction,
- Demand flows along the A6 are also significant in the order of 600-900 veh/hour (10-15 veh/minute) in each direction comprising around 25% of the total demand flow,
- Multiple other movements have demand flows in the 200-300 veh/hour (3-5 veh/min), and
- There is a negligible flow between the A6 south and A5028 (as this is served by a better alternative to the south).

The most obvious conclusion from analysing these flows is to consider grade separation and remove the conflicts between the two highest flows. While the previously considered grade separation option had capacity issues, it is clear these could be addressed through design changes.

However, grade separated solutions come at a high financial, and potentially environmental, cost. Typical costs for grade separating a junction at the time were in the region of £50-100m which would exceed the likely journey time and safety benefits.

Furthermore, the junction is located on a gentle slope on the edge of the Nene Valley where there are long sightlines across the landscape. Building upwards, the top of a structure would likely to be over 7m above existing ground levels with signs and lighting columns extending further; this would have a significant impact on vistas across the valley. Digging down for an underpass would be more expensive still and risked complications with drainage given the high water-table – the junction elevation is less than 10m above the local base of the valley.

Grade separation was therefore deemed un-viable and ruled out of contention.

With heavy ahead movements perhaps the other obvious choice is a throughabout, where one or more movements cut through the middle of a roundabout at grade and often referred to as a ‘hamburger’ layout. Several variants with both A45 ahead movements being taken through the middle were considered and subject to initial Linsig assessment however these also proved to have limitations.

Most significantly was the safety consideration of coordinating through movements in both directions even though they shared the same stage at the nodes on the ends of the through link. For these options to work one of two compromises would be required:

- a compromise on safety by having the cut-through red appear in the middle of one, or both, of the likely high speed through movement platoons risking drivers red-light running or having shunt collisions from a sudden stop; or
- introducing inefficient staging where the cut-through exit greens run on beyond the end of the approach green phases and reducing the achievable capacity.

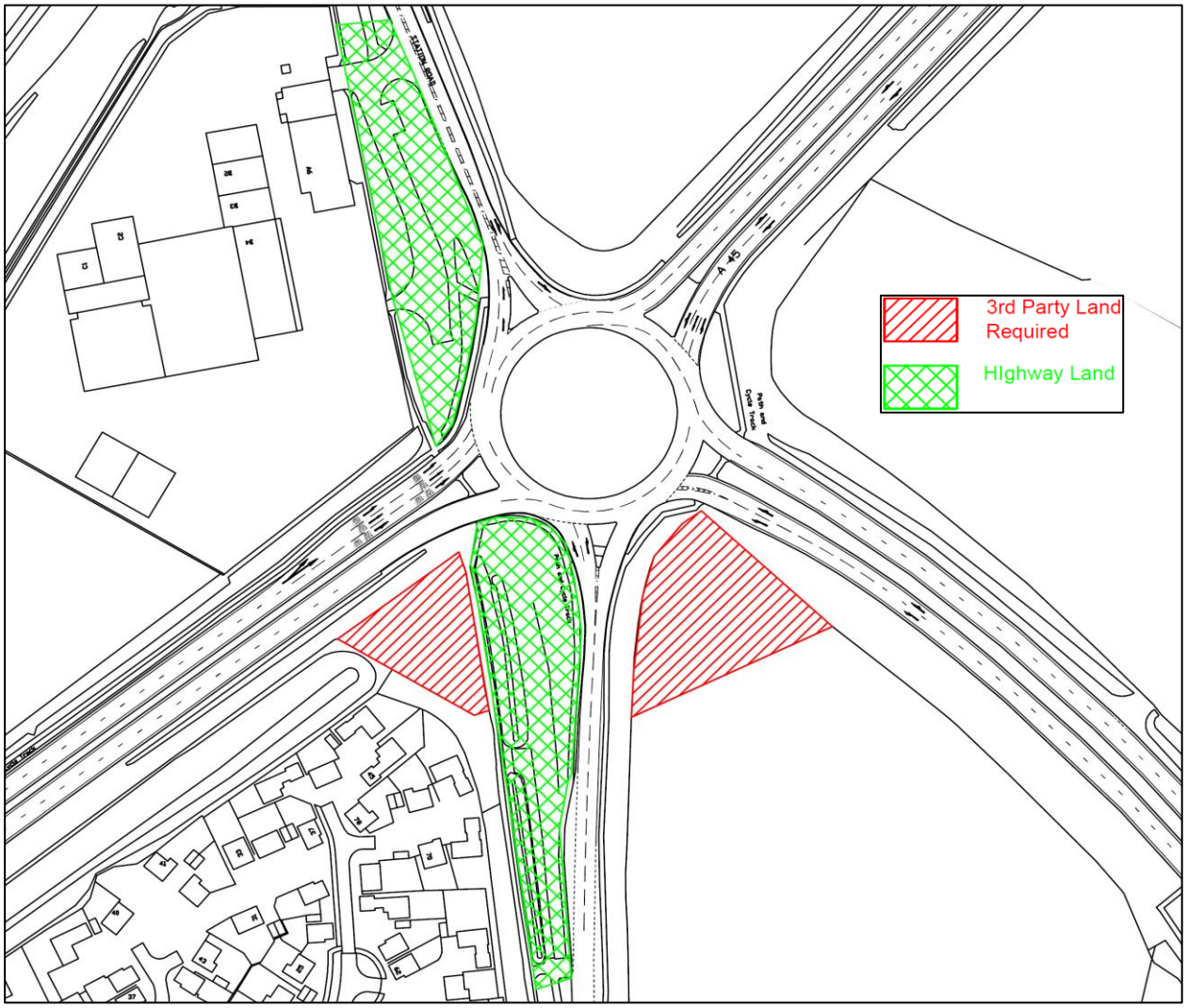
Beyond the boundary

The search continued therefore for a better solution and the breakthrough came from returning to consider land boundaries.

To ensure any proposed scheme would achieve a suitable cost-benefit ratio costs would need to be controlled and the move to consider larger options presented a risk that land acquisition cost could escalate. A review of the surrounding area identified two parcels of land adjacent to the junction which appeared to have low value.

Both these parcels were locked between the highway and existing or committed development with no likely source of vehicular access that would permit the plot to be developed. Both were also too small to be of significant value as arable land and appeared to be in an unmanaged state.

Figure 7 – Plan showing areas of land required outside of operational highway boundary

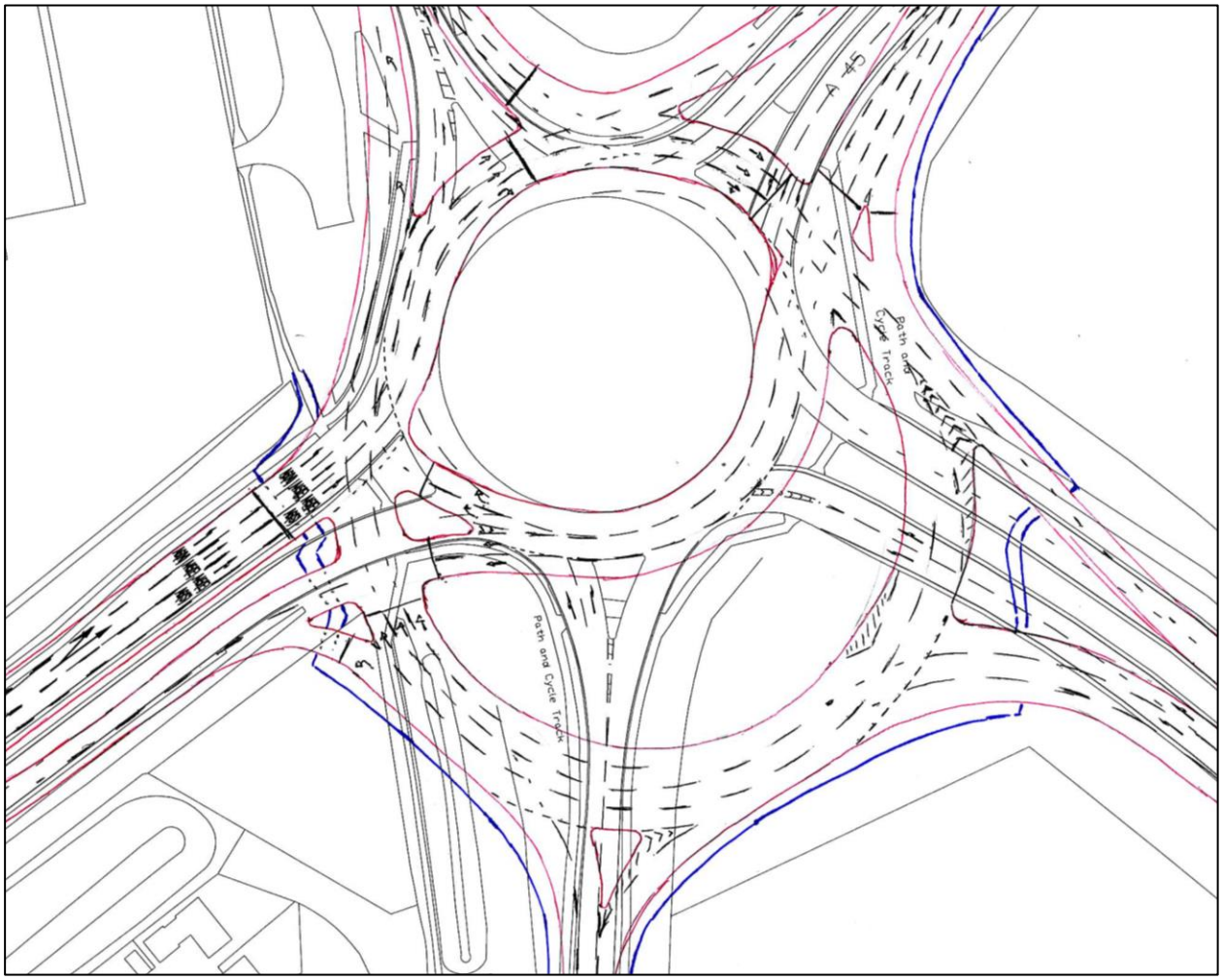


A working assumption was made that if a suitable option could be identified using just the existing highway and land from these two plots then it would control the risk of high land costs. As a result, option development started to focus on this geographic extent while still considering the forecast demand flow patterns and learning from the previous signalised roundabout tests.

From those previous tests one of the biggest challenges had been to coordinate the A45 westbound movement around the southern circulatory and past two side roads, the A6 south and A5028. Simply enlarging the roundabout to the south would not alleviate this but a combination of a new southern link while retaining the existing circulatory as a through link quickly showed promise.

This new southern link would effectively operate as a collector road, combining the flows from the A6 south and the A5028 into a single node conflict with the heavy A45 westbound movement. Further analysis of the flow conflicts on this preliminary layout also led to decisions to allow both the right turns from the A45 east arm and the A6 north arm to use the through link, this would both reduce the level of flow conflict and avoid introducing further travel distance for these movements.

Figure 8 – Preliminary sketch of 'half hamburger' layout



Linsig modelling was used to demonstrate initial proof of concept and as a result land enquiries were made to establish the potential for acquiring the two parcels of land. The result that came back from the initial land searches would be the final piece of the puzzle that would cement this as the preferred solution; both parcels of land were non-operational highway land belonging to Northamptonshire County Council.

Early engagement with officers from Northamptonshire County Council confirmed agreement to sell the land for the purposes of improving the junction and unlocking a critical location for the local growth plan.

In 2014 the VISSIM model was expanded to cover the next junction on each of the major arms and re-validated to allow for testing of any interactions between junctions. This was used to test the new 'half-hamburger' layout and verify the overall level of capacity enhancement that could be realised.

Due to the change in model extents and forecasting approach these results are not directly comparable to the 2012 VISSIM. Nonetheless, these initial results were very encouraging, showing strong performance improvements in both peak periods.

Table 5 –2014 VISSIM model network peak hour results for 2031 assessment year

2031 Design Year	Morning Peak		Evening Peak	
	Flow (veh)	Ave. Delay / veh (s)	Flow (veh)	Ave. Delay / veh (s)
Existing Layout	8,384	267	8,779	352
'Half Hamburger' layout	7,989	74	9,155	101

By this time development of the first Road Investment Strategy (RIS) was underway and the scheme at Chowns Mill was proposed as a candidate for inclusion, supported by a Strategic Outline Business Case. This proved successful and funding for the scheme was confirmed in the RIS announcement in December 2014.

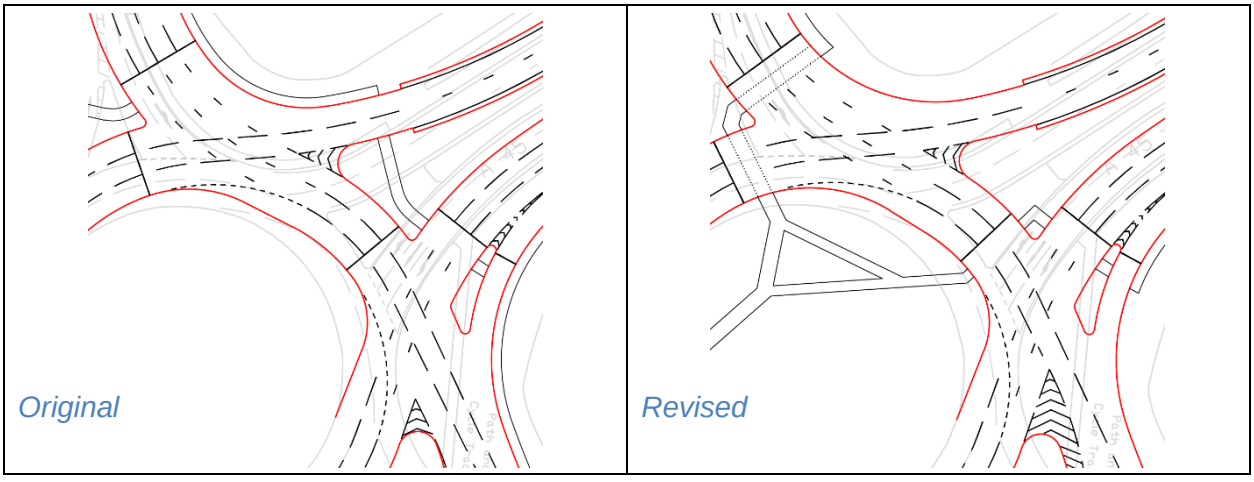
The driver's perspective

Having defined an overall form for the junction attention next turned to driveability, seeking to make the junction as simple as possible for any driver to navigate.

To achieve this as many approach lanes as possible are dedicated to a single movement – though one movement may be served by more than one lane – meaning drivers can get in lane well in advance of the conflict points. Remaining decision points, where drivers need to select an appropriate lane, were located on the quieter parts of the roundabout and, so far as possible, away from the signals to minimise conflicts between signing and signals.

As the layout was refined each movement through the roundabout was reviewed from the perspective of a driver to ensure this philosophy was being achieved. This led to a change on the A6 north approach to have a lane dedicated to the right turn, moving the movement to the A5028 into the adjacent ahead lane. This allowed the design to positively guide this right turn into the cut-through, removing the decision point that was previously at this location. The revised decision point, now between the A6 south and A5028 destinations, is located on the outer ring in a location that is more typical for a roundabout.

Figure 9 – Comparison of layout options for right turn into cut-through



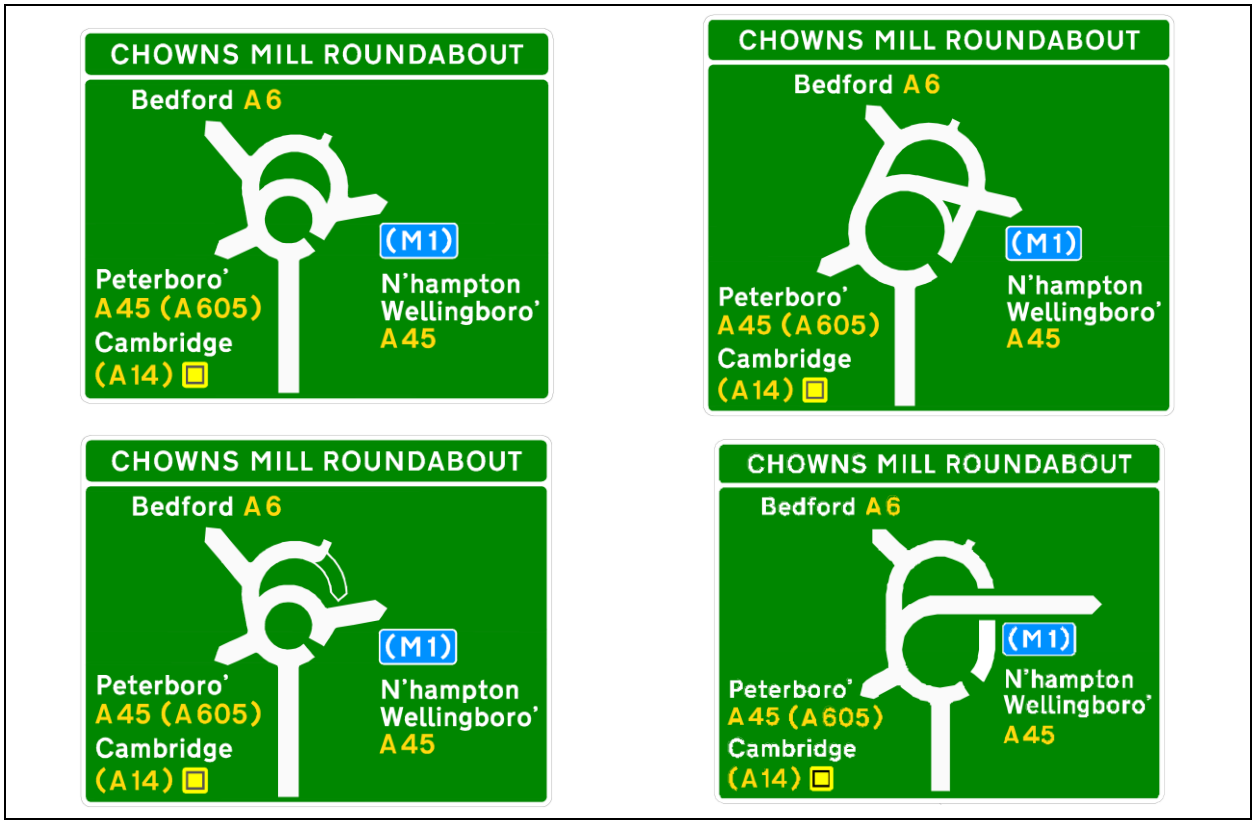
Using the existing circulatory carriageway for the through movement was also a very deliberate decision, offering both cost and operational benefits. The cost argument is straightforward, the operational benefits may be less so and included:

- facilitating use of the through link for right turns by avoiding sharp turns to enter or leave the link,
- maintaining deflection on the A45 westbound ahead movement helping to control vehicle speeds on the junction,
- limiting the difference in approach angles of the through and circulating lanes on the A45 east arm and therefore the size of splitter island between them and thus keeping the node compact, and
- similarly maximising the available stacking space on the east circulatory.

To expand on that final point, the stacking space on the east circulatory would still be limited and a positive decision was taken to ensure that the A45 west arm had a dedicated right turn lane (for movements to the A6 south and A5028). This would allow a longer stacking around the roundabout and protect vehicles in this space from being clipped by vehicles exiting to the A45 east.

Driveability also heavily influenced the signing strategy for the junction and informed the decisions to include gantry signing on the three widest approaches. Careful attention was also paid to the map signs with several designs being drawn up and reviewed by a design panel. The final layouts were selected based on a balance between clarity of the junction form and appropriate paths through for each movement.

Figure 10 – four of the six map sign options considered for the A6 southbound approach



Pedestrian and cycles

Throughout the options process it was also vital to consider the needs of walkers and cyclists on this key desire line between Rushden, Irthlingborough and the trails along the Nene Valley. As is typical for such junctions there is a conflict between capacity requirements for road traffic and the needs of pedestrians and cyclists for direct, effective and attractive routes.

The most significant desire lines are from the western side of the A5028 to both sides of the A6 north. Early options included crossings around the periphery of the roundabout across the A45 west and A6 north arms however at all stages of the signal cycle there is demand for the movement into the A6 north meaning any crossing here would cause blocking back. Indeed, the two-to-one merge on this exit would likely lead to slow moving traffic and short-term queuing in the exit which could block a crossing here.

Thus, a route through the central island was developed which, while requiring more crossings, offers a slightly more direct route and avoids the issues identified with a crossing over the A6 north exit.

It is worth noting that grade separated pedestrian and cycle routes were not considered for the junction as such a route already exists to the west of the junction. Early engagement however identified that some users avoided this alternative as a length of it is not overlooked and preferred a route along the main roads where they could be in view of passing motorists.

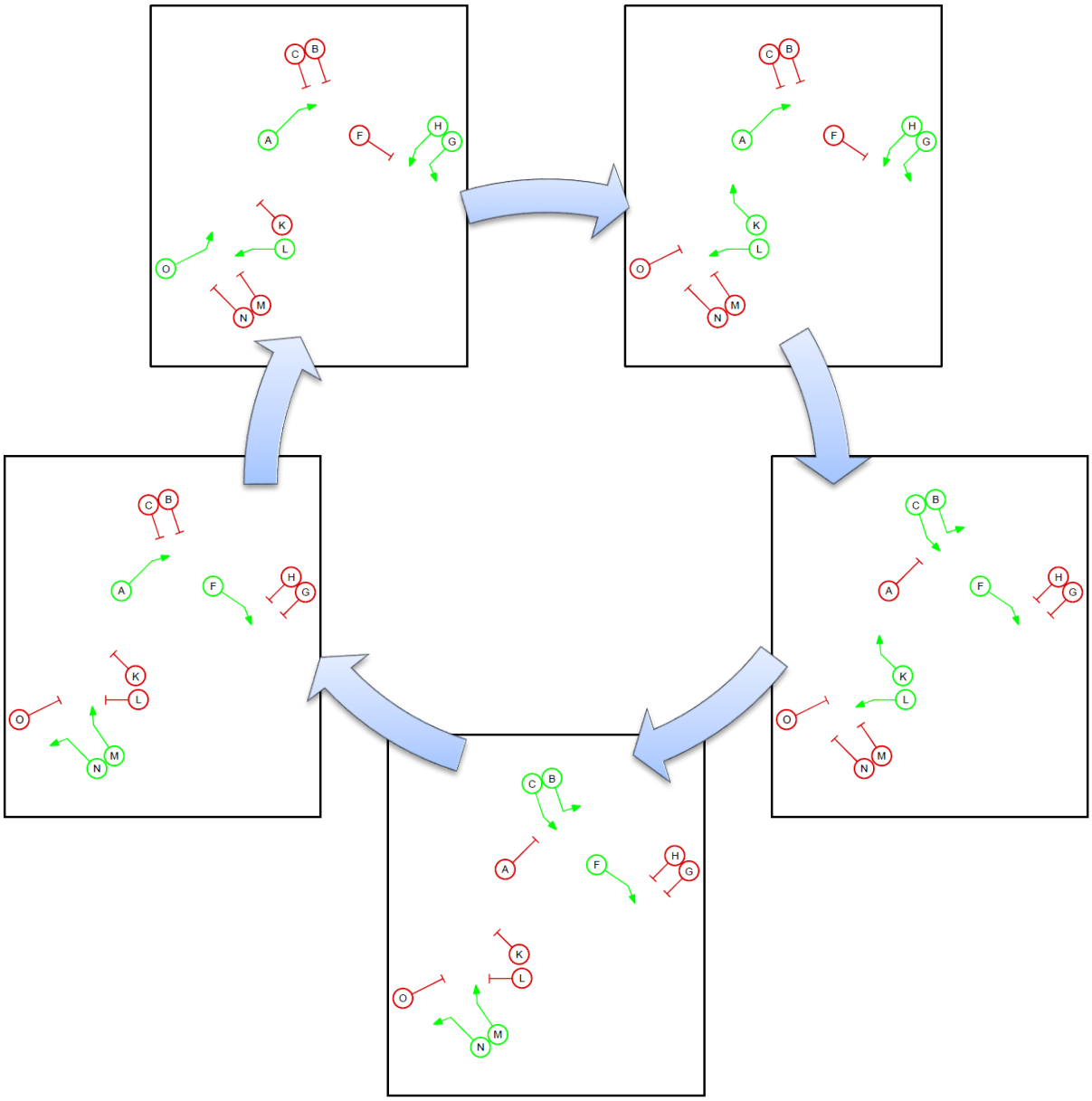
Coordinating the signals

The proof-of-concept Linsig model was used to develop the overall signal strategy for the junction and inform other modelling packages. Given the dominant ahead flows there is a need to overlap the green times for opposing entries. With the layout collecting the A6 South and A5028 arms into a single node at the inner ring the overall operation is very similar to a simple 4-arm roundabout.

The creation of stacking space on the three internal stoplines is critical to supporting this operation, allowing opposing entries to run at the same time and stacking the right turns from these on the circulatory. These right turns are then cleared once the opposing entry has cleared and ahead of the following cross movement.

The diagram below illustrates the general coordination pattern, though as each node is a separate stream the exact pattern can be allowed to vary within MOVA.

Figure 11 – Simplified diagram of traffic signals coordination pattern



The signal setup from Linsig was then imported into VISSIM as fixed time plans as the costs of developing a full multi-stream linked MOVA setup for the model were deemed disproportionate (this was before MOVA 8 was released with built in stream to stream linking). The VISSIM model was in turn used to inform the coding of the proposed scheme in the NSTM SATURN model, this use of VISSIM provided additional confidence that the junction capacity in SATURN was representative of the achievable throughput.

A round of iteration was also undertaken, with the revised demand flow forecasts from NSTM being run back through the Linsig and VISSIM models, refining the signal timings to suit, before re-running the strategic model with the updated capacity figures.

Final scheme assessment

With the scheme layout fully matured a full updated appraisal was produced in 2016 which included:

- morning peak, evening peak, interpeak and off-peak travel times, distances and costs from the NSTM SATURN model for the opening (2021) and design (2031) years,
- change in carbon emissions from TUBA,
- construction delay impact assessment also from the SATURN model,
- collision analysis using COBALT,
- local air quality impacts, and
- noise impacts.

Table 6 – Summary of 2016 economic appraisal using opening and horizon year results

Option	Cost Estimate (2021 value)	Present Value of Benefits (2010 value)	Benefit to Cost Ratio
'Half Hamburger' layout	£21.1m	£41.6m	2.97

While the BCR value for this scheme is notably lower than the earlier options the overall level of benefit is much higher. Perhaps most crucially though, the 'half hamburger' layout was shown to provide sufficient capacity to accommodate planned growth and therefore help to support the local plan ambitions.

A further sensitivity test was also run in NSTM to assess how the proposals would perform if the remaining single carriageway section of the A45, between Stanwick and Thrapston, was to be upgraded to dual carriageway. This test confirmed that the additional traffic generated by such a dualling scheme would have only a minor impact on journey times through the Chowns Mill scheme with all average journey time increases less than 6s.

The scheme appraisal would be updated twice more to reflect changes in cost once scheme had been tendered and again as the outturn costs were finalised. Perhaps unsurprisingly costs increased and the final estimate for the benefit to cost ratio was 2.09, therefore at the bottom end of the high value for money category.

Figure 12 final scheme layout from scheme brochure

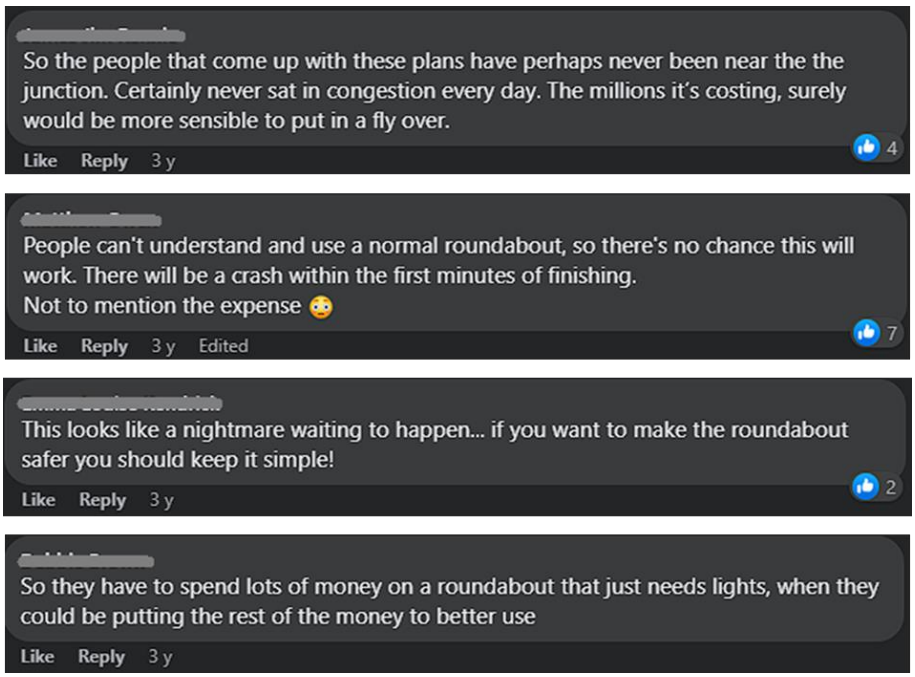
Public confidence

When the preferred option was first published initial reaction was largely negative with three main themes quickly emerging:

1. The scheme should be a fly-over
2. The scheme is a monstrosity and will be a nightmare to drive
3. Just put signals on the existing roundabout

The third point was less frequently raised and simple to address by explaining that such options had been looked at and shown to be inadequate to meet forecast demands.

Figure 13 – Example negative comments following publication of scheme layout



The first two points though were more challenging and intertwined – many observers did not believe that the scheme could ever provide enough capacity or be safe for drivers given the unusual layout. The case for rejecting grade separation was set out in the scheme brochure and exhibition panels but was insufficient to convince many that the at grade layout was a better overall solution.

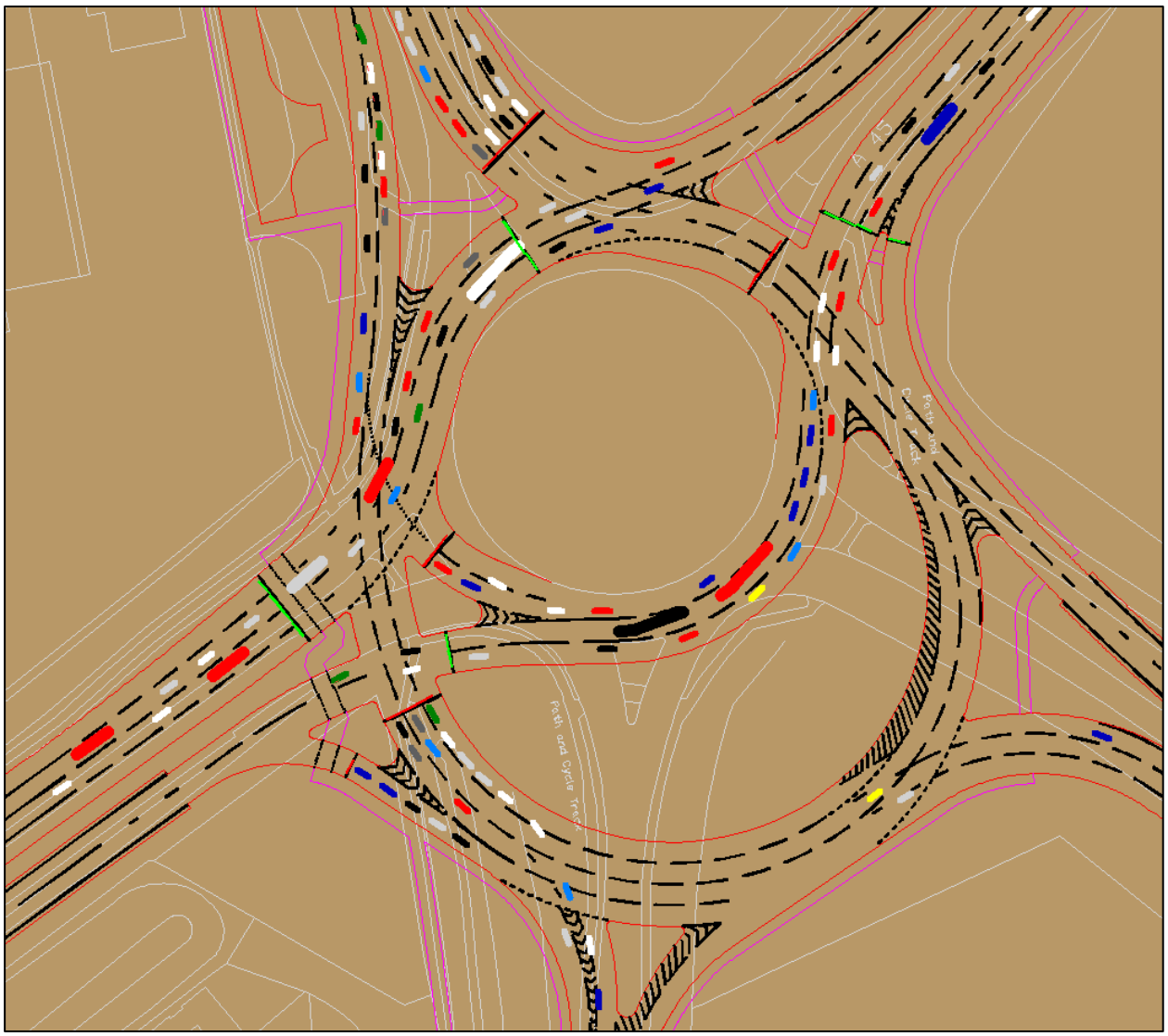
To provide a better view of the scheme a rendered 3D model of the layout was commissioned, displayed in a video flythrough showing the scheme from different angles while following the major routes through the junction. The video fly-through was posted on the project page and played on continuous loop at all public information events. Still images from the 3D model were also used throughout the scheme brochures, providing further views of the proposals.

Figure 14 – Example image from rendered 3D model of design

The 3D model proved very effective; some customers were observed watching the video cycle round three or four times at the exhibitions. Many were still not convinced however, sure that the junction would lock up and fail to deliver any meaningful improvement to journey times or safety.

To help demonstrate how the roundabout would work, and the underlying coordination design, a copy of the VISSIM model was available at all the events, manned by the designer of the layout who could talk through the detail. Throughout the various conversations the VISSIM model proved an invaluable tool and having the model available, not just a video, allowed far more control to show specific details in response to questions raised.

Figure 15 – screenshot of VISSIM model used at public exhibitions



Most people who engaged in conversations about the model left satisfied that the layout had been well engineered and careful attention has been paid to ensure it would work efficiently and safely. Unfortunately, a small minority remained unconvinced.

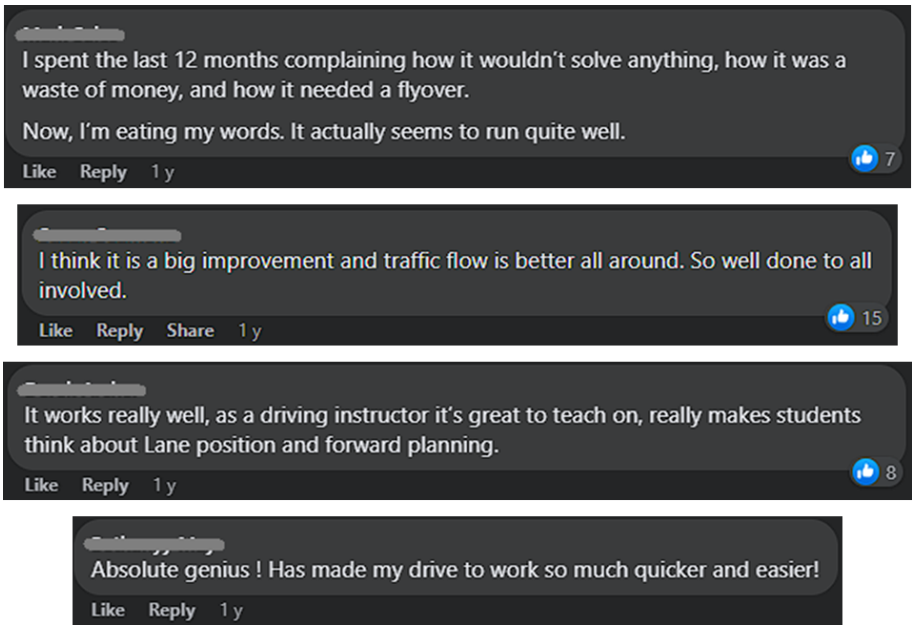
Open to traffic

MOVA control was implemented on the junction in January 2022 following completion of all the residual works and full removal of the traffic management. The new layout has been successfully operating for over a year now and reaction has been overwhelmingly positive.

Figure 16 – Drone image of new layout during MOVA validation, Jan 2022 (courtesy of Stuart Minchin, Independent Signal Design Ltd)

The most common comments relate to the ease of using the junction, how it feels much safer and of course the much faster journeys. There are still some negative comments but these are heavily outweighed by positive ones – indeed messages criticising the new junction have often been openly challenged by users with positive views.

Figure 17 – Example positive comments following scheme completion



The scheme has not yet been operational long enough for a post opening project evaluation to be carried out as there is insufficient detailed data. Site observations confirm though that the junction clears all queued traffic on the next green phase and there is no build-up of queues in the peak hours.

Flows have been extracted from the nearest (working) permanent count sites on the A45; unfortunately, these are both beyond the next junction and thus the conclusions drawn should be treated with caution.

Figure 18 - A45 Flows at Ditchford Lane Overbridge (Tuesday-Thursday for months of Sep-Nov)

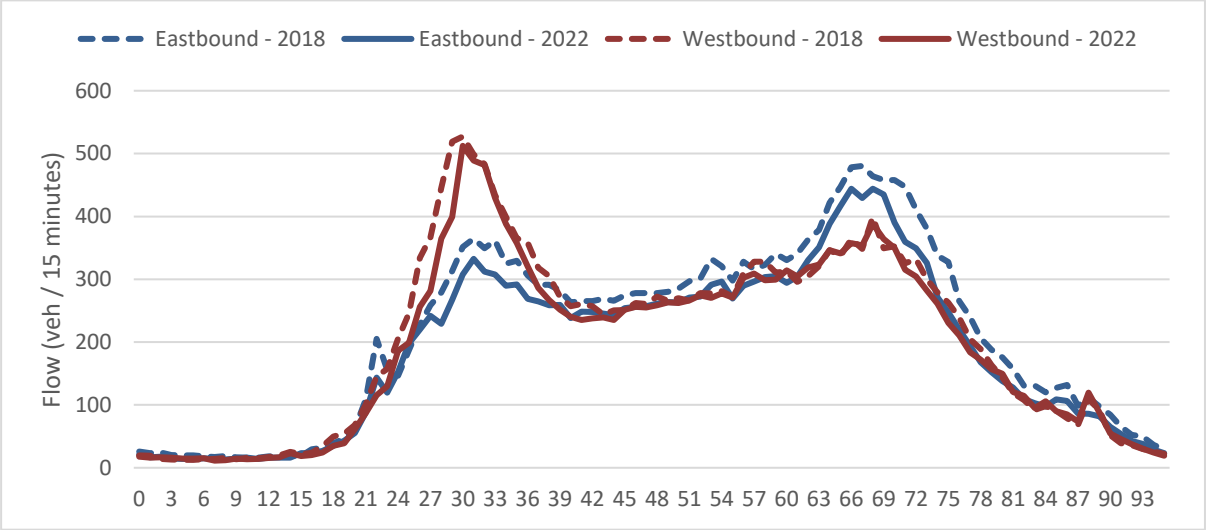
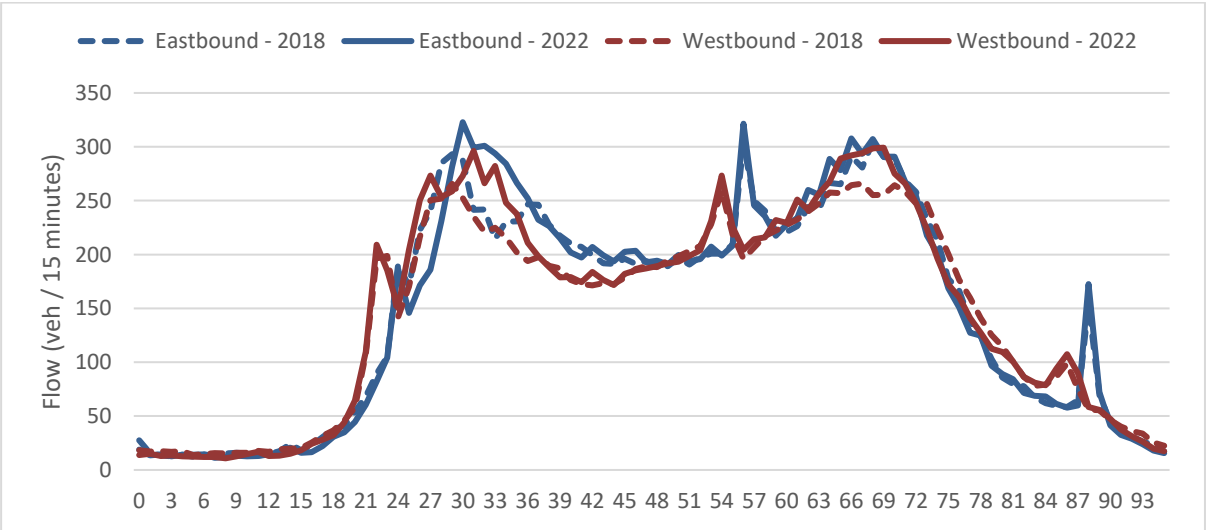


Figure 19 - A45 Flows West of Raunds Roundabout (Tuesday-Thursday for months of Sep-Nov)



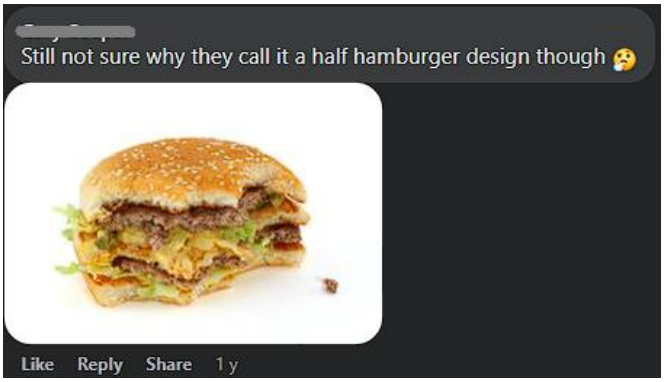
This data suggests that flows on the A45 have not changed much since the scheme was completed. Notably the westbound flows heading towards the junction appear to have increased slightly in both peaks whereas the eastbound flows towards the junction have slightly decreased.

Overall, it is reasonable to conclude that the reductions in queues and delays at the junction now observed are a direct result of the scheme delivering improved capacity. It will likely be several years though before the junction is tested with the higher flows forecast in the assessment.

A rose by any other name

Ever since the first sketch of this scheme there has been varied opinion on how to describe the layout or what to call it. The scheme brochure refers to it as a ‘half-hamburger’ layout because it only has a cut-through in the one direction. Engineers generally refer to it as a throughabout, looking beyond the shape to the operational principles of the layout.

The shape of the junction earned it an early nickname of the ‘Walnut Whip’ although given the loose resemblance this nickname failed to gain any long-term popularity. Perhaps the most unique name though came from one commenter who said their daughter likened it to a moon and sun side-by-side.



Mark Roxburgh
Engineering Team Leader
National Highways
mark.roxburgh@nationalhighways.co.uk