



West Sussex County Council

SHOREHAM AREA SUSTAINABLE TRANSPORT PACKAGE - A259/A2025 SOUTH STREET JUNCTION

Feasibility Study





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1. SUMMARY

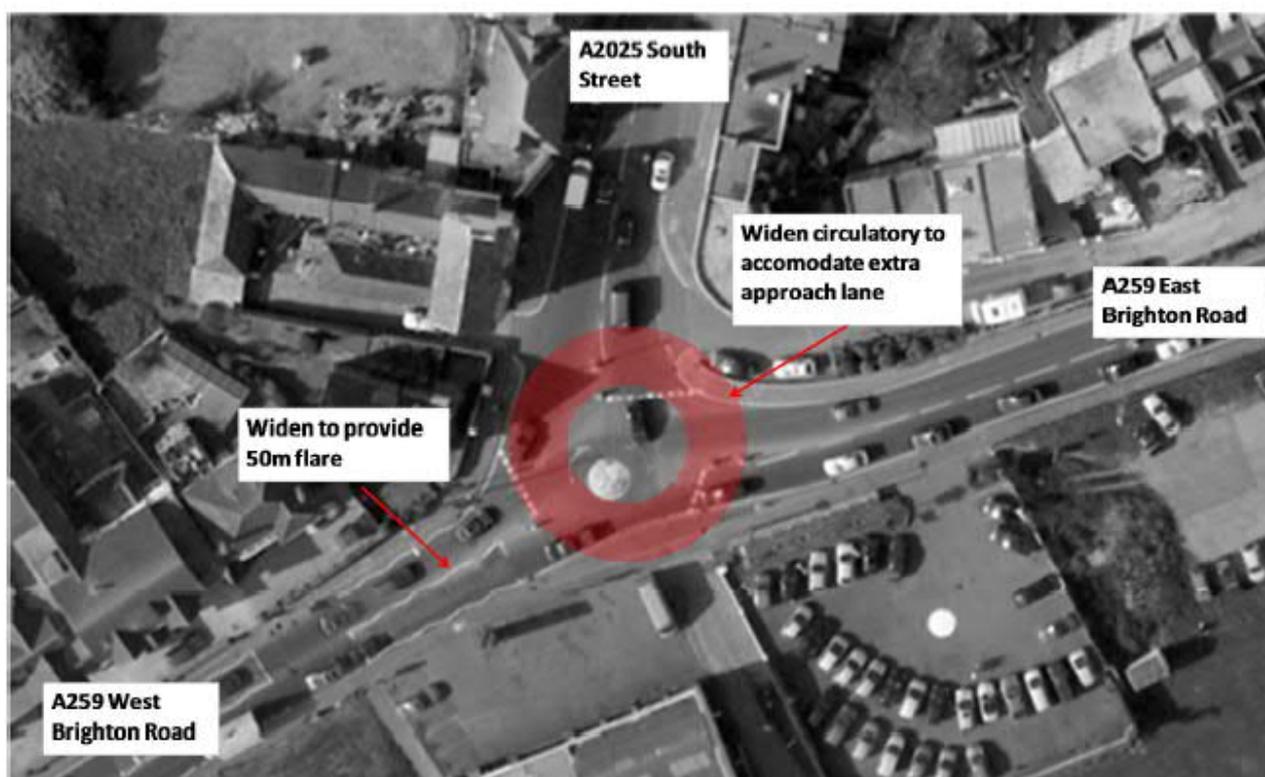
- 1.1.1. This feasibility study builds on previous work undertaken in Phase 1 of the Shoreham Area Sustainable Transport Package (STP) Study.
- 1.1.2. Previous modelling has demonstrated that the existing A259 junction with the A2025 South Street has insufficient capacity for future forecast demand.
- 1.1.3. WSP has been commissioned by West Sussex County Council (WSCC) to investigate the feasibility of upgrading an existing mini-roundabout to a normal¹ roundabout with a 50m effective flare length on its western arm.
- 1.1.4. As part of reviewing the junction's feasibility, a number of constraints and opportunities have been identified to help inform future design.
- 1.1.5. It was found that the proposal in its initial position was not feasible due to the interface of the roundabout with The Terrace private road and limited space available to accommodate a normal roundabout.
- 1.1.6. An alternative positioning has been explored that uses land to the south of the junction. This land is potentially available subject to WSCC negotiation. The additional land facilitates road widening and allows effective pedestrian facilities to be provided. This also prevents interference with The Terrace private road.
- 1.1.7. A high-level cost estimate of the proposal has been produced as an indicative figure to help inform future development decisions. Since it is an early estimate, the actual figure may vary significantly as more information becomes available in future stages of design.
- 1.1.8. A register of the site-specific risks identified can be found in Appendix B.
- 1.1.9. Based on the current information available, the alternative positioning is considered to be feasible, with none of the identified constraints considered likely to prevent the proposal from being pursued. However, further design and investigation is required and may provide new information and additional constraints that may inhibit the proposed scheme.
- 1.1.10. No additional traffic modelling has been undertaken as part of this feasibility study, with this study intended to inform technical issues, in particular in relation to land requirements to facilitate an enlarged roundabout and the longer flare on the western approach to the junction. It is recommended that junction modelling (ARCADY) be undertaken with the proposed design to determine whether the proposed geometry produces the capacity increases that the scheme sets out to achieve. This should be carried out before any additional design work is undertaken.
- 1.1.11. Additional site information will be required to progress design work to the next stage.

¹ A normal roundabout is defined as having a kerbed central island at least 4 metres in diameter (DMRB TD16/07).

2. PROJECT BACKGROUND

- 2.1.1. The Shoreham Area STP Study comprises a package of transport improvements to support growth and to address the forecast impacts from developing housing and employment identified in the Adur Local Plan 2017 and draft Shoreham Harbour Joint Area Action Plan (JAAP).
- 2.1.2. As part of this, the transport infrastructure around Shoreham was assessed in 2016 in the Adur Local Plan Second Addendum: Revised Reissue September 2016 (WSP, October 2016) (ALPSA) to inform future development in the Adur Local Plan. The study highlighted a number of junctions as having insufficient capacity for existing or future forecast demands; or as having safety concerns.
- 2.1.3. The A259 Brighton Road / A2025 South Street mini-roundabout junction was put forward as having insufficient capacity for future forecast demand. The study proposed to mitigate this by widening the road on the western approach to allow a flare with an effective length of 50m. It was proposed to upgrade the existing junction to a 30m diameter 'standard' roundabout to facilitate this. Figure 5.3 in the ALPSA shows an indicative arrangement for this, which has been replicated as **Error! Reference source not found.-1**.

Figure 2-1 – Indicative Arrangement Proposed in the Adur Local Plan Second Addendum



- 2.1.4. WSP has been commissioned by West Sussex County Council (WSCC) to provide a junction feasibility level design and associated costs that allows for additional junction capacity in line with that identified within the previous studies, which also includes safe pedestrian and cycle crossing facilities. No further junction modelling has been undertaken as part of this study.

3. DESIGN SPECIFICS

3.1. ASSUMPTIONS

3.1.1. The following assumptions have been made in carrying out this work:

- The feasibility was initially explored for the arrangement described and shown in the ALPSA. Once the proposed location was found to be undesirable, the position has been adjusted from that shown in **Error! Reference source not found.** to produce an effective solution. By 'standard' roundabout, it is understood this refers to a 'normal' roundabout as defined in DMRB TD16/07;
- Only a roundabout configuration has been explored in detail. Other types of junction may yield improved capacity and safety benefits and have been briefly mentioned later in the report;
- The land to the south (which is currently occupied by Setyres Lancing and Albion Hand Car Wash²) will be available for inclusion as part of the development;
- Existing green space from a part of Lancing Beach Green to the south of the western arm will be available to enable road widening; and
- All information received from WSCC is correct and current, including
 - Highway boundary
 - OS mapping
 - Lancing Vision^{ibid} ambitions.

3.2. SITE VISIT

3.2.1. A site visit was conducted on the 24th April 2018. This involved a site walkover and some measurements were taken of the retaining wall between the A259 and The Terrace.

3.2.2. Observations made during the site visit are included under their relevant headings in Section 4.

3.2.3. A number of queries were raised from the site visit. After discussion with WSCC, the following points were agreed:

- The narrow strip of green space to the south-east of the roundabout is available for inclusion in the design and which is understood to be owned by the landowner of Albion Hand Car Wash; and
- Vehicle access to the south is assumed not to be needed directly from the junction. Vehicle access to the land to the south for the servicing of any future buildings is assumed to be via the Lancing Beach Car Park slightly to the east accessible from A259 Brighton Road, as identified by

² The land occupied by Setyres is occupied under lease from WSCC whereas Albion Hand Car Wash is owned by a third party. Proposals for redeveloping these sites, as initially highlighted in the Lancing Vision, are subject to further discussions with the landowners and businesses occupying the sites.

'Option 3' in the Lancing Vision³⁴. This is subject to further discussion with Lancing Parish Council regarding the current status of the Lancing Vision proposals.

3.3. REVIEW OF TRAFFIC MODELLING

- 3.3.1. It was not within the scope of works to evaluate legacy traffic modelling.
- 3.3.2. However, it should be noted that any design should be supported with relevant junction modelling (ARCADY) in order to ensure that the geometry provides the desired capacity.
- 3.3.3. This is likely to require up to date traffic flow data information for the junction to inform this modelling. It is noted that proposals for the Highways England A27 Worthing – Lancing scheme may significantly impact flows through this junction, so any further ARCADY modelling to be undertaken at the junction will need to consider this.

3.4. ROUNDABOUT GEOMETRY

- 3.4.1. A design was produced that matched the location and description given in **Error! Reference source not found.**: a 30m diameter normal roundabout with a 50m effective flare length on the western approach arm. This initial design is shown in drawing 5552-GA-100 in Appendix A along with the identified constraints with this configuration.
- 3.4.2. It was established that the interaction between The Terrace private road created complications with the horizontal and vertical alignment of the roundabout geometry, which could not easily be resolved by retaining the roundabout in its initial location. These complications are explored in Section 4.2.2.
- 3.4.3. A second design was produced where the roundabout was positioned further south. Additionally, the external diameter was reduced slightly to balance the requirements of:
 - Minimising land taken from the south, due to:
 - The level difference
 - Maximising future usable space
 - Encouraging value engineering;
 - Permitting an effective interface with The Terrace by
 - Allowing some space between the accessway and the roundabout entry
 - Retaining access to The Terrace;
 - Improving traffic capacity above the existing situation;
 - Respecting the built up nature of the area;
 - Considering possible future development to the north and south;
 - Turning requirements of larger vehicles; and
 - The requirements of Non-Motorised Users.

³ Lancing Vision (2012), Adur District Council and Lancing Parish Council (BDP): <https://www.adur-worthing.gov.uk/media/media,98418,en.pdf>

⁴ It is understood that there is an historical underground bunker in the vicinity of this proposed access point which would need to be investigated as part of any wider redevelopment proposals

- 3.4.4. The second configuration is shown in drawing 5552-GA-101 in Appendix A.
- 3.4.5. It should be noted that the arrangement described does not guarantee that the design will be produced to the required junction capacity. For instance, a 50m flare with a very tight entry radius could slow traffic sufficiently to reduce the capacity of the roundabout. No additional traffic modelling has been undertaken as part of this feasibility study and it is recommended that junction modelling (ARCADY) be undertaken with the proposed design to determine whether the proposed geometry produces the capacity increases that the scheme sets out to achieve. This should be carried out before any additional design work is undertaken.

3.5. VEHICLE TRACKING

- 3.5.1. The second configuration design has been tested by undertaking swept path analysis with a large articulated vehicle. The results are shown in drawing 5552-ATR-100 (Appendix A).
- 3.5.2. While this type of vehicle may be uncommon on UK roads, the junction's position along the A259 and proximity to businesses mean that it's possible that very large vehicles will use the junction.
- 3.5.3. The articulated vehicle that was modelled has a more onerous turning requirement than those for other vehicles within the normal maximum dimensions permitted in the current vehicle construction and use regulations. Therefore the swept path analysis demonstrates that the design will accommodate all other anticipated vehicle types.
- 3.5.4. Using the proposed design, swept path analysis showed that an articulated HGV was not able to exit from The Terrace private road onto the roundabout. This was deemed to be acceptable, as this matches the existing situation, and large HGVs are not expected in a narrow residential private road.
- 3.5.5. The proposed design seeks to optimise the space required for more probable vehicle types and has therefore been designed to accommodate a 7.5 tonne box van.
- 3.5.6. Additionally, swept path analysis indicates that an average car can effectively negotiate the proposed roundabout without using the overrun areas.

3.6. VISIBILITY SPLAYS

- 3.6.1. The proposed roundabout's visibility (second configuration) has been analysed according to DMRB TD16/07.
- 3.6.2. The design's visibility was found to be compliant in all but one area, where forward visibility was not achieved 70m back from the northern approach. This is due to the existing on-street parking on South Street obscuring visibility. Drawing 5552-GA-102 in Appendix A shows the visibility splays analysed.
- 3.6.3. This forward visibility issue may require a Departures from Standards Process to be approved. The proposal produced as part of the separate Lancing and Sompting High Quality Cycle route design which is a separate element of the Shoreham Area STP study makes formal provision for this parking. While this does not resolve the visibility issue, the measures are engineered to encourage slower vehicle speeds. Lower speeds reduce the corresponding stopping sight distance required, so the wider proposal should provide an improvement in safety from the existing situation. It is also noted that forward visibility issue exists on the approach from South Street due to the position of South Street parking, which could be relocated as part of proposals for the wider area.

4. CONSTRAINTS AND OPPORTUNITIES

4.1. PARKING

- 4.1.1. Existing on-road parking along South Street is located on both sides of the road, and has an impact on the visibility for vehicles entering the roundabout. This may also affect what manoeuvres are possible in the final design due to the approach and exit angle required to accommodate parking.
- 4.1.2. From the site visit it was noted that a number of vehicles were parked on double yellow lines in close proximity to the roundabout. If left unaddressed, this will exacerbate visibility and accessibility issues.
- 4.1.3. To address undesired on-street parking, it is proposed to form a build-out in front of the existing public house. The lack of space remaining on the carriageway will discourage parking, as parking would block the carriageway. Furthermore, the build-out will not inhibit visibility. A build-out also presents an opportunity for streetscape improvements such as trees (set back to retain visibility), benches or planters.

4.2. 'THE TERRACE' PRIVATE ROAD

- 4.2.1. The Terrace is a private access road to a number of properties with a view to the sea. It also has designated on-road parking. Access is provided from both South Street and East Street. The road runs parallel and adjacent to Brighton Road. The Terrace is 0.7-1.2m higher than Brighton Road in the vicinity of the roundabout, and is separated from Brighton Road by a retaining wall.
- 4.2.2. The proposed roundabout for the arrangement shown in **Error! Reference source not found.** would interface directly with The Terrace, effectively providing the roundabout with an additional arm. The feasibility drawing does not show The Terrace as an additional arm because this arrangement was found not to be desirable to pursue, for the following reasons:
- Levels - to tie into existing levels, some existing parts of the road would have to be raised approximately 1m. If this is done over a short distance to minimise works, it risks vehicles grounding. If it is done over a larger distance for a more gradual gradient, this would notably increase the complexity of the design, in order to tie in with other accesses in the vicinity and to ensure adequate drainage and visibility. Without any levels information available and with the complexities involved, it was not considered appropriate to examine this design in depth at a feasibility stage;
 - Swept path analysis – with the arrangement shown in 5552-GA-100 (Appendix A), it is not possible for vehicles larger than a private car to manoeuvre from The Terrace to Brighton Road using the first exit, thus having to turn right and complete a full circulation of the roundabout to head east;
 - Highway ownership - as a private road, it does not appear to be possible to modify the approach from The Terrace safely within the highway land available. It may still be possible to change the layout with additional permissions/land purchase. This issue may be exacerbated if the highway boundary received is erroneous (see boundary constraints, below); and
 - Geometry - given the narrow spacing between South Street, The Terrace and Brighton Road, a standard circular roundabout may not allow the entrances/exits sufficient space for safe

access/egress, or may lead to wide sections of road that encourage high speeds or driver confusion. A non-circular roundabout could mitigate this.

- 4.2.3. It may be possible to adapt The Terrace to connect directly into South Street, as existing. However, with the roundabout entry arm being positioned further north, this may bring the approach unacceptably close to The Terrace access and raise concerns about driver confusion and visibility.
- 4.2.4. To avoid disrupting The Terrace and the existing retaining wall, it was proposed to position the roundabout further to the south.
- 4.2.5. To improve safety further, access to the roundabout from The Terrace can be removed. This could be achieved by designating The Terrace as a cul-de-sac so that access is only served from East Street. Alternatively, an eastward one-way system could be enforced. These options have not been pursued in the design shown in drawing 5552-GA-101 (Appendix A).
- 4.2.6. It is proposed to use high-contrast surfacing or paving across accesses to raise awareness of pedestrians. It is noted that paving is likely to be more resource intensive as a design solution in terms of ongoing maintenance costs, so a high contrast surfacing treatment is likely to be more desirable.
- 4.2.7. Additionally it is proposed to reduce the width of The Terrace access to facilitate a shorter and more direct crossing, and provide access to the proposed shared use footway for cyclists. Swept path analysis indicates that light goods vehicles will still be able to turn left from The Terrace to join the eastbound A259 with this arrangement. This proposal will need to be addressed through public consultation with local stakeholders in the next stages of design for any proposal taken forward.

4.3. BAR/RESTAURANT ACCESS

- 4.3.1. Opposite The Terrace, there is an additional access drive to The New Sussex Hotel bar/restaurant. It appears that this access would not need to be modified with the proposed layout. However it would be desirable for vehicles to be restricted to left turns for access and egress due to proximity with the roundabout. This proposal will also need to be addressed through public consultation with the local business in the next stages of design for any proposal taken forward.

4.4. BURIED SERVICES

- 4.4.1. Record plans received from WSCC reveal a number of buried services which may be affected by any junction improvements. These include:
 - SGN Medium Pressure Gas Main (MPGM) in Brighton Road;
 - SGN Low Pressure Gas Main (LPGM) in the footway of South Street and Brighton Road, and also located in The Terrace;
 - UK Power Network (UKPN) Low Voltage (LV) underground electrical cable in both South Street footways, The Terrace and the northern footway of Brighton Road;
 - UKPN High Voltage (HV) underground electrical cable in the connecting footway from South Street to Brighton Road western (east-bound) approach;
 - Southern Water water supply main in Brighton Road and South Street;
 - Southern Water foul sewer in South Street, Brighton Road and a parallel sewer located in the southern footway of Brighton Road;

- BT Openreach (BT) telecommunication cables in both South Street footways, The Terrace, a connection across the existing roundabout to SE tyres, and the northern footway of Brighton Road; and
- Virgin Media (VM) ducts (assumed to include fibre optic cables) in both South Street footways and both Brighton Road footways.

4.4.2. Utilities which are more likely to require protection or diversion are the services currently located in the existing footway that would be located in the proposed carriageway. These utilities include:

- The BT Openreach telecommunications connection to the existing garages to the south;
- The SGN Low Pressure gas connection to the existing garages to the south;
- At least 100m of Southern Water Foul sewer;
- The Southern Water main connecting the existing garages to the south;
- The UKPN LV connection to the existing garages to the south;
- Approximately 40m of UKPN LV underground cable in the vicinity of the existing pelican crossing;
- At least 100m of VM telecommunications ducts; and
- The VM telecommunications ducts supplying the restaurant to the south.

4.4.3. The existing pelican crossing will need to be replaced as part of the proposed works. As such, any underground cabling and its supplying feeder pillar will require moving.

4.4.4. As with any regrading works, all manhole and service covers would need adjusting to the new road profile and replacing with skid resistant cover with a Polished Skid Resistance Value (PSRV) ≥ 45 in accordance with BS 9124 if they are not compliant.

4.4.5. Depending on where any designs for the waterfront are in planning, it may be beneficial to phase any proposed works to the junction with any utility upgrades or extensions required for forthcoming developments to the south.

4.5. BOUNDARY CONSTRAINTS

4.5.1. It should be noted that the highway boundary plans received do not match the demarcation across The Terrace visible on the site visit. If the boundary is taken from the physical demarcation, this will affect the options available for access to The Terrace. This inconsistency has been avoided by repositioning the proposed roundabout to the south.

4.5.2. It should also be noted that it is not possible to achieve a 50m-long flare on the western approach without obtaining additional land from Lancing Beach Green to the south of the approach.

4.6. EXISTING LEVELS

4.6.1. The existing mini-roundabout appears to fall to the south. South of the roundabout, the gradient becomes steeper toward the existing garage and to the south of the western roundabout arm. The proposals for enlarging the junction should take into account these falls and tie in with surrounding levels, in order to avoid unnecessary cost with retaining structures.

4.6.2. One notable constraint is the existing public footpath which passes south of the western roundabout arm. To retain an accessible gradient it may be necessary to raise the existing footpath further to the south in order to tie in with the new road levels at the top of the path, which may be higher. This would need to be addressed during a future design stage.

4.7. DRAINAGE

- 4.7.1. The existing junction drains to the south to gullies, which are assumed to drain to the existing Southern Water sewer in the vicinity. The proposals are expected to marginally increase the contributing impermeable area to the existing network. Whether the existing system has capacity for increased runoff will need to be investigated further at a future design stage. There may also be an opportunity to use Sustainable Drainage Systems (SuDS) such as tree pits or permeable paving as part of any streetscape improvements in the vicinity of the junction.

4.8. PROVISION FOR PEDESTRIANS

- 4.8.1. The pavement's visual condition in vicinity of the roundabout is noted to be particularly poor. Any upgrade to the junction presents an opportunity to resurface nearby pavements, improving the streetscape.
- 4.8.2. There may be opportunity to remove street clutter from the vicinity. The need and location for the bin, existing signage and the telephone box in the vicinity of the junction could be reviewed.
- 4.8.3. Other than the pelican crossing on the western arm, the existing junction has no formal crossings for pedestrians. Pedestrian islands have been provided on the northern and eastern arms. However, at these locations pedestrians must cross a large distance (up to 7.5m) and no tactile paving is provided for the benefit of sight-impaired footway users. The central islands provided are approximately 1.2m wide, which is the minimum specified in LTN 2/95.
- 4.8.4. It is proposed to formalise the uncontrolled crossings by deploying tactile paving according to best practice, increasing the width of pedestrian islands and reducing the distance which pedestrians need to cross where possible.
- 4.8.5. One location where it is not possible to reduce the distance pedestrians cross is on the eastern arm. This is due to the swept path requirements of articulated vehicles turning east from South Street. The crossing distance could be reduced by relocating them to the east; however this moves the crossing further from pedestrian's desire line, and so is not recommended.
- 4.8.6. Given the high traffic flows experienced at times, there may be justification to propose signalised pedestrian crossings, or zebra crossings as recommended by DMRB TD16/07 for a category 8 roundabout in Table 6/1. However, any crossing that provides priority for pedestrians will affect the capacity of the junction, and as stated above, the need to set such facilities back from the junction give way line means that such facilities may not address pedestrian desire lines.
- 4.8.7. It is also proposed to deploy high-contrast surfacing or paving across the carriageway where pedestrians are likely to cross. This may encourage drivers to exercise more caution by raising awareness of people crossing. As noted above, paving is likely to be more resource intensive as a design solution in terms of ongoing maintenance costs, so a high contrast surfacing treatment is likely to be more desirable.

4.9. PROVISION FOR CYCLISTS

- 4.9.1. There is currently no formal provision for cyclists at the junction. The guidance for cyclist provision at roundabouts varies depending on the expected traffic flows. Table 1 below gives an indication of the daily traffic flows and speeds at the junction, which have been compiled from the WSCC Traffic Monitoring Database using the available records in the vicinity of the junction.

Table 4-1 – Local Traffic Count Data

	Permanent ATC – 2017 Data A259 Lancing, Brighton Road (west of The Broadway)	16 – 21 June 2008 A259 near Eastern Car Park	13 – 15 Sept 2006 South Street near Penhill Road	1 – 3 June 2006 A259 near Lancing Park
5 Day 24 Hour Average	20,910	17,794	12,785	27,704
85%tile Speed	N/A	35.7	29.4	35.3

- 4.9.2. The data represent different periods of time and some of the data is approximately ten years old. However, they are sufficient to demonstrate that the junction experiences more than 8,000 or 10,000 vehicles a day, at which point it is recommended that cyclists are segregated from traffic at a roundabout (DMRB TA 91/05 and Sustrans, respectively).
- 4.9.3. Since national trends have seen a steady increase in traffic volumes, it is probable that the present-day situation, for the sites with older data above, has more traffic than the historic figures shown; however more recent data is required to determine whether this is true at the specific locations.
- 4.9.4. One option to improve provision for cyclists is to produce a 'continental'-style roundabout, where cyclists are segregated from pedestrians with sharp entry radii for vehicles. This is not considered appropriate for this context for three reasons:
- This scheme was devised to examine the feasibility of improving the junction to cater for increased future traffic demand; not to maximise streetscape improvements. A continental roundabout may adversely affect capacity and therefore not fulfil the initial rationale for the scheme;
 - The turning requirements of articulated HGVs (which are expected at this location) require large entry radii. This does not lend itself to a traditional continental roundabout; and
 - It is desirable to minimise the amount of additional space taken from the south-western grass bank due to the level difference and impacts on Lancing Beach Green. Shared-use facilities on both sides of the road (as proposed) requires up to 5.5m from this area. High quality segregated provision for cyclists could increase the extent of additional land required by a further 2m.
- 4.9.5. Another option could be to use cycle lanes or light segregation for cyclists on the roundabout. However, DMRB states that there is insufficient evidence for British design standards to support on-road segregation on roundabouts amid reported safety concerns.
- 4.9.6. As such, it is proposed to make the surrounding footways shared use for cyclists, widen to 3m where possible and provide associated connectivity for cyclists to the road where the shared-use facilities terminate. This is a compromise between minimising the additional space required for the junction, retaining capacity improvements for vehicles, and providing infrastructure for pedestrians and cyclists around the junction.
- 4.9.7. It has not been possible to widen the shared use path immediately adjacent to the retaining wall due to the swept-path requirements of a large HGV turning east from South Street, and the desire to avoid modifying the existing retaining wall. The existing 2m-wide footway is considered acceptable

for shared use across this short distance and the low number of pedestrians observed to be using the footway. This is below the minimum effective width for short sections of shared use path which would typically be 2.5m so may require a Departure from Standards process to be completed.

- 4.9.8. It should be noted that this shared-use option does not provide the most direct route for cyclists. While safer than remaining on the carriageway, the indirect route around the junction is inconvenient and may be not be used by experienced riders.
- 4.9.9. Table 4-3 describes the proposed movements for cyclists with the proposed layout.

Table 4-2 – Cyclist Movements at Proposed Roundabout

From \ To	North	West	East
North		Cyclists join shared footway, cross Brighton Road using uncontrolled crossing, join shared-use path and rejoin road after roundabout.	Cyclists join shared path before rejoining the carriageway
West	Cyclists join shared-use path using ramp before joining South Street after roundabout		Cyclists use ramp to join shared path, cross South Street using uncontrolled crossing and then rejoin road after roundabout
East	Cyclists join shared-use path using ramp, cross Brighton Road and South Street at the uncontrolled crossings and rejoin road	Cyclists use ramp to join shared-use path, rejoin road after roundabout.	

- 4.9.10. The footway to the north and south of the western arm is proposed to be upgraded to shared use. Therefore, it is proposed to upgrade the existing controlled crossing on the western arm to a toucan crossing. This would be expected to be used by cyclists approaching from the west that intend to access the seafront to the south; or used by cyclists from the south wishing to go north along South Street.

- 4.9.11. Additional cycle provision for these experienced riders could be provided in the form of a cycle-only roundabout exit to the shared-use path/cycleway to the south. This could help improve connectivity with future development to the south.

4.10. SIGNALISED JUNCTION

- 4.10.1. Given the high traffic flows that this junction experiences, capacity and safety could possibly be improved with a signalised configuration. This may provide the opportunity for safer and more user-friendly pedestrian and cyclist crossing facilities to be provided closer to the desire lines across the junction (for example in terms of accessing Lancing Beach Green from South St), however an appropriate balance will need to be found between signals prioritising vehicle movements versus pedestrians and cyclist movements. Junction modelling would be required to test this. It is also noted that signalisation is likely to increase traffic queues and delay at off-peak times, and in particular result in additional traffic queuing in South Street on approach to the junction which may not be desirable from a public realm and air quality perspective. Since this option is outside the scope of this feasibility study, it has not been explored in depth.

4.11. SHARED SPACE

- 4.11.1. An alternative solution may be to consider a shared space design for the junction. Whilst the scope does not include investigating this further, a shared space proposal appears to be in keeping with the 2012 Lancing Vision for Beach Green and the surrounding area, and could potentially provide capacity, aesthetics and safety benefits. However, in July 2018 it is noted that the Department for Transport wrote to local authorities⁵ to ask them to pause the introduction of Shared Space schemes following the publication of the Government's Inclusive Transport Strategy. This is so further research can be undertaken and updated guidance about shared space scheme can be produced because of mixed views about the impacts of shared space schemes.

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/731154/inclusive-transport-strategy-letter.pdf

5. COSTING

- 5.1.1. As part of this feasibility design process, cost estimates for these works have been prepared with a breakdown provided in Appendix C.

6. CONCLUSIONS

- 6.1.1. This feasibility study has demonstrated that it is feasible to upgrade the existing South Street - A259 junction to a normal roundabout within the existing constraints identified.
- 6.1.2. Some notable design risks⁶ were identified and should be addressed further in future design stages. These risks include:
- The presence of utilities;
 - Acquisition of land to the south;
 - Existing slopes to the south;
 - Additional impermeable area contributing to the existing drainage system;
 - Junction safety in proximity to parking and accesses; and
 - The design has not been remodelled at this stage to confirm that the capacity benefits of the scheme can be achieved.
- 6.1.3. The feasibility report has also noted a number of related opportunities which could be developed alongside the junction improvements, including:
- Improving pedestrian crossings by reducing the crossing distance and providing the necessary tactile surfaces;
 - Improving pavement conditions by resurfacing;
 - Removing redundant street furniture (e.g. telephone box, unnecessary signage);
 - Improving cycle infrastructure with off-road shared-use paths;
 - Consideration of streetscape improvements to link South Street with the waterfront; and
 - Adding turning restrictions to The Terrace and the access to the New Sussex Hotel.
- 6.1.4. It is recommended that junction modelling (ARCADY) be undertaken with the proposed design using up to date traffic flow information to determine whether the proposed geometry produces the capacity increases that the scheme sets out to achieve.

⁶ A full project management risk register has not been completed at this stage. Full consideration of political, economic, social, technological, legal and environmental risks is recommended at the next design stage.

Appendix A

FEASIBILITY STUDY DRAWINGS

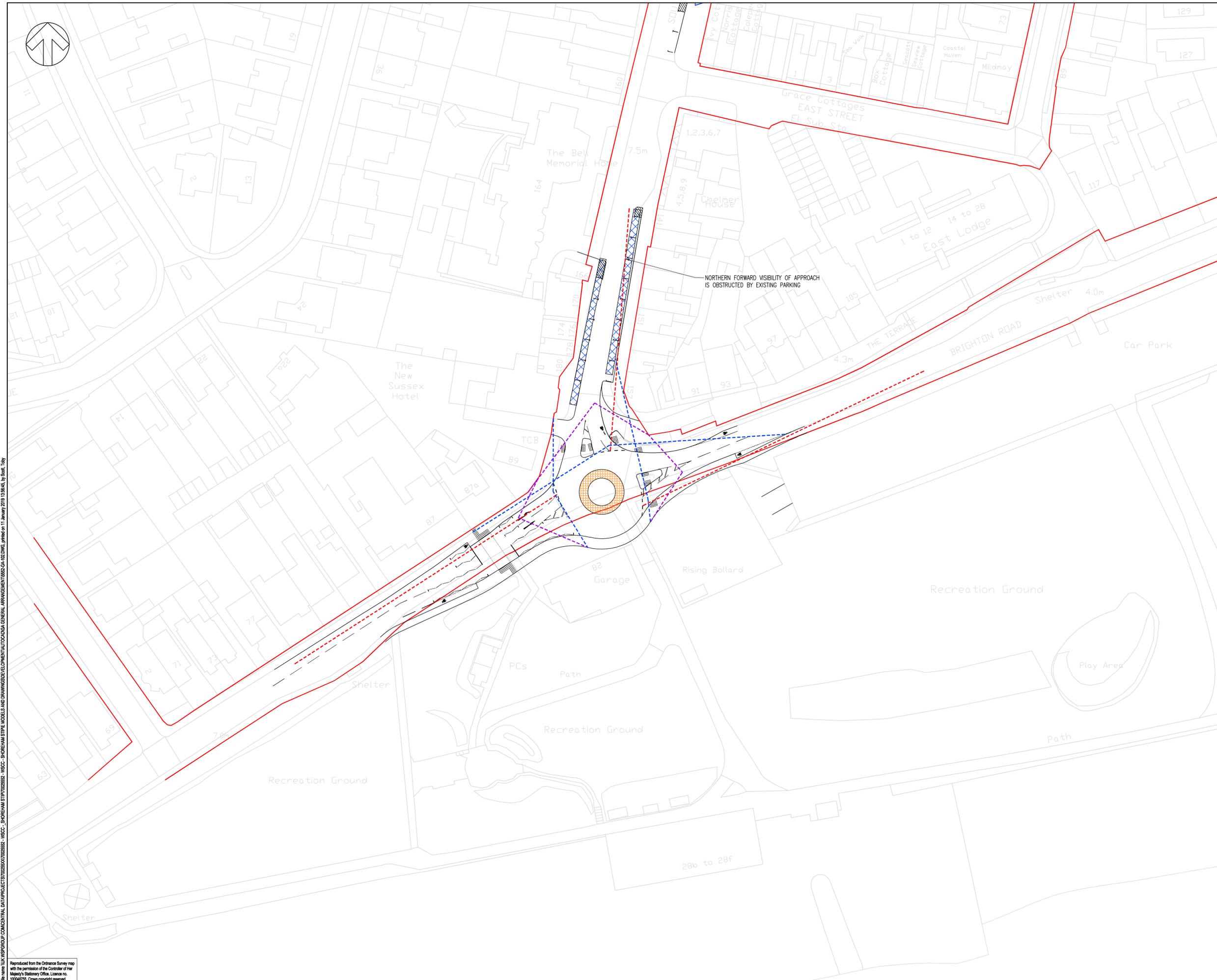




DO NOT SCALE

- NOTES
1. FEASIBILITY DESIGN BASED ON OS MAPPING.
 2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTATION, DRAWINGS AND STANDARD DETAILS.
 3. CONFLICTING INFORMATION SHOWN ON THE ENGINEER'S DRAWINGS OR DISCREPANCIES BETWEEN THE INFORMATION GIVEN BY THE ENGINEER AND THAT PROVIDED BY OTHERS MUST BE REFERRED TO THE ENGINEER BEFORE THE WORKS COMMENCE.
 4. DIMENSIONS SHALL NOT BE SCALED FROM THIS DRAWING.
 5. VISIBILITY SPLAYS MEET THE REQUIREMENTS OF DMRB TD16/07 WITHIN MODIFIED HIGHWAY BOUNDARY OF PROPOSAL, EXCEPT NORTHERN FORWARD APPROACH VISIBILITY DUE TO EXISTING PARKING.

- KEY
- EXISTING AREA USED FOR ON-STREET PARKING
 - PROPOSED OVERRUN AREA
 - HIGHWAY BOUNDARY
 - 90m FORWARD VISIBILITY ON APPROACH
 - FORWARD VISIBILITY SPLAY 15m FROM GIVE WAY
 - VISIBILITY SPLAY AT ENTRY



NORTHERN FORWARD VISIBILITY OF APPROACH IS OBSTRUCTED BY EXISTING PARKING

B	11/01/2019	TPS	LAYOUT ADJUSTED SLIGHTLY FOR CYCLISTS	AW5	BJ
A	20/06/2018	TPS	FIRST ISSUE	AW5	CB
REV	DATE	BY	DESCRIPTION	CHK	APP

DRAWING STATUS: S2 - FOR INFORMATION

Regus House, Southampton Int. Bus. Park, George Curl Way, Southampton, SO18 2RZ, UK
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wsp.com

CLIENT: WEST SUSSEX COUNTY COUNCIL

ARCHITECT: -

SITE/PROJECT: SHOREHAM STP PHASE 2 SOUTH STREET JUNCTION

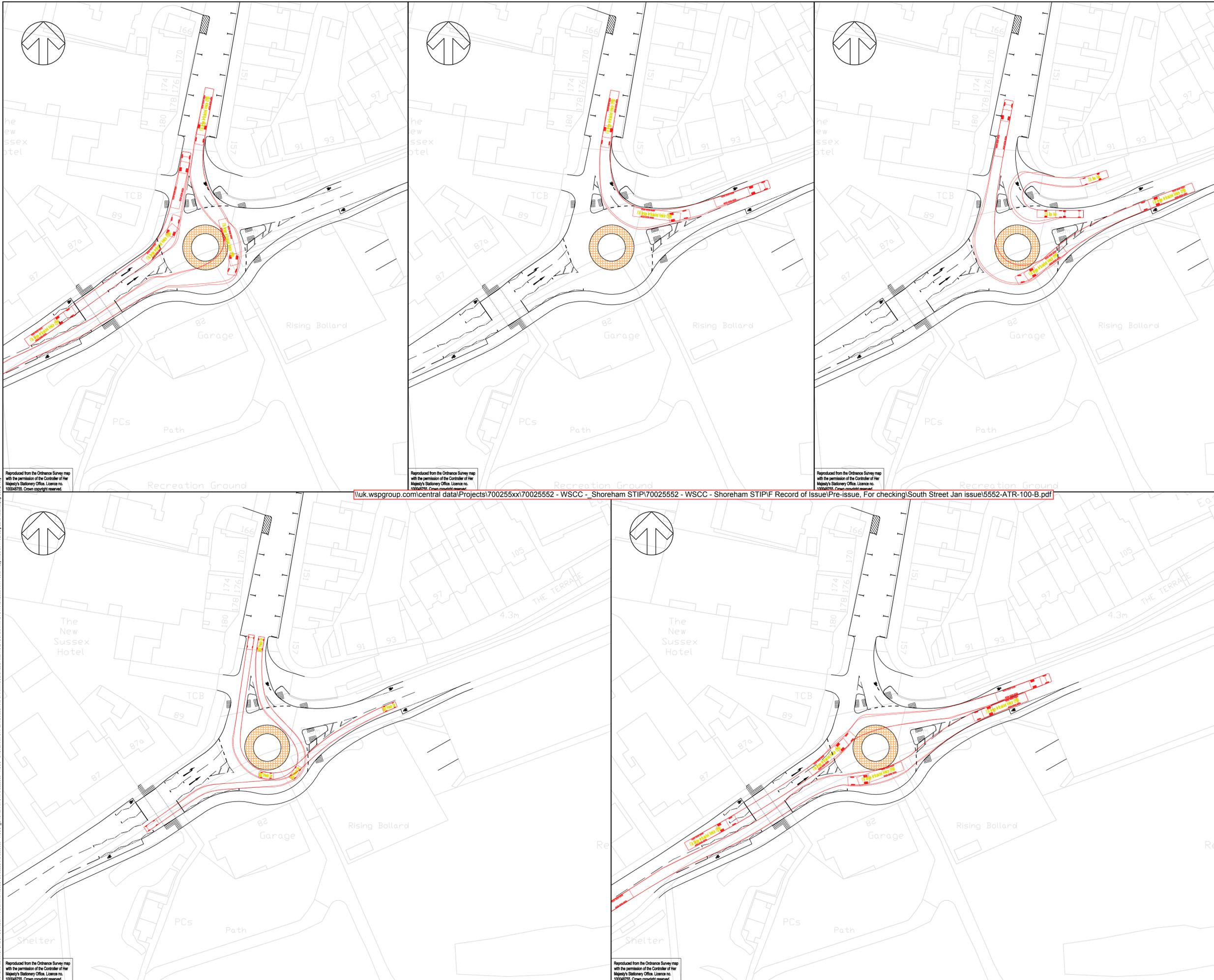
TITLE: FEASIBILITY DESIGN VISIBILITY SPLAYS

SCALE @ A1:	1:500	CHECKED:	AMS	APPROVED:	CB
PROJECT NO:	70025552	DESIGNED:	TPS	DATE:	June 18

DRAWING NO:	5552-GA-102	REV:	B
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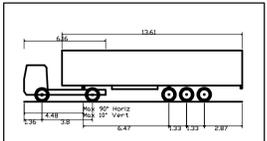


DO NOT SCALE

- NOTES
1. FEASIBILITY DESIGN BASED ON OS MAPPING.
 2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTATION, DRAWINGS AND STANDARD DETAILS.
 3. CONFLICTING INFORMATION SHOWN ON THE ENGINEER'S DRAWINGS OR DISCREPANCIES BETWEEN THE INFORMATION GIVEN BY THE ENGINEER AND THAT PROVIDED BY OTHERS MUST BE REFERRED TO THE ENGINEER BEFORE THE WORKS COMMENCE.
 4. REQUIRED PROVISION FOR NON-MOTORIZED USERS TO TIE IN WITH LANCING & SOMPTING CYCLE DESIGN TO THE NORTH (DRAFT ARRANGEMENT SHOWN).
 5. ARRANGEMENT SHOWN IS INDICATIVE ONLY AND WILL REQUIRE ADDITIONAL DETAILED DESIGN TO COMPLY WITH LOCAL/NATIONAL GUIDANCE AND STANDARDS.
 6. ALL CARS TRACKED AT 20mph. VAN AND HGVS TRACKED AT 10mph.

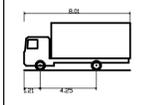
KEY

PROPOSED OVERRUN AREA



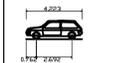
ETA Design Articulated Vehicle (199B)

Overall Length	16.480m
Overall Width	2.520m
Overall Body Height	3.270m
Min. Body Ground Clearance	0.210m
Max. Track Width	2.470m
Lock to lock time	3.00s
Kerb to Kerb Turning Radius	6.550m



7.5t Box Van

Overall Length	8.010m
Overall Width	2.100m
Overall Body Height	3.350m
Min. Body Ground Clearance	0.250m
Track Width	2.000m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.400m



DB32 Private Car

Overall Length	4.223m
Overall Width	1.715m
Overall Body Height	1.350m
Min. Body Ground Clearance	0.230m
Max. Track Width	1.650m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	5.700m

REV	DATE	BY	DESCRIPTION	CHK	APP
B	11/01/2019	TPS	LAYOUT ADJUSTED SLIGHTLY FOR CYCLISTS	AMS	EJ
A	20/06/2018	TPS	FIRST ISSUE	AMS	CP

DRAWING STATUS: S2 - FOR INFORMATION

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ARCHITECT: -

SITE/PROJECT: SHOREHAM STP PHASE 2 SOUTH STREET JUNCTION

TITLE: FEASIBILITY DESIGN SWEEP PATH ANALYSIS

SCALE @ A1: 1:500	CHECKED: AMS	APPROVED: CB
PROJECT NO: 70025552	DESIGNED: TPS	DATE: June 18

DRAWING NO: 5552-ATR-100

REV: B

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http://uk.wspgroup.com/central_data/Projects/700255xx/70025552 - WSCC - Shoreham STPI/70025552 - WSCC - Shoreham STPI/F Record of Issue/Pre-issue, For checking/South Street Jan issue/5552-ATR-100-B.pdf

Appendix B

T446: DESIGN RISK MANAGEMENT
SCHEDULE



Appendix C

SCHEME COSTINGS





WSP
Feasibility Estimate review 13/12/18

Scheme Name/Reference: 70025552 Shoreham STP Phase 2 South Street Junction

		Dec-18 WSP Review
		Costs
General Construction Cost Estimate		
Series 200: Site Clearance (Removal of paving,kerbs,signs , etc.)	£	7,945.50
Series 300: Fencing	£	2,191.44
Series 400: Road Restraint Systems(Pedestrian guardrailing, vehicular restraint systems)	£	3,883.20
Series 500: Drainage and Service Ducts	£	26,398.57
Series 600: Earthworks & Excavation	£	39,331.92
Series 700: Carriageway Construction	£	100,953.15
Series 1100: Kerbs, Footways and Paved Areas	£	29,705.00
Series 1200: Traffic Signs, Traffic Signals and Road Markings	£	82,875.94
Series 1300: Street Lighting	£	13,000.00
Series 3000: Landscaping and Ecology	£	3,226.00
Works Sub total	£	309,510.72
Add Items of construction contingency for items not identified and precise detail/spec	5%	£ 15,475.54
Add 15% for working in and around live c/way	15%	£ 48,747.94
Add Preliminaries/TM and OH & P	35%	£ 130,806.97
Construction cost estimate @ 4Q'18 Prices	£	504,541.16
ADD Other considerations		
Work by Statutory undertakers and others	allowance	£ 200,000.00
Survey/Investigate/Design/Procure/Supervise/manage & liase	20%	£ 100,908.23
Land cost - 90m2 @ £540.50 per sq m	90 m2	£540.00 £ 48,600.00
Land costs - 90m2 - additional inflation cost to 2018 assuming 2% inflation	2%	£ 972.00
Approximate Indicative Total Budget Estimate excl Risk, Optimism Bias & Inflation		£ 855,021.40
Risk /Optimism Bias	44%	£ 376,209.41
Approximate Indicative Total Budget Estimate excl Inflation		£ 1,231,230.81
Inflation allowance assuming construction takes place in 2023	15%	£ 184,684.62
Final Total		£ 1,415,915.43

LIST OF EXCLUSIONS AND PRICING NOTES

Exclusions

VAT
Legal issues

Pricing notes

Review of base estimate is at 4Q 2018 prices

June '18 quantities were measured from drawing nr 5552-GA-101B and have been taken as correct for the purposes of this review

Disproportionately high STATS diversion costs are anticipated due to number and type of STATS likely to be affected by works - assumed £25k for each of the 8 identified STATS

Land cost provided by WSCC based on 'Land Values for Policy Appraisal', MHCLG, May 2017 - Adur residential value assumed - WSCC to investigate further

Assumed £60k cost for relocating/provision of toucan crossing added to Series 1200 summary



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