

Report to Norwich Highways Agency committee
18 January 2018

Report of Head of city development services

Subject Transport for Norwich – Angel Road / Waterloo Road
cycling improvements

Item

7

Purpose

To consider responses from the first and second consultations and approve further advertising and consultation on the Angel Road / Waterloo Road cycling improvements scheme.

Recommendation

To:

- (1) agree the retention of the existing signalised crossing on Waterloo Road north of the junction with Angel Road.
- (2) ask the head of city development services to carry out the necessary statutory legal procedures to:
 - (a) advertise and consult on the revised proposals for traffic calming on Waterloo Road and Angel Road as shown on plans PE4122-CO-012 to 016, including the cycle lane on Waterloo Road;
 - (b) confirm the traffic regulation order to install a 30 minute waiting area outside nos.126/128 Waterloo Road;
- (3) delegate consideration of any comments received from the consultation to the head of city development services, in discussion with the chair and vice chair of this committee.

Corporate and service priorities

The report helps to meet the corporate priority a safe, clean and low carbon city

Financial implications

£320,000 to be funded from the City Cycling Ambition Grant and £20,000 from the local safety scheme budget

Ward/s: Catton Grove, Mile Cross and Sewell

Cabinet member: Councillor Stonard - Sustainable and inclusive growth

Contact officers

Linda Abel senior transportation planner

01603 212190

Joanne Deverick transportation and network manager

01603 212461

Background documents

None

Report

Background

1. This cycle improvement scheme covers part of the yellow pedalway from Heath Road, to Shipstone Road and onto Angel Road and Catton Grove Road, including part of a neighbourhood route on Waterloo Road from its junction with Magpie Road to its junction with Angel Road.
2. At the Norwich Highways Agency Committee (NHAC) meeting on 24 November 2016, members agreed to consult on the Angel Road / Waterloo Road cycle improvement scheme proposing two options for the junction of Angel Road / Waterloo Road and requesting the public to choose their preference between the two options. These options were;
 - Option 1: retain a signalled crossing in the current location but convert it to a toucan crossing with shared used footpath / cycle paths on all approaches, and
 - Option 2: replace the signalled crossing with a zebra crossing with a parallel cycle crossing and to introduce a second zebra / cycle crossing on Waterloo Road to the south of the Angel Road junction again with shared use footpath / cycle paths on the approaches.
3. The report also included proposals for a speed reducing table at the junction of Elm Grove Lane and Angel Road, improvements on the closed section of Shipstone Road and amendments to the kerb radius on the corner of Waterloo Road and Angel Road.
4. A report was prepared for the NHAC meeting on 16 March 2017 informing the results of the consultation. However, this was not debated at the meeting as councillors requested prior to the meeting that further consultation was carried out.
5. Despite the original report not being debated, officers took the opportunity to consider the responses received to the original consultation, and to revise the design to remove as many of the objections as possible prior to undertaking further consultation. This resulted in a third option being developed, which removed the shared use footpaths and cycle-paths and retained all cycle movements on the carriageway. This report covers the consultation on that option which consists of two zebra crossings on Waterloo Road, either side of the junction with Angel Road along with junction realignments and also the proposed raised table at the junction of Angel Road and Elm Grove Lane. The proposals are shown on appendices 1 & 2.

Public consultation

6. The consultation period for the revised scheme was 28 July to 22 August 2017.
7. Details of the proposal were advertised in the local press, road notices were erected, statutory consultees and transportation consultees were directly informed. Local residents and businesses were written to and details were posted on the web sites of Norwich City Council and Norfolk County Council.

Responses

8. Fourteen responses were received to the consultation.
9. Four responses objected to the removal of the signalised crossing and replacement with two zebra crossings, three agreed with the whole scheme and others had concerns for some aspects. Councillor Julie Brociek-Coulton, local ward member, requested that the survey she carried out for the first consultation for options one and two be considered for this report too.
10. A summary of all responses to this second consultation can be found in Appendix 3.
11. Six responders were in favour of replacing the one signalised crossing with two zebras, but one resident objected to the raised table outside their property as they considered it would generate traffic noise. Three responders were concerned with the removal of the traffic island that works informally as a pedestrian refuge on Angel Road at the junction.
12. The Norwich Cycling Campaign gave a considered response with support for the scheme with suggestions to improve and Norfolk Living streets also supported the scheme but were concerned with the removal of the traffic island on Angel Road.
13. The Norfolk and Norwich Association for the Blind (NNAB) gave a response to the proposals of wishing to see a signal controlled crossing retained, advising these are vital for visually impaired people (VIP) allowing them to cross roads confidently when they are unable to use the visual clues available to the wider population.
14. The petition from Sewell ward councillors during the first consultation obtained mainly from parents with children at nearby schools, has 89 signatures supporting a signalised crossing (option 1), but with an additional raised table. Petitions have to be considered with the assumption that each individual signature is usually given quickly without full knowledge of the situation. In this case, the whole scheme with 20mph zone, traffic calming and the alternative option of two zebras at the crossing does not appear on the statement. Acknowledging this, it is still a large "vote" for the retention of a signalised crossing.
15. The two councillors who responded directly, objected to the removal of the signalised crossing and the removal of the traffic island on Angel Road. They consider that not only is a traffic signal crossing safer for pedestrians to use at this junction, but the signals help the flow of traffic at this T junction during peak traffic flow times. They both consider this would not happen if the crossing was replaced with a zebra crossing.
16. One objection to the proposed 30 minutes parking area on Waterloo Road outside Nos.126/128 was received from Cllr Julie Brociek-Coulton. The reason given was that parked cars would hold up the traffic and cause congestion. A shorter time of 15 minutes was suggested.
17. Two responses, including Cllr Steve Morphew, objected to the raised table proposed for the junction of Angel Road with Elm Grove Road on the basis that the design was over engineered and not appropriate.

Considerations

18. The original consultation on Options 1 and 2 gave an almost 50/50 split on those that wanted to see a signalled crossing retained (but modified to a Toucan) as opposed to two zebra crossings with cycle crossing facilities. One of the main concerns raised in the first consultation was the suitability of the footpaths in the area to become shared use. The footpaths are relatively narrow with some very tight corners. Another concern was the size of the raised table at the road junction of Waterloo Road and Angel Road. Some concerns were stated that VIPs find it difficult to detect the edge of the footpath and can lead them walking unintentionally into the road. It was decided to revisit the original proposals to see how the main concerns could be alleviated while achieving benefits for cyclists, especially on the yellow pedalway. It was therefore decided to omit the shared use cycle paths and keep cyclists on the carriageway, in a traffic calmed 20mph area. The option of two zebra crossings on Waterloo Road either side of the Angel Road junction, both of which will be on individual speed tables was chosen for consultation.

Loss of signalled crossing

19. The existing signalled pedestrian crossing was installed in 2004 and it has an anticipated life span of around 20 years. Signalled crossings delay the travel of pedestrians unnecessarily and do not give priority to pedestrians in residential 20mph areas.
20. A pedestrian crossing assessment was undertaken by Norfolk County Council on the replacement of the signalled crossing with two zebra crossings. The result of that assessment was very finely balanced as to which option was preferable, but the report concluded the signalised crossing was marginally the better option due to the proximity of the NNAB offices in Magpie Road. However that report only considered the effects on pedestrians. When considering the implications for cyclists the provision of two zebra crossings on raised tables will have a significantly higher impact on reducing vehicle speeds in the area and therefore improving the environment for cyclists. Additionally, the pedestrian crossing report did not consider that further traffic calming measures are proposed on Waterloo Road to reduce vehicle speeds further.
21. Concern has been expressed that without the signalled crossing on Waterloo Road, drivers will find it difficult to get out of Angel Road, particularly those turning right. In reality, with two zebra crossings, more breaks in the traffic will be created in the traffic on Waterloo Road, enabling a more convenient manoeuvre out of Angel Road for general traffic and cyclists. A similar double zebra crossing junction layout is found on Unthank Road at its junction with Park Lane and Essex Street, which has proven to be a very successful arrangement in slowing vehicles down and allowing cyclists to stay safely on the road.
22. Two local councillors made reference to the fact that when the crossing was first introduced on Waterloo Road it was a zebra crossing, and as a result of a petition from local residents it was converted to a signalled crossing in the 1990's. Since that time, the environment in the area has changed significantly, particularly following the implementation of the St Augustine's gyratory system. Prior to that, there were often long queues on Waterloo Road with traffic queuing back over the then zebra crossing, which resulted in pedestrians wanting to use the crossing being hidden by the stationary vehicles. It was for this reason the decision was taken to convert the

crossing to a signalled one. Nowadays, such queuing is rare and that justification for a signalled crossing no longer exists.

23. Department for Transport advice is that zebra crossings are a suitable crossing provision on roads with moderate traffic flows and 85th percentile speeds under 35mph. Waterloo Road is a 20mph area, with proposals for additional traffic calming measures. Traffic flows are under 10,000 a day which is considered to be moderate. Therefore it is considered that taking everything into account, zebra crossings are appropriate in this location.

Removal of the splitter island on Angel Road at the junction

24. The removal of the splitter island on Angel Road is necessary to allow traffic movement around the kerb build out. The kerb built out gives a traffic calming effect and the extra space on the footpath is needed to position the zebra crossing where people wish to cross. Without the kerb buildout the crossing would have to be moved further south where it interferes with accesses.

25. Although the splitter island is equipped with dropped kerbs, it is a very substandard provision as it is just 1.1m wide. This is well below the 1.8m minimum width that would be required under current regulations. It offers little protection to those pedestrians pushing buggies or in wheelchairs.

26. The current junction layout allows vehicles to accelerate around the corner and increases speeds on Angel Road. The Norwich Cycling Campaign has also reported that cyclists get squeezed on Angel Road by drivers trying to accelerate past them at the end of the splitter island by Patterson Road. While it is acknowledged that having a zebra crossing on a raised table will decrease the amount of acceleration into Angel Road, without the tightening of the radius on the corner there is still the opportunity for drivers to speed up once they have negotiated the zebra crossing, and this would not remove the problem reported by the Norwich Cycling Campaign.

27. Currently, the mouth of Angel Road on the pedestrian desire line for those walking along Waterloo Road is 15m wide, and three lanes of traffic need to be crossed, one into Angel Road and 2 out of it. The realignment of the junction reduces this to 10m and 2 traffic lanes.

Angel Road / Elm Grove Lane junction

28. The raised table proposed for the junction of Angel Road with Elm Grove Road is a standard form of traffic calming used in many areas of the city, but is relatively expensive due to the need to relay the kerb lines to provide adequate levels on the footways and drainage. Concerns on the cost of this and the concern from the NNAB that a substantial kerb edge is needed to help VIPs navigate the footpath edge, warrants consideration of a simpler solution.

29. The nearest traffic cushions on Catton Grove Road and Angel Road need to be removed as they are not easy for cyclists to navigate. It is proposed to replace these with full width sinusoidal humps which will help slow vehicles approaching the crossroads. Cllr Morphew has requested extra traffic calming in Catton Grove Road to slow traffic down. The existing traffic calming further north on Catton Grove Road was recently installed and this area is out of the scope of this scheme.

Limited waiting parking bay on Waterloo Road

30. The objection to the 30 minutes limited waiting on Waterloo Road outside house nos. 126/128 has to be balanced with the benefit this will give to surrounding retail businesses and the traffic calming effect of slowing vehicles down. The width of the carriageway at this location is sufficient for parked vehicles not to cause congestion. Reducing the time limit from 30 minutes to 15 minutes will have little impact and will inconvenience those drivers with reduced mobility who take longer to run errands.

Improvements to Shipstone Road cycle track

31. Consultation on the proposed improvements to Shipstone Road cycle track was carried out with the first consultation. In this consultation two residents expressed their concerns for the drainage on Shipstone Road and the removal of the existing cobbled areas as it was felt they help prevent cyclists from riding too close to their property.
32. It is felt that the cost of the proposed improvements to this cycle link outweigh the benefit to cyclists. In effect this is an aesthetic improvement that does have some benefit to the environment, but at this time of reduced budgets it would be appropriate not to go ahead with the proposed changes.
33. A further meeting with representatives of Norwich cycling campaign was held to discuss the approach in this report. It was understood the need to provide cost effective changes and suggestions were made to improve the existing cycle link on Shipstone Road. These included improvements to the ramp effect on both ends of the link, a smooth surface and removal or change to the existing bollards which cause obstruction to cyclists. These will be incorporated into the detail design.

Proposed double yellow lines on Angel Road opposite Rosebery Road

34. Consultation on the proposed double yellow lines on Angel Road opposite Rosebery Road junction was included in the first consultation. No objections for these double yellow lines were received.

Conclusion

35. The option of two zebra crossings on raised tables on Waterloo Road at its junction with Angel Road is suggested as being the best solution for this junction for both cyclists and pedestrians. However, with the existing signal crossing in good working order and not being at the end of its working life, it is recommended to leave it in place and not to make amendments to the layout of the Angel Road / Waterloo Road junction at this current time. It is anticipated that once the crossing reaches the end of its working life in around 6-8 years time, that would be the opportunity to make the changes proposed in the recent consultation.
36. In order to improve conditions for cyclists in the intervening period, it is suggested that additional traffic calming be introduced in Waterloo Road. In addition, it is proposed that the cycle lane, 30 minutes waiting area (on Waterloo Road), traffic calming modifications and double yellow lines (on Angel Road) and replacement of the southernmost speed cushions on Catton Grove Road with a sinusoidal hump as shown on plan nos. PE4122-CO-012 to 016 attached as appendix 5 to 9 are implemented as advertised.

37. This approach will require a new road hump notice to be advertised for the additional traffic calming in Waterloo Road. It is suggested consideration of any comments received from this consultation is delegated to the head of city development services, in partnership with the chair and vice chair of this committee.

Integrated impact assessment



NORWICH
City Council

Report author to complete

Committee:	Norwich Highways Agency Committee
Committee date:	18 January 2018
Director / Head of service	Andy Watt
Report subject:	Transport for Norwich – Angel Road / Waterloo Road cycling improvements
Date assessed:	12 December 2017
Description:	To consider responses from the first and second consultation and approve further advertising and consultation on the fourth option for Angel Road / Waterloo Road cycling improvements scheme.

	Impact			
Economic (please add an 'x' as appropriate)	Neutral	Positive	Negative	Comments
Finance (value for money)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other departments and services e.g. office facilities, customer contact	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ICT services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Economic development	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	This scheme helps to encourage sustainable travel to benefit the city and everyone who lives and works here.
Financial inclusion	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	This scheme promotes cycling and walking which are inclusive and low cost forms of transport.
Social (please add an 'x' as appropriate)	Neutral	Positive	Negative	Comments
Safeguarding children and adults	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	This scheme promotes road safety for all road users.
<u>S17 crime and disorder act 1998</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Human Rights Act 1998	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Health and well being	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The proposed facilities will help to encourage more walking and cycling which has been shown to benefit health. If more drivers are encouraged to walk or cycle, air pollution will decrease.

	Impact			
Equality and diversity (please add an 'x' as appropriate)	Neutral	Positive	Negative	Comments
Relations between groups (cohesion)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Eliminating discrimination & harassment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Advancing equality of opportunity	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This scheme aims to improve travel facilities for pedestrians and cyclists, making the roads safer for all road users.
Environmental (please add an 'x' as appropriate)	Neutral	Positive	Negative	Comments
Transportation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	This scheme helps to meet the corporate priority of a safe, clean and low carbon city
Natural and built environment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	This scheme will not have any adverse effects on the environment, but by encouraging non motorised travel will help improve air quality.
Waste minimisation & resource use	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If the decision is taken to retain the signalled crossing until the end of its working life is chosen, the existing signal control crossing will have a full period of service, giving a good cost benefit outcome.
Pollution	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	This scheme will help improve air quality by encouraging non motorised forms of travel and reducing traffic speeds.
Sustainable procurement	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Impact			
Energy and climate change	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The scheme contributes to the corporate priority 'a safe, clean and low carbon city' by encouraging cycle use, reducing car use and CO2 emissions
(Please add an 'x' as appropriate)	Neutral	Positive	Negative	Comments
Risk management	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The scheme is safety audited to ensure that the measures implemented create a safe environment.

Recommendations from impact assessment

Positive

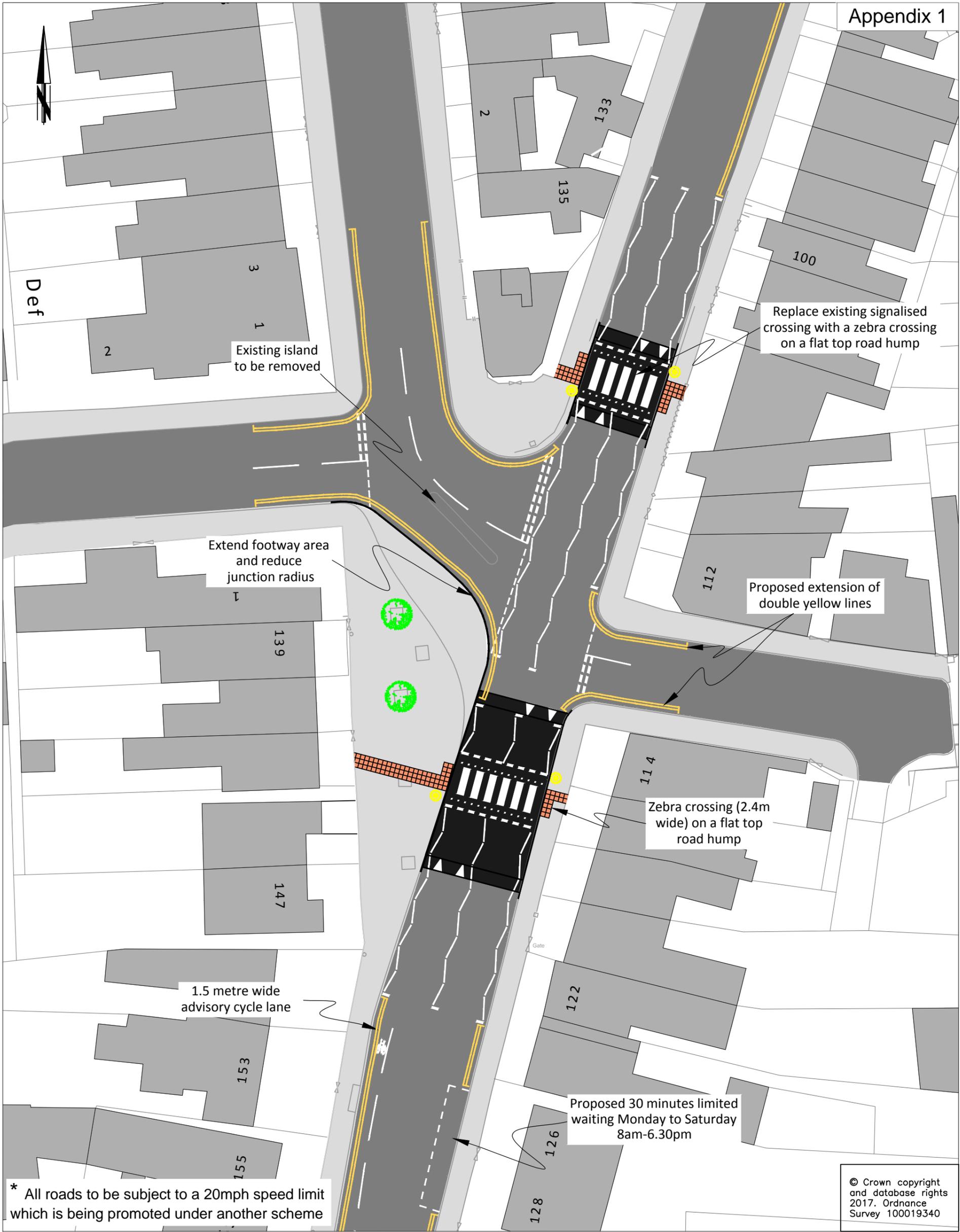
If option 4 is agreed, the signalised crossing will remain for some years to assist vulnerable people to adjust gradually to the changing environment in the proposed traffic calmed 20mph area.

Negative

With option 4, the signalised crossing will continue to give a delayed response to the pedestrian which may encourage misuse or avoidance of use which could become a safety issue.

Neutral

Issues



* All roads to be subject to a 20mph speed limit which is being promoted under another scheme

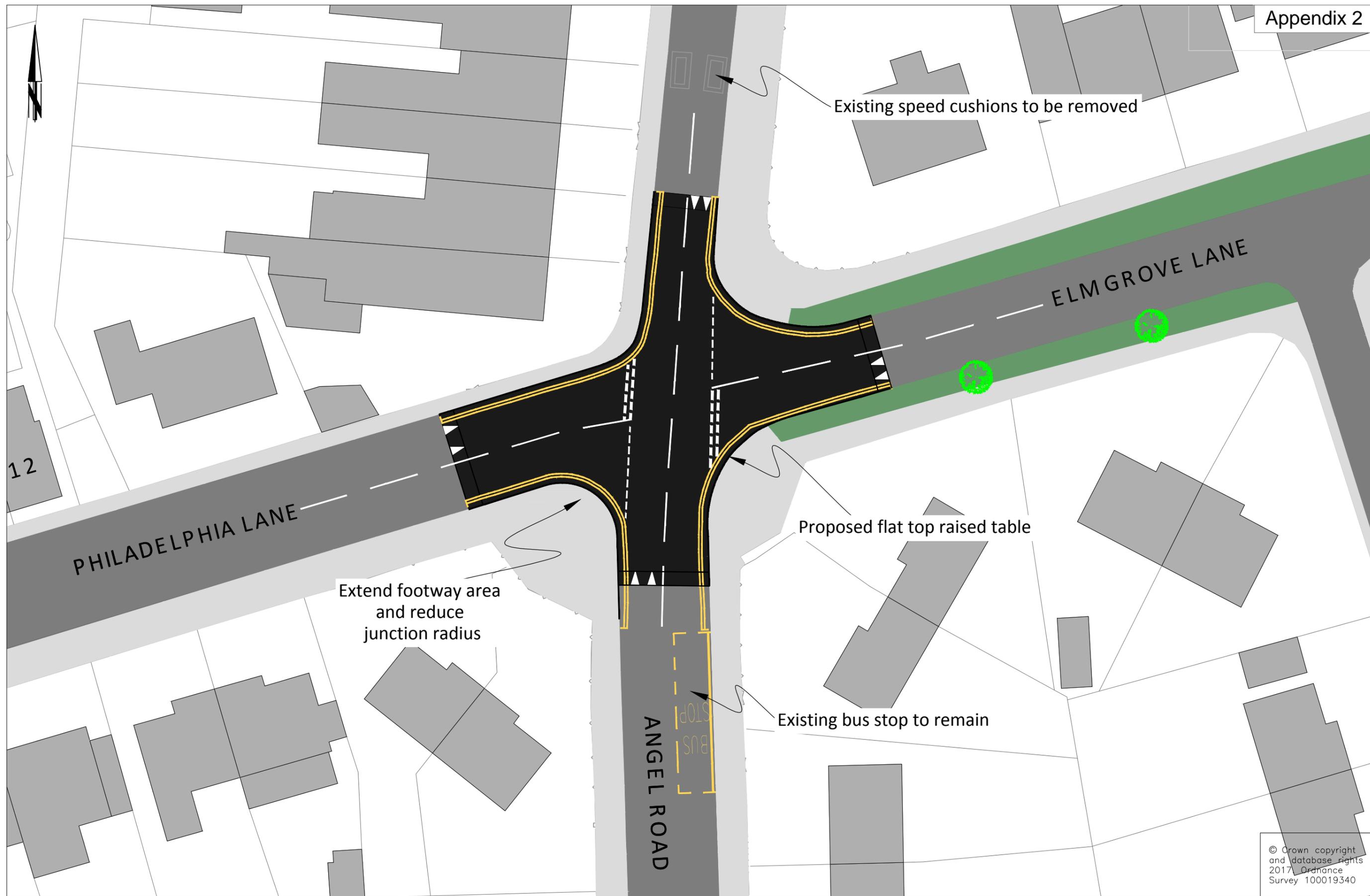
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<p>Funded by:</p>	<p>DRAWING TITLE</p> <p>TRANSPORT FOR NORWICH ANGEL ROAD/WATERLOO ROAD CONSULTATION PLAN</p>
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Tom McCabe
Executive Director of
Community and Environmental Services
Norfolk County Council
County Hall
Martineau Lane
Norwich NR1 2SG

REV.	DESCRIPTION	DRAWN	CHECKED	DATE

SURVEYED BY	INITIAL	DATE	DRAWING No.
OS	OS	07/17	PE4122-MP-010
JT	JT	07/17	PROJECT TITLE
JT	JT	07/17	Transport For Norwich
MA	MA	07/17	Angel Road/Waterloo Road
			SCALE
			FILE No.
			NTS
			PE4122



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DRAWING TITLE
TRANSPORT FOR NORWICH
ANGEL ROAD/ELM GROVE ROAD JUNCTION
RAISED TABLE

REV.	DESCRIPTION	CHECKED	DATE

	INITIALS	DATE	DRAWING No.
SURVEYED BY	OS	07/17	PE4122-MP-011
DESIGNED BY	JT	07/17	PROJECT TITLE
DRAWN BY	JT	07/17	Transport For Norwich Angel Road/Waterloo Road
CHECKED BY	MA	07/17	SCALE
			NTS
			FILE No.
			PE4122

Responses to the second consultation on Waterloo Road / Angel Road scheme (28/07/17 to 22/08/17)

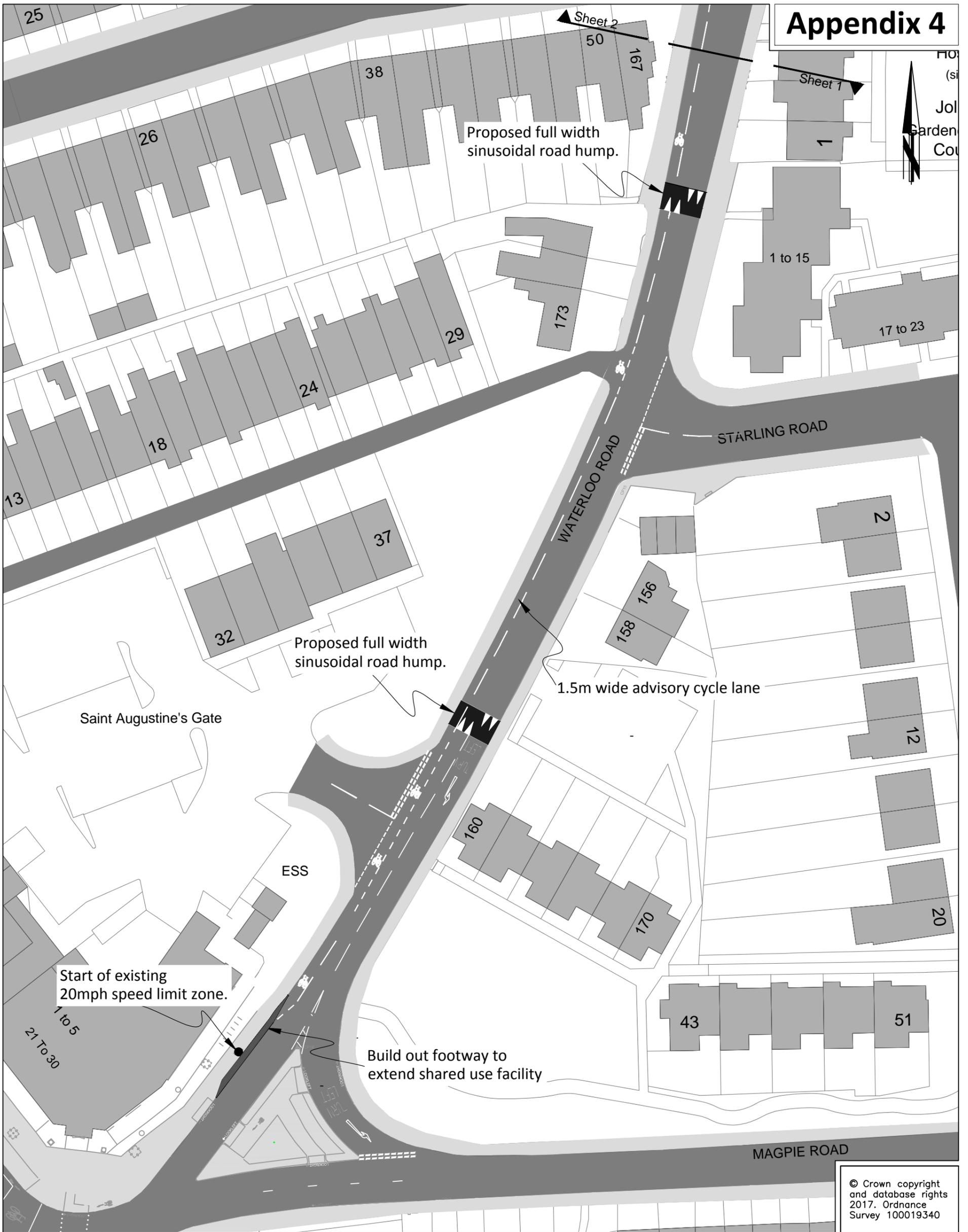
Responder	Object	Comments	Officer comments
Resident		Concerned with previously advertised design for Shipstone Road and how it will affect their property.	Shipstone Road is not under consultation this time. The design engineer will meet the resident to discuss the design.
Resident		"Totally in support of these proposed changes."	Support welcomed
Resident	Yes	I do not agree with the traffic calming on the Angel Road / Elm Grove Lane junction. I do not think there has been a bad accident at this location. Money would be better spent elsewhere.	Traffic calming at this junction is justified. The raised table was chosen as it provides a smoother travel for cyclists and buses and does not interfere with the bus stop on Angel Road
Resident		The proposed raised table at the zebra outside Nos 114 to 120 Waterloo Road would be a source of increased road noise into our house. Speed cameras would be a better solution to lower the speed of traffic. Please add double yellow lines to protect our entrance on Shipstone Road as the proposed yellow lines at the junction will push parked cars further down to block our entrance and the cycle track. I agree to both zebra crossings, the 30minutes waiting bay and the kerb realignment at the junction.	Raised tables have been used in many areas in the city, this should not increase road noise but lower traffic speed which will help the noise levels. Speed cameras are only used in areas of proven road safety issues. Double yellow lines are not provided to protect individual accesses; existing yellow lines protect the cycle lane. Support for parts of the scheme welcomed.

Responder	Object	Comments	Officer comments
Resident	Yes	The signalised crossing is safer for pedestrians and helps traffic at this junction. Road humps should not be installed as the government are concerned on their connection with air quality. Money will be wasted when they have to be removed.	Please see report for replies. There has been no official response from the government on concerns about road humps. Until such time, working as agents for Highways England we must follow current guidelines.
Resident		Gives support for the scheme.	Support welcome.
Resident		Requested confirmation about proposals	Information given.
Cllr Julie Brociek-Coulton	Yes	A signalised crossing is needed on Waterloo Road it is the safest way to cross. The pedestrian refuge on Angel Road at the junction is needed, especially for school children who use it to cross. The parking bay outside the shop on Waterloo Road is not a good idea as it stops the flow of traffic; maybe it should be for 15 minutes stay. I agree with the speed humps, but the signalised crossing is needed and helps traffic to emerge from Angel Road. Please consider the petition from the previous consultation.	Please see report

Responder	Object	Comments	Officer comments
Cllr Steve Morpew	Yes	The removal of the traffic island on Angel Road will reduce traffic discipline and make crossing more hazardous. The signalised crossing helps traffic flow at the junction because of the certainty of the lights, a zebra will not. As the signals are not at the end of their life, they should remain. The raised table at the Angel Road / Elm rove Lane junction is over engineered and would be better with a mini roundabout. Other problems with the existing traffic calming in the surrounding areas need solutions.	Please see report
First Bus		Any speed humps or raised tables should be 65mm high as this allows a smooth passage for buses. The kerb alignment at the junction may make it hard for buses to manoeuvre; we need to maintain a balance between road safety and vehicle speeds.	In the past 65mm high humps have been used on the highway on a bus route, but it has been found these have a minimal effect on traffic speeds, especially if the road is "surface dressed" for maintenance reasons. Engineers have tracked the new design to ensure buses and other large vehicles can manoeuvre round this junction.
Norfolk and Norwich Association for the Blind	Yes	The NNAB would like to see a signal controlled crossing retained. These are vital for visually impaired people allowing them to cross roads confidently when they are unable to use the visual clues available to the wider population.	Please see report.

Responder	Object	Comments	Officer comments
Norfolk Constabulary		Norfolk Constabulary supports the proposal which will give pedestrians safer places for pedestrians to cross and help regulate traffic speed. Please consider enforcing the Catton Grove Road bus gate with camera technology.	Support welcome, camera enforcement will be considered.
Norfolk Living Streets		We have concerns to the removal of the pedestrian island on Angel Road at the junction as this is very busy. The two proposed zebra crossings are welcomed. The raised table on Angel Road / Elm Grove Lane and removal of speed cushions are welcomed.	Support welcomed. The traffic island is discussed in the report.
Norwich Cycling Campaign		We prefer the option of two zebras on raised tables as this will create greater calming across the whole junction benefitting cyclists and pedestrians. The footpath is not wide enough for a shared footway / cycleway if a toucan is provided. We welcome the extension of the 20mph area and the removal of speed cushions and replacement with sinusoidal humps. The cycle lane on Waterloo Road will be of little help as this will encourage cyclists to ride next to the kerb and vehicles will move too close. Please consider painting a "cycle path" across the junction from Shipstone Road to Angel Road to raise awareness of cyclists. The Catton Grove Road bus gate must be enforced.	Support welcome. As discussed in the previous report the advisory cycle lane is to enhance drivers' awareness of cyclists on this road. The lane will be 1.5m wide and will leave enough room on road for most vehicles to pass without moving into the cycle lane. The suggestion of cycle lane across the junction will be discussed with the design team. Norfolk Constabulary have been requested to enforce the bus gate, they have asked us to consider camera enforcement too.

Appendix 4



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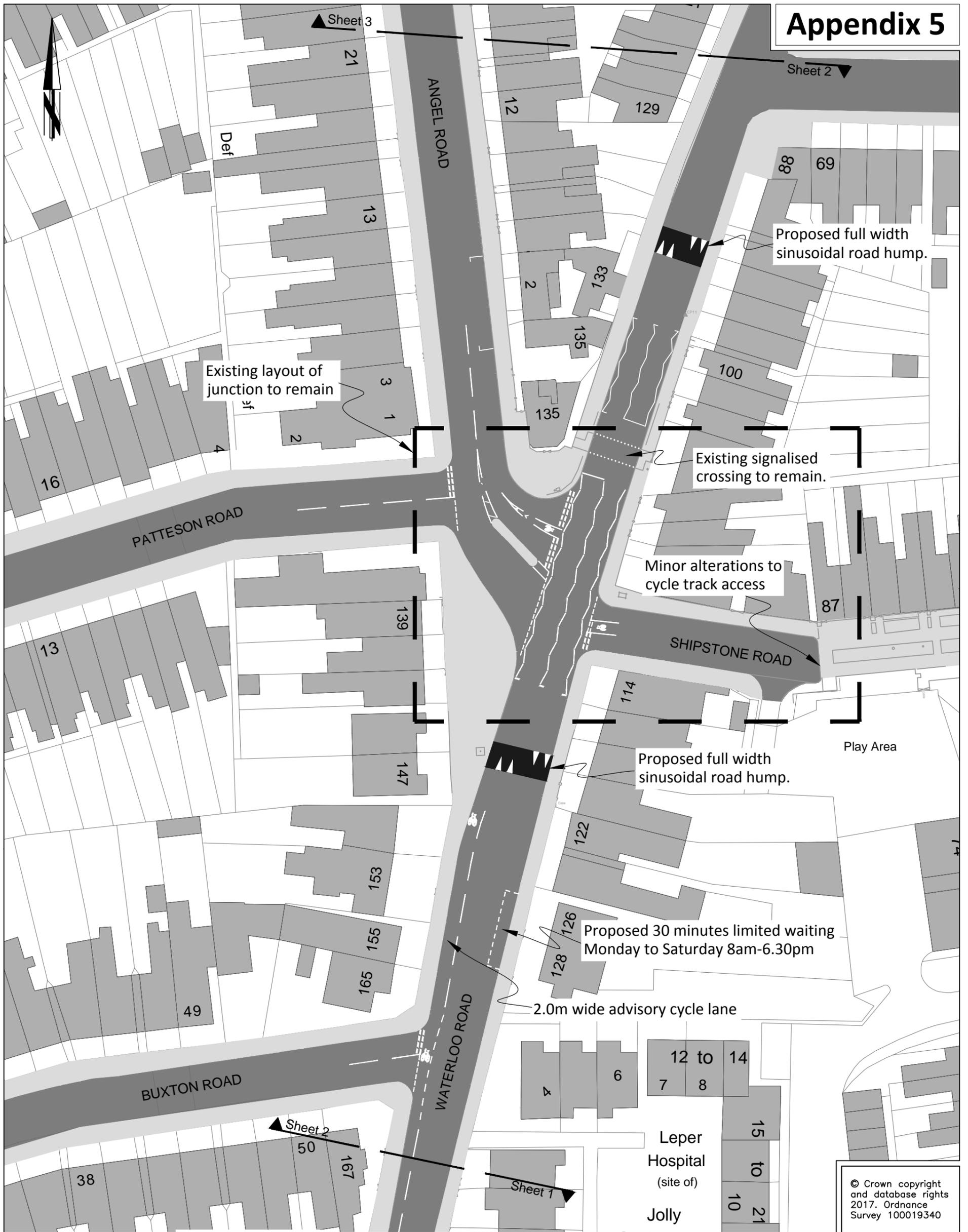
Transport for Norwich
PE4122 Angel Road/Waterloo Road
Sheet 1

Tom McCabe
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Norfolk County Council
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Martineau Lane
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REV.	DESCRIPTION	DRAWN	CHECKED	DATE

SURVEYED BY	INITIAL	DATE	DRAWING No.
OS	OS	2016	PE4122-CO-012
DESIGNED BY	JT	10/17	PROJECT TITLE
DRAWN BY	JT	10/17	Transport for Norwich
CHECKED BY	BL	10/17	Angel Road/Waterloo Road
			SCALE
			FILE No.
			PE4122

Appendix 5



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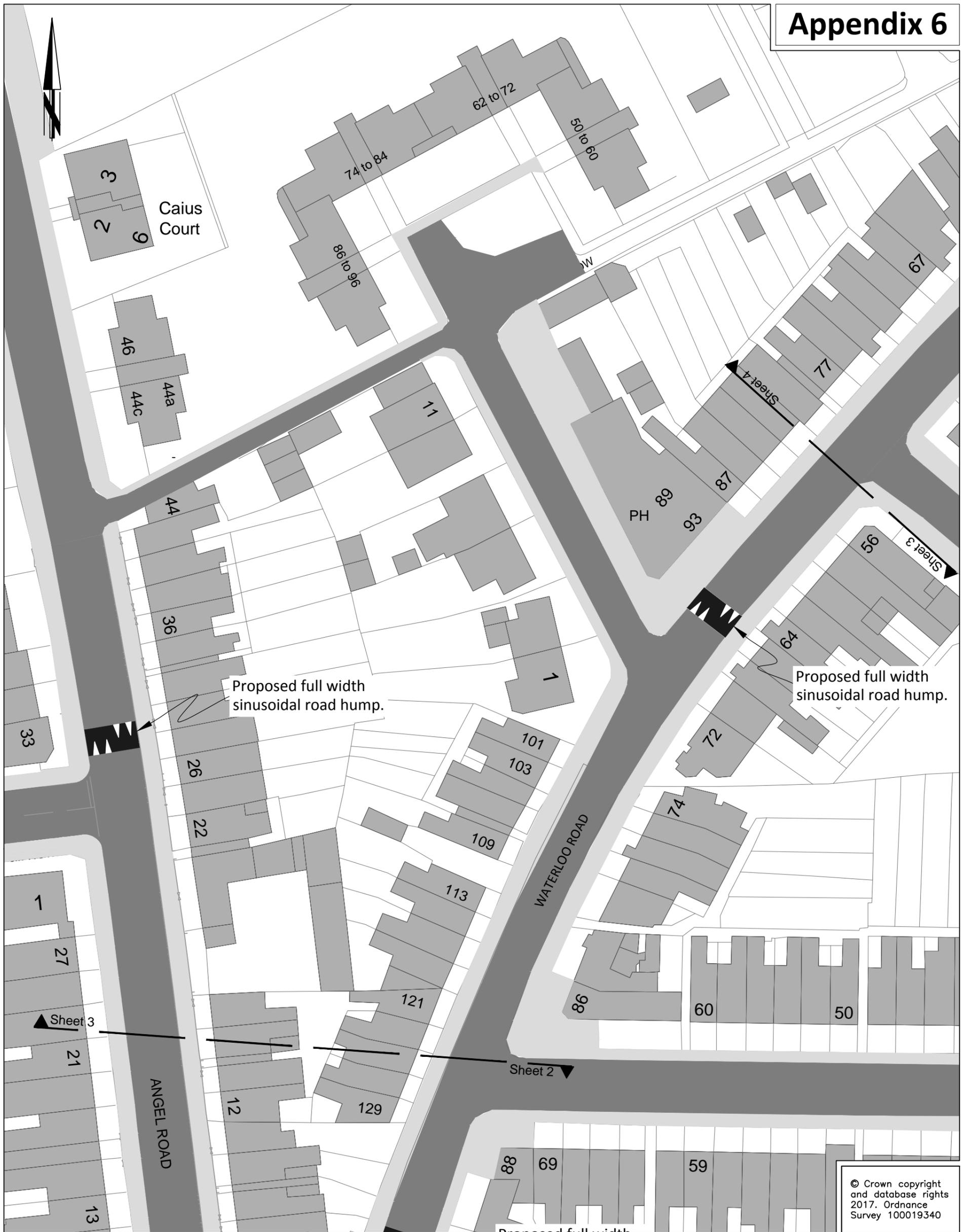
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DRAWING TITLE: Transport for Norwich PE4122 Angel Road/Waterloo Road Sheet 2

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Norwich NR1 2SG

REV.	DESCRIPTION	DRAWN	CHECKED	DATE

	INITIAL	DATE	DRAWING No.
SURVEYED BY	OS	2016	PE4122-CO-013
DESIGNED BY	JT	10/17	PROJECT TITLE
DRAWN BY	JT	10/17	Transport for Norwich
CHECKED BY	BL	10/17	Angel Road/Waterloo Road
			SCALE FILE No.
			NTS PE4122



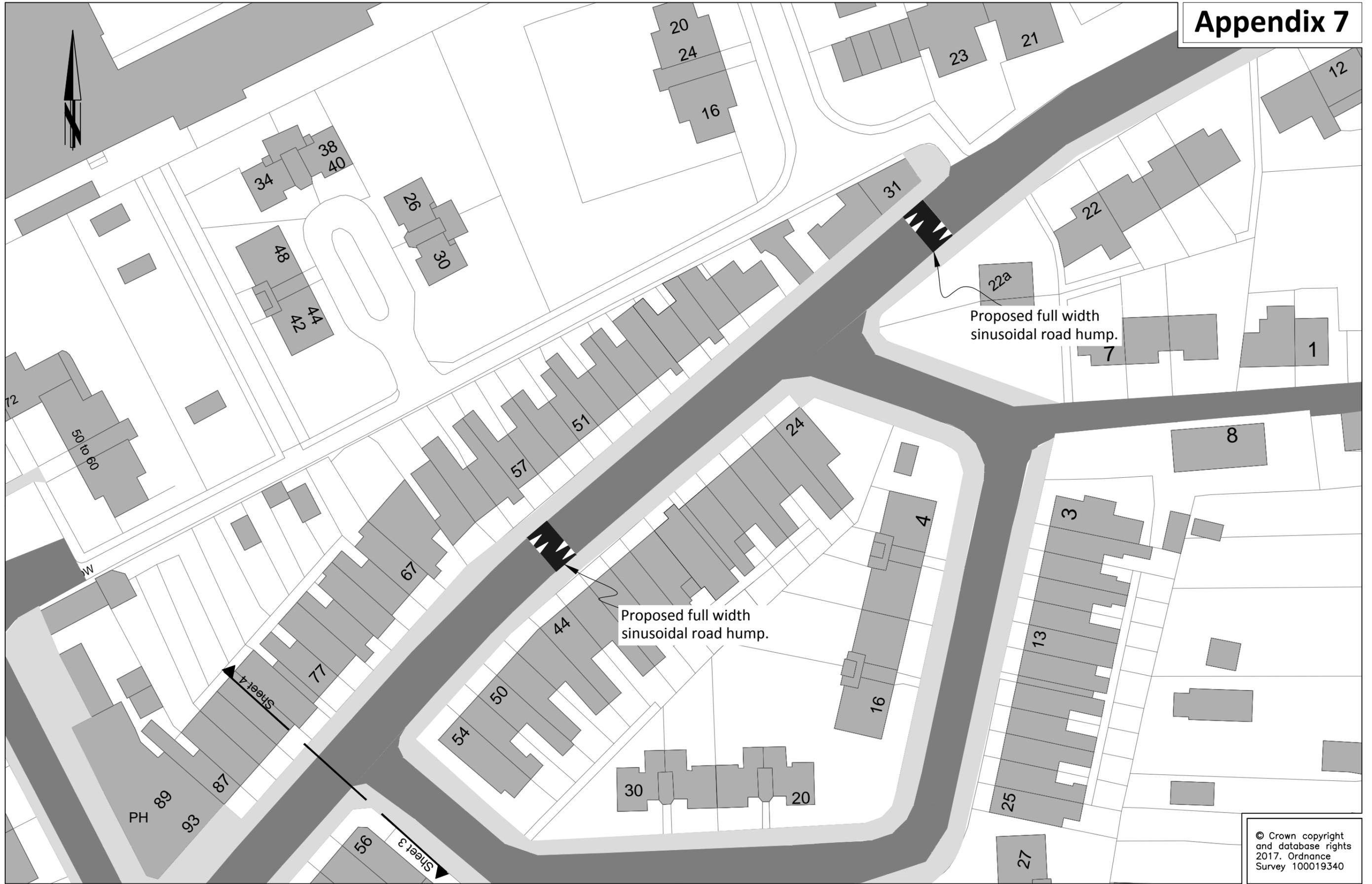
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<p>Funded by:</p>	<p>DRAWING TITLE</p> <p>Transport for Norwich PE4122 Angel Road/Waterloo Road Sheet 3</p>
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REV.	DESCRIPTION	DRAWN	CHECKED	DATE

SURVEYED BY	INITIAL	DATE	DRAWING No.
OS	OS	2016	PE4122-CO-014
JT	JT	10/17	PROJECT TITLE Transport for Norwich Angel Road/Waterloo Road
JT	JT	10/17	
BL	BL	10/17	SCALE NTS
			FILE No. PE4122



Proposed full width sinusoidal road hump.

Proposed full width sinusoidal road hump.

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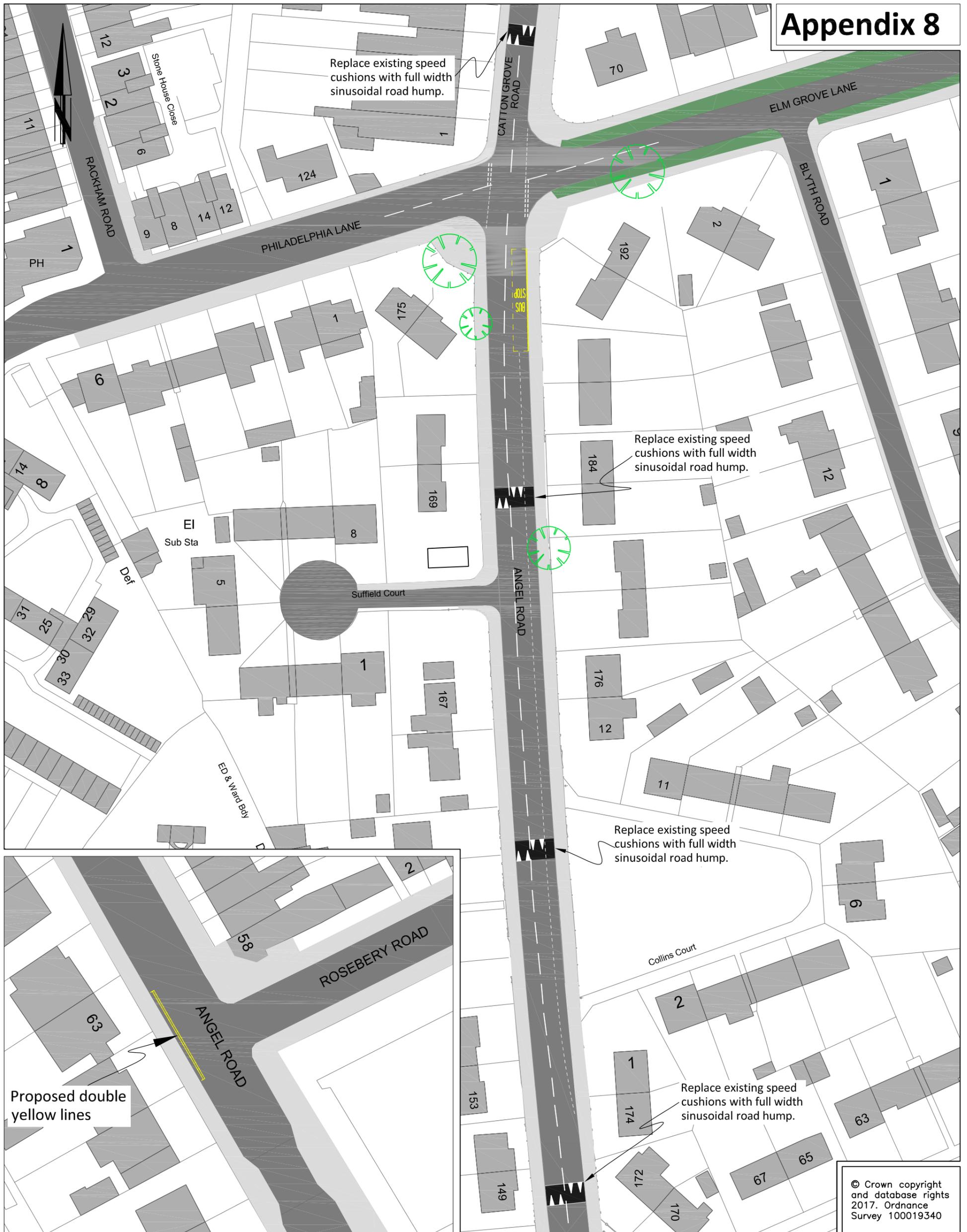
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Tom McCabe
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Community and Environmental Services
Norfolk County Council
County Hall, Martineau Lane
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DRAWING TITLE
Transport for Norwich
PE4122 Angel Road/Waterloo Road
Sheet 4

REV.	DESCRIPTION	DRAWN BY	CHECKED	DATE

SURVEYED BY	INITIALS	DATE	DRAWING No.
OS	OS	2016	PE4122-CO-015
DESIGNED BY	JT	01/17	PROJECT TITLE
DRAWN BY	JT	01/17	Transport for Norwich
CHECKED BY	BL	01/17	Angel Road/Waterloo Road
			SCALE
			NTS
			FILE No.
			PE4122



Funded by:



Department for Transport

NEWANGLIA
Local Enterprise Partnership for Norfolk and Suffolk

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Transport for Norwich
PE4122 Angel Road/Waterloo Road
Sheet 5

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Executive Director of
Community and Environmental Services
Norfolk County Council
County Hall
Martineau Lane
Norwich NR1 2SG

REV.	DESCRIPTION	DRAWN	CHECKED	DATE

INITIAL	DATE	DRAWING No.
SURVEYED BY OS	2016	PE4122-CO-016
DESIGNED BY JT	10/17	PROJECT TITLE
DRAWN BY JT	10/17	Transport for Norwich
CHECKED BY BL	10/17	Angel Road/Waterloo Road
		SCALE FILE No.
		NTS PE4122