Chilton Road: Improving conditions for walking and cycling

May 2020

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Contents

1. Introduction

This report makes the case to improve walking and cycling conditions on Chilton Road, Upton, Oxfordshire by reducing traffic speeds and flows.

It starts by presenting context and background information about Chilton Road, before presenting analysis of traffic data. It then presents the case for reducing traffic on Chilton Road and then the case for improving walking and cycling conditions.

The report then summarises three design options considered by Oxfordshire County Council (OCC) to improve walking and cycling conditions, before presenting the preferred option in more detail.

2. Context and background

Chilton Road is an important link in the local walking and cycling network

Chilton Road is a country lane near Upton, south of Didcot, Oxfordshire. National Cycle Network (NCN) Route 544 uses it to connect Didcot (5km north) to Harwell Campus (3km west) and beyond to Wantage (9km west of Harwell Campus). Route 544 either side of Chilton Road offers people a safe, pleasant, direct and traffic-free walking or cycling experience.

Route 544 follows a former railway line between Didcot and Upton

Route 544 uses farm tracks west of Chilton Road to Harwell Campus

However, Chilton Road itself is busy with rat-running traffic travelling at speed and there is no provision for safe walking and cycling along this 1km stretch of road. It is the poorest section of Route 544, suppressing usage and the potential for more people to walk and cycle for everyday and leisure trips.

NCN audit results showing Chilton Road as 'very poor'

Sustrans conducted a comprehensive review of the entire National Cycle Network, which resulted in our Paths for Everyone report in 2018[1]. The screenshot above comes from this report, which identified Chilton Road as a 'very poor' section of the NCN because of the high traffic speeds and flows. The traffic-free sections either side were rated as 'good'.

Sustrans identified Chilton Road as a priority section of NCN in need of improvement – an 'activation project'[2] – for which Department for Transport (DfT) funding was secured in April 2019. The purpose of this funding is to reduce traffic speeds and flows on Chilton Road and improve the safety of the junctions at each end (i.e. at London Road and Hagbourne Hill).

[1] Paths for Everyone report: www.sustrans.org.uk/about-us/paths-for-everyone/
[2] Paths for Everyone: England South Action Plan: (https://www.sustrans.org.uk/media/3718/3718.pdf)

New slip roads were added to the A34 a few years ago. At this time, there were proposals to close Chilton Road to through traffic. Eventually a compromise was reached to keep the road open to traffic, but provide a priority give way chicane where the homes begin on Chilton Road in an effort to slow downhill traffic. Experience from site visits and users of the road indicate that the chicane does not have much of an impact of vehicles speeds or driver behaviour – with many drivers not respecting the priority of uphill traffic. Moreover, the chicane does little to provide a safe environment for walking and cycling along the length of Chilton Road.

Current priority give way chicane on Chilton Road

3. Traffic analysis

Traffic speeds and flows are high for a country lane

Two-way vehicle flows on Chilton Road total approximately 3,000 on a weekday. The most recent data captured – across a week in January 2020 – shows that between 7am-7pm, the average weekday total is 3,085. The table below shows how this has increased over recent years; note the increase in traffic after the A34 slip roads were constructed between 2014 and 2017. This increase in traffic has also been reported anecdotally by local residents and stakeholders.

Date	Two-way total (7am-7pm, weekday)
April 2014	2,363
July 2017	3,028
January 2020	3,085

From the January 2020 data, 89% of traffic is cars, with 8% being two-axle large vehicles (e.g. Luton vans) and 1% pedal cycles.

Traffic speeds were also analysed in January 2020. The speed limit on Chilton Road is 40 mph. The 85% speed was reported as 42.9mph, the mean speed 37.5mph, with 30% of vehicles recorded exceeding the speed limit. This shows relatively poor compliance with the current speed limit.

Current cycling flows are low on the road, despite it being signed as the NCN. January 2020 data showed a weekday average of 32 cyclists, with 20 for weekend days (indicating that many current cyclists are commuters). However, January is not the most inviting of times to cycle. Data from a route user intercept survey conducted in September 2019 showed an average of 77 cyclists per weekday. Cycling flows are low due to the high traffic speeds and flows. Anecdotally, local residents say that cyclists have declined over recent years in response to increasing traffic volumes.

Design guidance

Highways England publishes guidance on how to provide for cycles depending on the speed and flow of traffic[3] from which the table below comes. It recommends that for 40mph roads, cycles should be separated from general traffic by a cycle track.

Table E/1.1 Minimum provision for cycle routes

Speed limit (mph)	Motor traffic flow (AADT-Average annual daily traffic)	Minimum provision for cycle routes
40 and over	All flows	Cycle tracks (excluding stepped cycle tracks)
30	>5,000	Cycle tracks
	0-5,000	Cycle lanes
20	>5000	Cycle tracks
	2,500-5,000	Cycle lanes
	<2500	Quiet streets

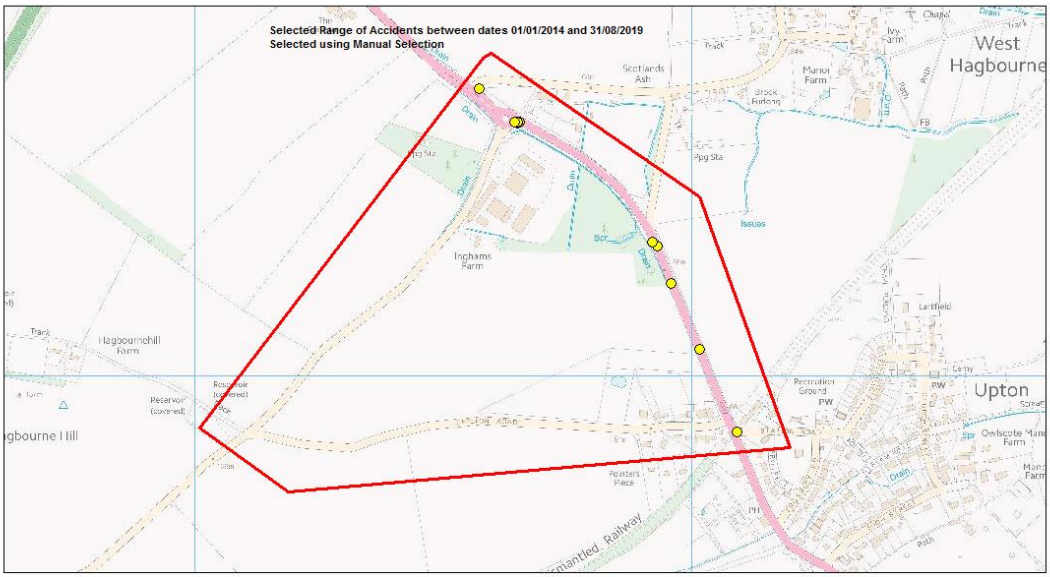
Sustrans' 'quiet-way' standard for on-road sections of the NCN, developed in the Paths for Everyone report[4] states that rural roads with a 40 mph speed limit are acceptable if daily traffic flow is less than 1,000. So the flows of over 3,000 are too high, in addition to the vehicles exceeding the speed limit.

In summary, the recorded traffic flows and speeds are too high for a safe cycling and walking route. Both must be reduced to improve conditions for people on foot and on cycles.

[3] CD 195 Designing for Cycle Traffic, Highways England
[4] p. 31, Paths for Everyone: www.sustrans.org.uk/about-us/paths-for-everyone/

Collisions

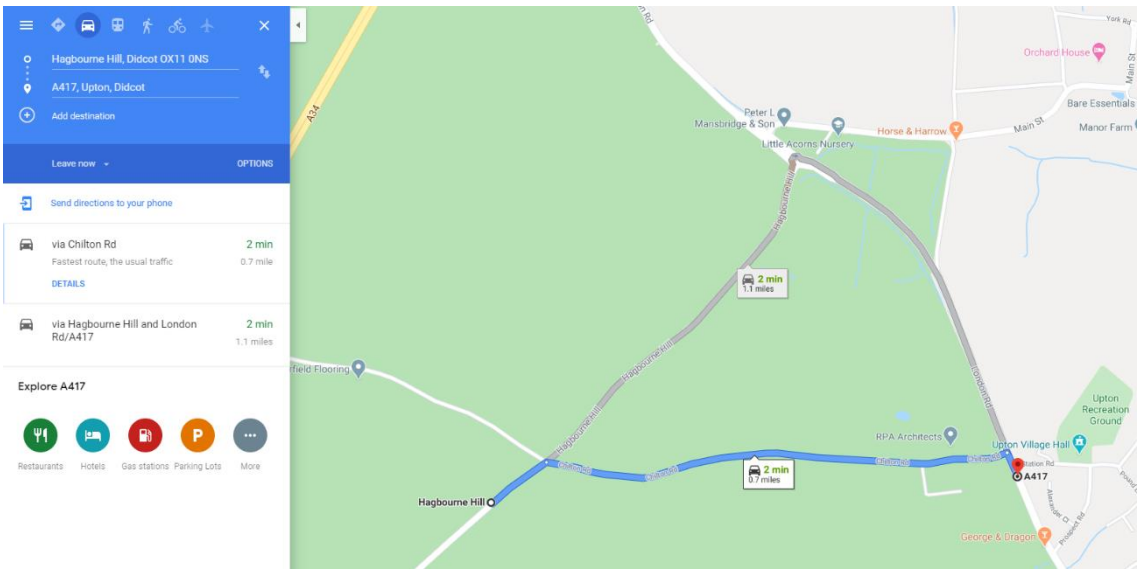
There were no recorded traffic collisions which resulted in slight, serious or fatal injury in a five year period (2014-2019) on Chilton Road. Oxfordshire County Council data recorded 10 collisions reported to the Police along London Road in the near vicinity to Chilton Road – all resulting in slight injury. Note that the three recorded at Hagbourne Hill junction all happened before it was upgraded to a roundabout. The map below, provided by OCC, shows the location of these collisions.



4. The case for reducing traffic on Chilton Road

If Chilton Road did not exist, there would be no case for building it

Chilton Road is not an essential link for vehicles in the local road network because there is a high capacity link which already provides vehicles with the same movement in a safer and equally quick way. Chilton Road is, however, a road which appears convenient to drivers when looking at a map. The screenshot below shows Google map driving directions from Upton to the crest of Hagbourne Hill.



Driving directions between Upton and Hagbourne Hill (Google maps, accessed April 2020)

It shows two options:

1 Take Chilton Road – 0.7 miles, 2 minutes driving time

2 Take London Road and Hagbourne Hill – 1.1 miles, 2 minutes driving time

While Chilton Road is shorter, it isn't any quicker for drivers. This is because London Road, Hagbourne Hill and their junctions are designed for higher speeds and smoother vehicle flows, with 60 and 50 mph speed limits respectively. Crucially, the junction between the two roads is a roundabout (upgraded recently), which enables more vehicles to flow through it more easily. The junctions at each end of Chilton Road give

way to the main roads, causing traffic to queue at busy times and inviting potentially dangerous behaviour from gap-seeking drivers when joining the main roads.

If Chilton Road did not exist, drivers would not notice the time penalty to their journey, as well as using roads that are better-engineered and therefore safer for vehicles at speed.

Moreover, research into traffic reduction schemes shows that concerns about traffic problems on surrounding roads are usually far less serious than predicted[5]. After an initial period of adjustment, a portion of traffic 'evaporates' through a variety of factors, such as re-routing, changing the time of journey or changing mode. The portion which evaporates varies based on local context; evidence from 70 international case studies (mostly urban but some rural) showed an average figure of 10-20% of the traffic that was previously using the closed road could not be found in the surrounding area afterwards[6].

[5] *Reclaiming city streets for people*. 2004. European Commission
[6] Cairns, Atkins and Goodwin, 2002, 'Disappearing traffic? The story so far.' *Municipal Engineer*, p.13-22

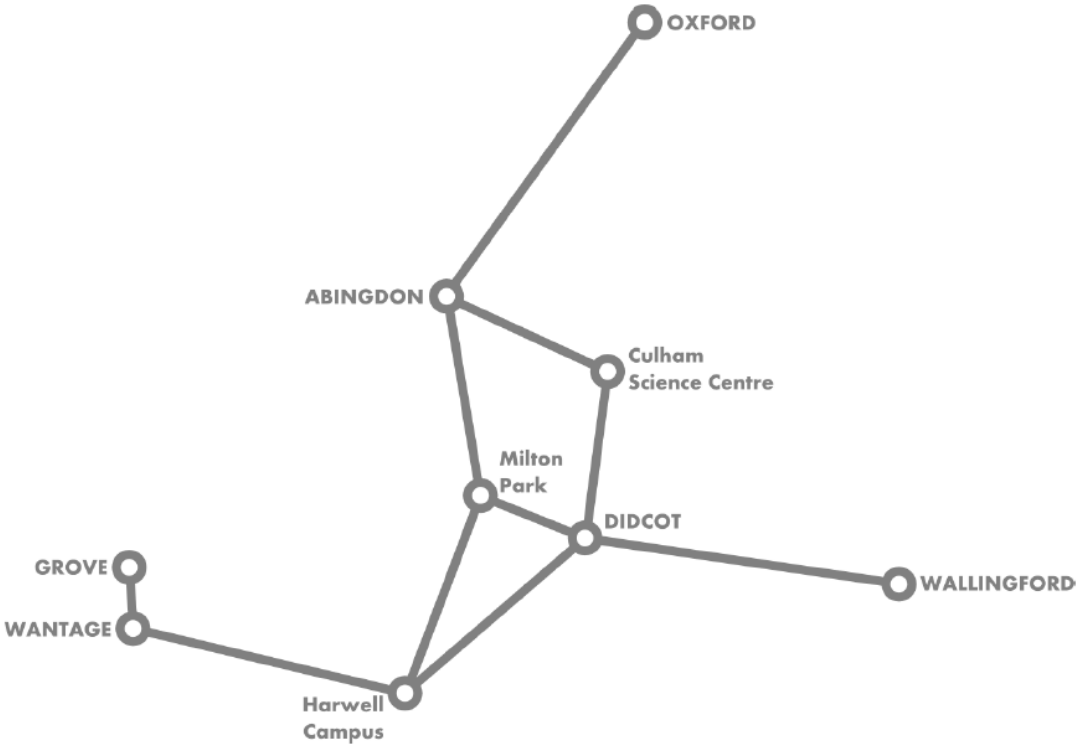
5. The case for improving walking and cycling conditions on Chilton Road

A strategic link between Harwell Campus and Didcot

Didcot to Harwell Campus is a key link to connect a local employment site with a sizable town and transport hub. Around 6,000 people work at Harwell Campus[7], nearly 27,000 people live in Didcot[8] and Didcot Parkway station has over 3m passengers per year[9].

Oxfordshire County Council recognise this important link for active travel. Their Local Transport Plan (2015-2031) includes a cycling strategy to improve connections in the Science Vale area of key employment sites, including Harwell Campus, Milton Park and Culham Science Centre[10]. The connection from Didcot to Harwell Campus is a key strategic link in this network, shown in the diagram below from the Science Vale Cycling Strategy.

7 https://www.harwellcampus.com/
8 Census 2011
9 Station Usage Estimates, Entries and Exits, 2018-19, Office of Rail and Road
10 Science Vale Cycling Strategy, Oxfordshire County Council



Science Vale strategic cycling connections

Comparison with a successful traffic-free route

Route users don't find Chilton Road safe to cycle or walk along

As previously described, current walking and cycling numbers are low on Chilton Road, with 70 cyclists and 30 pedestrians counted per weekday when surveyed in September 2019. That same survey – commissioned by Sustrans to provide baseline monitoring of this route – interviewed 54 current route users about their views on Route 544 on Chilton Road. Findings from these interviews illustrate some key issues:

- When asked if they would recommend this route to a friend, on a scale of 0 (very unlikely) to 10 (very likely), the two highest scoring categories were:
  - 37% responded 8 (likely)
  - 20% responded 0 (very unlikely)
- When asked if the route feels safe, opinion was split:
  - 43% strongly agreed or agreed
  - 43% strongly disagreed or disagreed
- Among cyclists, 92% described themselves as experienced, regular cyclists

Comparison with the same survey (run in September 2018) on the Bristol to Bath railway path[11] – an exemplary Sustrans traffic-free route – highlights how route users answer on a high quality walking and cycling route:

- Would they recommend this route to a friend?
  - 76% of respondents responded 10 (very likely to recommend to a friend)
  - No respondent replied with less than a 4 to this question
- Does the route feel safe?
  - 89% strongly agreed or agreed
  - 3% strongly disagreed or disagreed
- A greater proportion of cyclists – 29% – described themselves as new, returning or occasional cyclists, while 71% were experienced, regular cyclists.

[11] http://www.bristolbathrailwaypath.org.uk/home.shtml

Forecasting potential demand

Suppressed demand for 400 weekday and 160 weekend cycle trips

It is difficult to accurately forecast potential demand that is currently suppressed along this route as there are many factors involved, e.g. weather, linked trips, caring responsibilities, storage facilities for cycles at home or work.

One of the main sources of data for forecasting demand is the 2011 Census Journey to Work (JtW) data, which is the most recent available and doesn't take account of recent developments, e.g. A34 slip roads and expansion at Harwell Campus. Moreover, the JtW data is not granular enough to identify commuters between Didcot and Harwell – origin-destination data is published by quite large geographic areas (Middle Layer Super Output MSOA areas).

To develop a reasonable picture of potential demand should conditions on Chilton Road be significantly improved for walking and cycling, there are two sources to estimate commuting and leisure demand. First, potential demand from Harwell Campus employees as the principal employment destination served by NCN544; second, counted cyclists on a nearby traffic-free route – the Phoenix Trail – to benchmark potential leisure trips.

Harwell Campus conducted a travel survey of employees in 2018[12], which revealed:

- Didcot is the largest home postcode of Harwell Campus employees:
  - 23% Didcot
  - 15% Wantage
  - 15% Abingdon
  - 13% Oxford
- It takes 56% of respondents half an hour or less to currently get to work
- 2.5% cycle currently, 81% drive

[12] Kindly shared with us by Harwell Bicycle User Group

- 31% of respondents would consider cycling
- When asked what might encourage them to cycle to Campus:
    - More dedicated cycle paths to/from Campus
    - Safer, better lit cycle routes
    - Improved safety measures at road junctions

Assuming c.6,000 employees at Harwell Campus, of which 23% live in the Didcot area and 31% of whom would consider cycling. 6000 x 0.23 x 0.31 = 428 potential weekday cycling return commuting trips from Didcot to Harwell Campus.

The Phoenix Trail is a traffic-free greenway between Princes Risborough and Thame[13]. It is ideal for leisure trips, confirmed by count data which is higher on weekends. The average weekend day total for cyclists in 2017 was 165 and in 2018 150, although these figures have significant seasonality – as high as 270 in summer and as low as 40 in winter.

Thus it would be reasonable to forecast that weekday cycle trips could reach c.400 per day, made up of modal shift by Harwell Campus employees plus other journey purposes such as weekday leisure trips or shopping trips by local residents. While weekend cycle trips of c.160 also seems reasonable, with seasonal variation.

Local residents cannot currently cross London Road safely

Forecasting future use by pedestrians is harder still to estimate, and would depend on the type of infrastructure proposed on Chilton Road. Given Chilton Road's location, it is not realistic to predict many people walking to work using Route 544. However, an improved environment for walking and cycling could open this road to more local leisure trips for enjoyment, health and wellbeing.

At a more local level still, the provision of a formal pedestrian crossing of London Road from Chilton Road (where there is none currently) could have a big impact on the *quality* of provision for residents of Upton – and Chilton Road in particular – although it would not have a big impact on the *quantity* of trips on foot.

[13] https://www.sustrans.org.uk/find-a-route-on-the-national-cycle-network/phoenix-trail-princes-risborough-to-thame/

6. Design options

This report has so far set out the current conditions and the case for reducing traffic flows and speeds on Chilton Road to allow an improved environment for walking and cycling.

Sustrans developed three design options to improve walking and cycling conditions on Chilton Road for OCC to consider[14]. Following discussions with OCC Option 2: Full Closure was the preferred option on the basis that it provides the greatest positive impact for walking and cycling.

1 One-way general traffic with two-way cycle track

2 **Full closure – preferred option**

3 Two-way cycle street 'Quiet Lane'

This section summarises the two design options which were considered but not taken forward and presents the preferred option in more detail, including concept design drawings.

Junction details

The junctions of Chilton Road with London Road and with Hagbourne Hill are for the most part consistent across all three options. To avoid repetition, they are described once below.

Junction of Chilton Road / London Road / Station Road

A 3m wide shared use path is proposed at the north east corner of Station Road and London Road, leading to a proposed Toucan crossing of London Road. The proposed shared use path will continue on the south side of Chilton Road until users re-join the carriageway.

[14] The three design options underwent a Stage One Road Safety Audit (RSA), in accordance with General Principles and Scheme Governance General Information (GG 119). The road safety audit team were independent of the design team. The options presented in this report have been modified in light of the recommendations made in the Stage One RSA.

Hagbourne Hill and Chilton Road Junction

Junction narrowing and an uncontrolled crossing facility across Hagbourne Hill at the junction with Chilton Road. Rumble strips and cycle activated warning signs are proposed on the approach on Hagbourne Hill, which will encourage vehicles to slow as they approach the crossing.

Option 1: One-way general traffic with two-way cycle track

Option 1 proposes closing Chilton Road to eastbound vehicle traffic entering from Hagbourne Hill, to maintain one-way westbound vehicle flow and to add a two-way segregated cycle track on the northern side of the road. Two-way vehicle movement will be permitted for farm vehicle access and for residents of Chilton Road only.

Pull-out gaps are provided at regular intervals to allow westbound traffic to pass contraflow farm vehicles safely.

Option 3: Two-way cycle street 'Quiet Lane'

Option 3 proposes maintaining two-way vehicle traffic on Chilton Road, while adding frequent speed control measures to make Chilton Road into a Quiet Lane[15]. The speed limit must be reduced to 20 mph along the entire length of Chilton Road because legislation requires street lighting where speed humps are installed on a 30mph road[16].

A Dutch-style cycle street with advisory cycle lanes to narrow the effective carriageway is suggested to give cyclists priority as there is not enough road width to use segregated cycle tracks while maintaining two-way vehicle movement.

[15] The Quiet Lanes And Home Zones (England) Regulations 2006
http://www.legislation.gov.uk/uksi/2006/2082/pdfs/uksiem_20062082_en.pdf
[16] The Highways (Road Humps) Regulations 1999
http://www.legislation.gov.uk/uksi/1999/1025/pdfs/uksi_19991025_en.pdf

Preferred option: Full closure

The preferred option proposes a full closure of Chilton Road to through vehicle traffic in both directions. This will be achieved with an access control in the form of a chicane on Chilton Road installed 5m east of the Hagbourne Hill junction. Cycle movement is maintained in both directions, however cyclists will have to slow as they navigate the chicane near the junction. The chicane will be wide enough to accommodate non-standard cycles and wheelchairs. Only farm vehicles and residents will be permitted access to Chilton Road – access only to and from London Road.

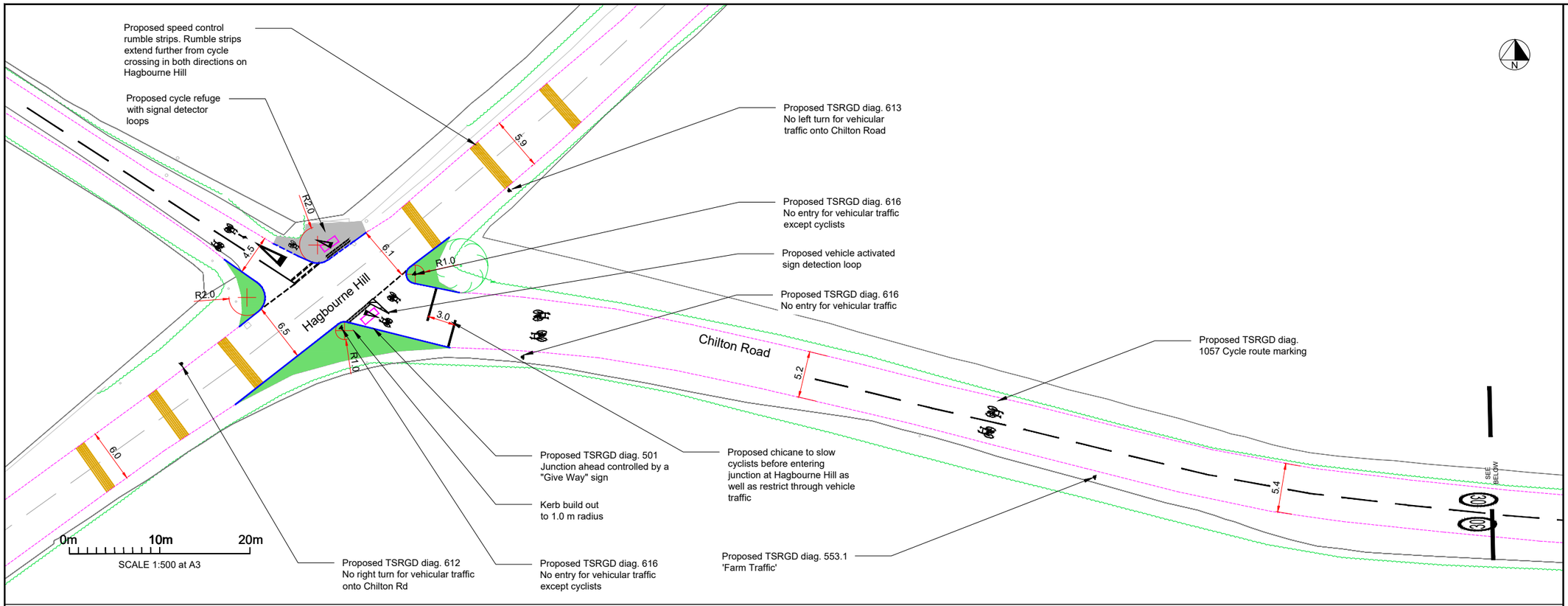
In the location of the current traffic calming chicane and island near the residential area near London Road, it is proposed that the island is replaced with a gate and 1.5m cycle bypass.

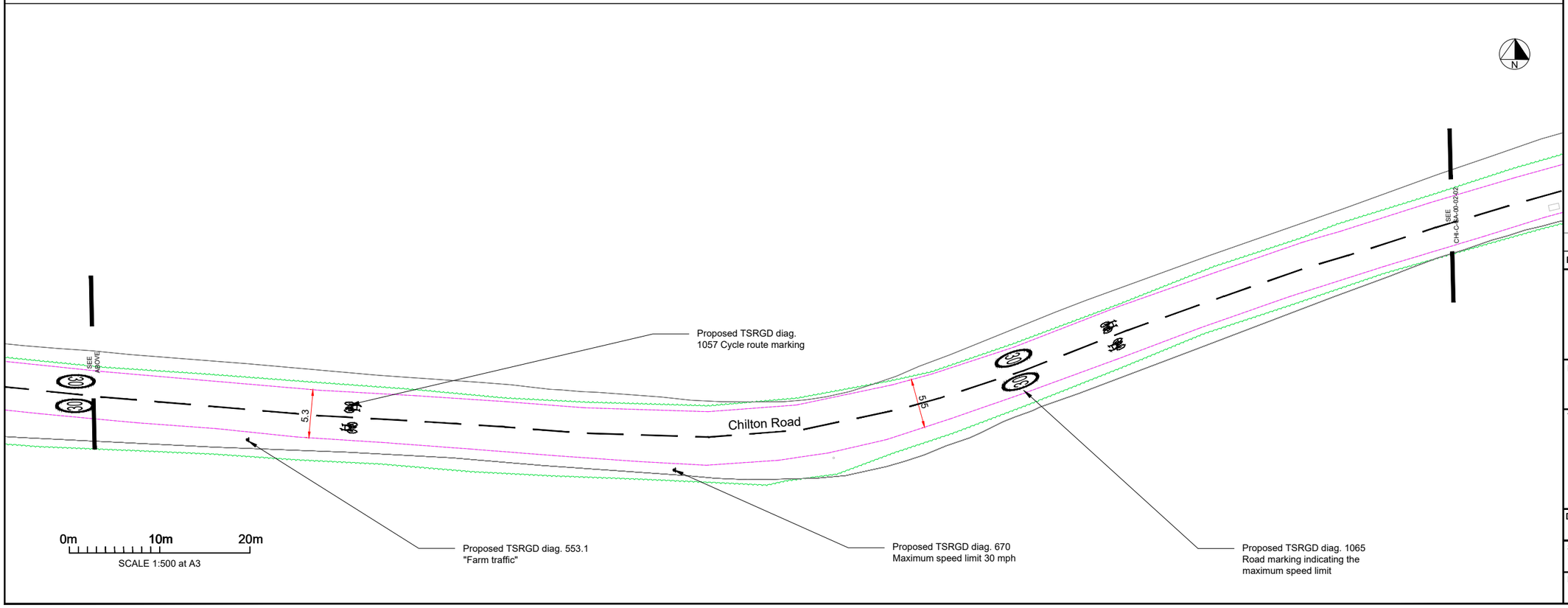
It is proposed that the speed limit is lowered to 30 miles per hour on Chilton Road.

Summary of design options	1: One-way with two-way cycle track	2. Full closure	3. Two-way 'Quiet Lane'	Commentary
Improvement in walking and cycling conditions	✓✓	✓✓✓	✓	Option 2 gives the most significant improvement in safety for walking and cycling and therefore offers the greatest chance of modal shift.
Road safety	✓✓	✓✓✓	✓	No option was deemed unsafe by the Road Safety Audit, but there is a greater risk of vehicles coming into conflict in Options 1 and 3.
Physical traffic calming required	Yes	No	Yes	Some form of physical traffic calming measure, e.g. speed humps, is necessary to slow through vehicles which currently travel over 40mph.
Ease of construction	✓	✓✓✓	✓✓	Option 2 requires the least physical infrastructure.
Cost estimates (inc. 20% contingency)	£202,000	£154,000	£179,000	Option 2 is cheapest as it requires least physical infrastructure.
Deterrent to anti-social behaviour (e.g. fly tipping, travellers)	✓✓✓	✓✓	✓✓✓	Options 1 and 3 retain active use of the road for through vehicles, while Option 2 has the option of a gate at the eastern end of Chilton Road.
Ease of maintenance	✓✓	✓✓	✓	Option 3 includes painted cycle lanes, Option 1 has kerbs and bollards, while Option 2 has gates with keys.
Emergency access in case of blockage of Hagbourne Hill	✓✓	✓	✓✓✓	Option 3 retains through vehicle movements in both directions, although slowed by speed humps. Option 1 retains only westbound through vehicle movement. Option 2 prevents all through movement, but barriers could be modified.

Concept design drawings: Full closure

Concept design drawings of the preferred option follow.





Key:

- Proposed resurfacing of verge
- Proposed planting / SUDs
- Proposed vehicle activated sign detector loop
- Proposed dropped kerb
- Proposed kerb
- Existing kerb
- Proposed white line marking
- Existing line markings
- Proposed speed control rumble strips
- Proposed chicane
- Proposed sign post and sign
- Existing tree

Notes:

1. Vehicle Activated signs (VAS) proposed at the cycle refuges to the east and west of Hagbourne Hill on Chilton Rd.
   - 1.1. VAS are activated when a cyclists stops over the detection loop
   - 1.2. VAS sign to be set positioned 90 metres from junction
   - 1.3. The digital signs located on Hagbourne Hill will display a warning message to oncoming vehicles as they approach the junction
   - 1.4. The message will indicate for cyclists to slow down and warn that cyclists are crossing ahead
2. Improve cycle crossing facilities at junction
3. Tighten geometry to reduce vehicle turning speeds
4. Introduce speed limit of 30 mph on Chilton Road
5. 85th percentile speed is 43.5 mph on Chilton Road
6. A road closure completely mitigates the danger of collision between vehicles travelling at high speeds and vulnerable road users such as cyclists and pedestrians

General Notes:

1. All dimensions in metres, unless otherwise noted.
2. Do not scale off plan.
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Project:
Traffic Reduction on Chilton Rd

Title:
Option 2
Full closure to vehicles
Sheet 1 of 4

Drawn:	Check:	Appr:	Date:	Scale at A3:
SK	JG	OG	20/04/2020	1:500

Status: CONCEPT

Drawing No:	Revision:
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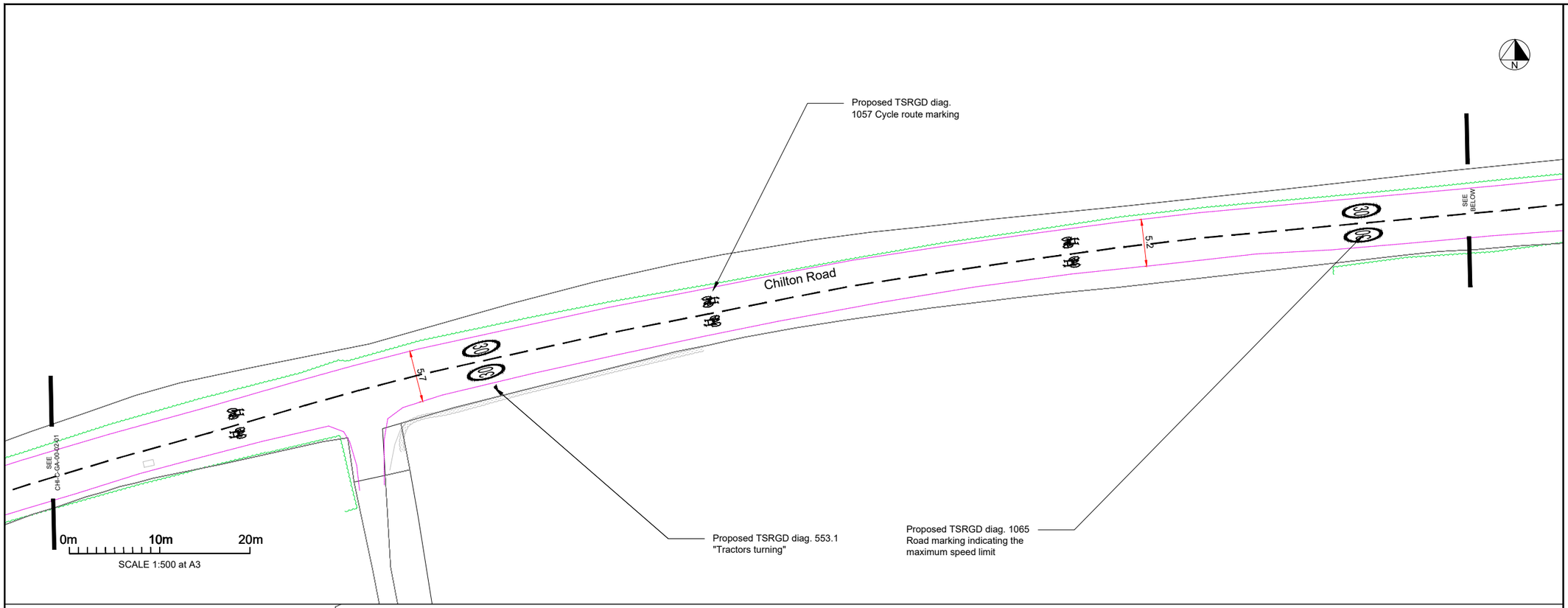

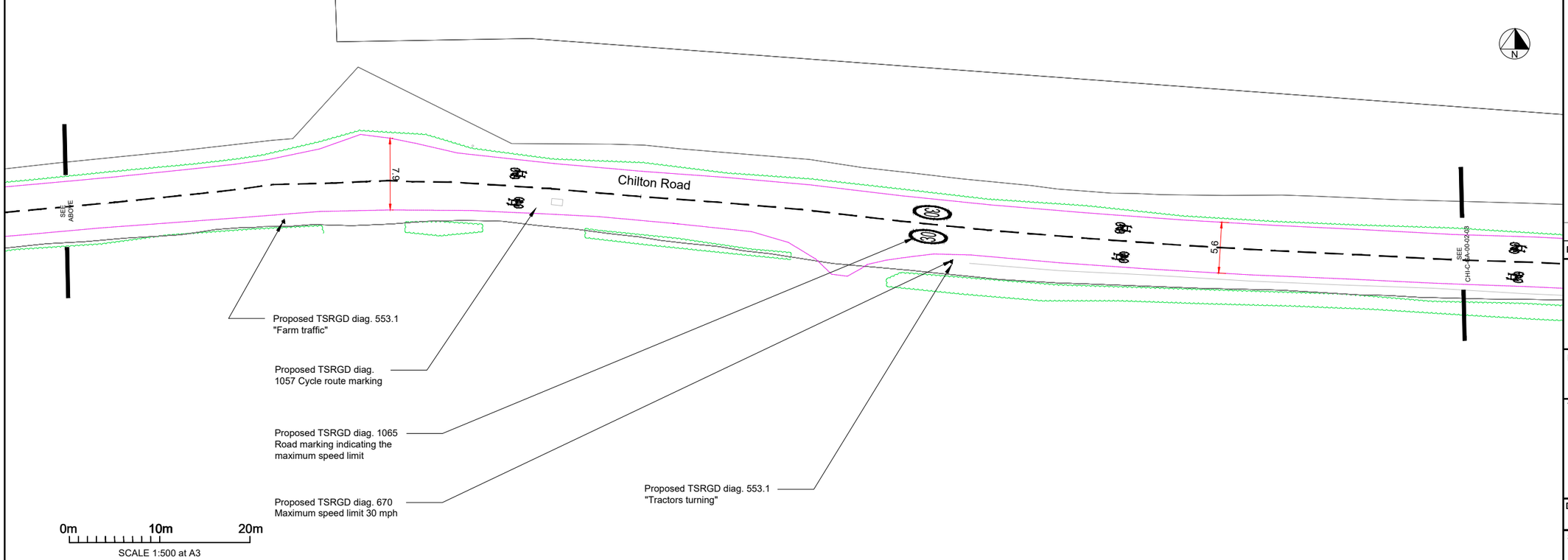

Key:

- Existing kerb
- Proposed white line marking
- Proposed sign and post

Notes:

1. 85th percentile speed is 43.5 mph on Chilton Road
2. A road closure completely mitigates the danger of collision between vehicles travelling at high speeds and vulnerable road users such as cyclists and pedestrians

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Project:
Traffic Reduction on Chilton Rd

Title:
Option 2
Full closure to vehicles
Sheet 2 of 4

Drawn:	Check:	Appr:	Date:	Scale at A3:
SK	JG	OG	20/04/2020	1:500

Status: CONCEPT

Drawing No:	Revision:
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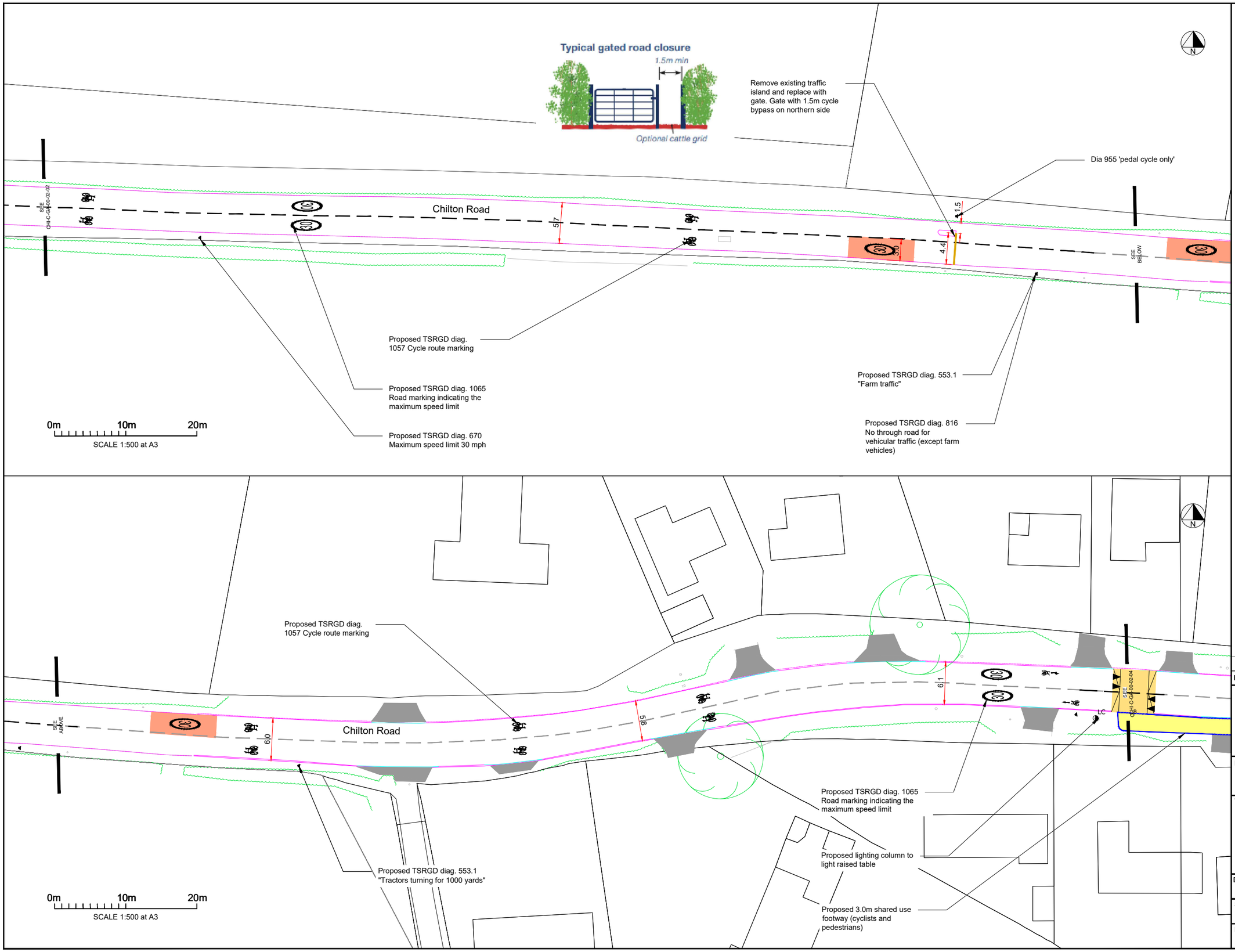

Key:

- Existing vehicle crossover
- Proposed red surfacing
- Proposed shared use path
- Raised table
- Proposed dropped kerb
- Proposed kerb
- Existing kerb
- Proposed white line marking
- Existing line markings
- Proposed gate with cycle bypass
- Proposed sign post and sign
- Proposed lighting column

Notes:

1. 85th percentile speed is 43.5 mph on Chilton Road
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14. For further information on drawing and design revisions, see decision log or contact Sustrans project manager.
15. This drawing has been produced to be read in colour, for the sheet size specified below. Printing or copying in black and white, or on a different sheet size may lead to misinterpretation of the design.

Rev	Description	Drawn	Check	Appr	Date
-					

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244-254 Cambridge Heath Rd London E2 9DA
020 7017 2350 www.sustrans.org.uk

Project:
Traffic Reduction on Chilton Rd

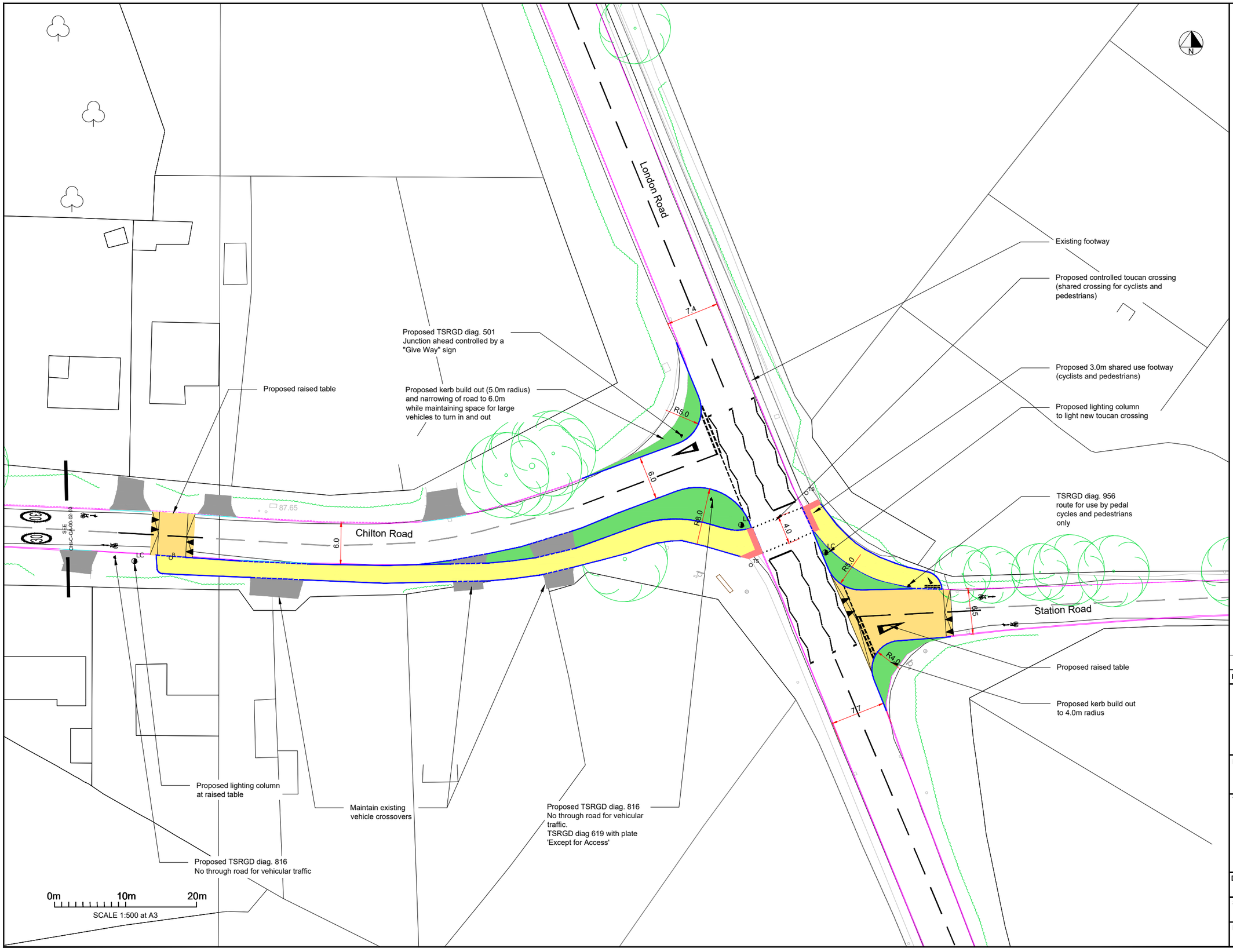
Title:
Option 2
Full closure to vehicles
Sheet 3 of 4

Drawn:	Check:	Appr:	Date:	Scale at A3:
SK	JG	OG	20/04/2020	1:500

Status: CONCEPT

Drawing No: CHI-C-GA-00-02-03

Revision: -



Key:

- Existing vehicle crossover
- Proposed controlled crossing tactile paving
- Proposed shared use path
- Proposed landscaping / SUDs
- Raised Table
- Proposed dropped kerb
- Proposed kerb
- Existing kerb
- Proposed white line marking
- Existing line markings
- Proposed bollard
- Proposed sign post and sign
- Proposed lighting column
- Existing bench
- Existing tree

Notes:

1. Tighten geometry on London Road junction with Chilton Road and Station Road to reduce vehicle turning speeds
2. Introduce toucan crossing to improve level of service for cyclists and pedestrians
3. Introduce 30 mph speed limit on Chilton Road
4. 85th percentile speed is 43.5 mph on Chilton Road
5. A road closure completely mitigates the danger of collision between vehicles travelling at high speeds and vulnerable road users such as cyclists and pedestrians

General Notes:

1. All dimensions in metres, unless otherwise noted.
2. Do not scale off plan.
3. Dimensions are to be checked by the contractor prior to commencement of work. Any discrepancy shall be reported immediately to Sustrans.
4. Drawing based on OS base plan.
5. Co-ordinates based on OS grid.
6. Levels based on OS datum (Newlyn).
7. This drawing is to be read in conjunction with all other relevant drawings and specifications.
8. All work shall be carried out in accordance with Oxford County Council statutory authority and health & safety requirements and regulations.
9. The position of services is based on information provided by other parties at the time of design and is for guidance only. It is the responsibility of the Client and Contractor to verify the exact position of any services before commencing works on site.
10. Temporary traffic works must be undertaken in accordance with Chapter 8 parts 1 & 2 of the Traffic Signs Manual, Safety at Street Works and Road Works Code of Practice 2013 and any other relevant H&S legislation.
11. These drawings have been produced under the CDM 2015 Regulations. The client is directed to their duties under Regulation 4 of CDM 2015.
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Project:
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Option 2
Full closure to vehicles
Sheet 4 of 4

Drawn:	Check:	Appr:	Date:	Scale at A3:
SK	JG	OG	20/04/2020	1:500

Status: CONCEPT

Drawing No: CHI-C-GA-00-02-04
Revision: -