COLIN BUCHANAN

Nicosia PT Enhancement

First Priority Cycling Network

Prepared by Colin Buchanan for
Ministry of Communications and Works (Republic of Cyprus)

September 2010

Ministry of Communications and Works (Republic of Cyprus)

Nicosia PT Enhancement

September 2010

First Priority Cycling Network (Sections 1 to 7)

TRANSPORT
TRAFFIC
DEVELOPMENT
PLANNING
URBAN DESIGN
ECONOMICS
MARKET RESEARCH

colinbuchanan.com

Nicosia PT Enhancement

First Priority Cycling Network (Sections 1 to 7)

Project No: 17151-02-1
September 2010

20 Eastbourne Terrace,
London,
W2 6LG
Tel: 020 7053 1300
Fax: 020 7053 1301
Email : London@cbuchanan.co.uk

Prepared by:	Approved by:
Philip Loy	Rob Goldup

Status: interim Issue no: 1 Date: 01 September 2010

17151-02-1_nicosia-preliminarycyclingnetwork_sections-1-7_v2a.doc

Contents

Tables

Figures

Front cover photo: Nicosia cyclists, early 1960s

Interim Report

This report is an interim output for the First Priority Cycling Network, focusing on Sections 1 to 7 as shown in the key plan overleaf, which is also included in the Appendix. There will be 14 drawings in total once the whole cycle network has been completed.

The drawing plans that accompany this interim report are listed as below:

Table S 1: Plan/ Drawing references

Section	Drawing no
Section 1	171512-OS-002/01
Section 2	171512-OS-002/02
Section 3	171512-OS-002/03
Section 4	171512-OS-002/04
Section 5	171512-OS-002/05
Section 6	171512-OS-002/06
Section 7	171512-OS-002/07

1 Introduction

1.1 First Priority Cycling Network

1.1.1 Colin Buchanan (CB) is commissioned by the Project Management Unit for the Nicosia Public Transport Enhancement Programme in the Ministry of Communications and Works (PMU), to prepare preliminary designs for the first phase of the cycle route network proposed in the Nicosia Integrated Mobility Master plan (IMMP). This First Priority Cycle Network is planned to be implemented by 2012. The two later phases of the network are to be implemented by 2016 and 2020.

1.1.2 CB's Cycling Expert visited Nicosia between 5 July and 16 July 2010. The main objectives of the visit were to:

- Discuss and agree the work plan with PMU
- Liaise with stakeholders to discuss aspirations and opportunities
- Undertake site visits to obtain written and photographic records of existing conditions.

1.1.3 With regard to the design work, the following was agreed in discussions with the PMU team:

- Optimal designs were sought for each section of the network rather than options
- On Grivas Digenis Avenue a segregated cycle track using the verge was the preferred option for PMU – CB was to make recommendations for surfaces
- At the Archangelou junction, design solutions for two-way cycling each side of the carriageway were sought to improve accessibility
- At the Prodromos Street scheme, PMU identified four design options to be assessed by CB
- At Makariou Avenue and Stasinou Street similar approaches were agreed, involving a two-way cycle track on one side of the carriageway - more detailed consideration was to be given to design solutions at the junctions
- At Gladstone Street/Museum Street junction designs were to incorporate wider proposals included in the IMMP

1.1.4 The First Priority network is affected by two on-going road improvement schemes - for the Archangelou junction and approach roads, and for the section of Prodromos Street north of Grivas Digenis Avenue. The provision made for cyclists within the designs for these road improvements was assessed as an early task in CB's work, and Technical Notes with recommended modifications to the current designs were issued to the PMU in August and September 2010.

1.1.5 It should be noted that this report and the accompanying designs were prepared prior to the meeting of the Working Group on 10 September. The designs therefore reflect the original brief from PMU and do not, as yet, take into account any decisions made at the Working Group meeting that may entail revisions to that brief.

1.2 Design standards

1.2.1 Although some Cypriot design guidance for cycling routes and infrastructure exists, there were no specific design standards for the First Priority Cycling Network.

1.2.2 Hence, the following have been used as the main reference documents for general design guidance. They include UK, Dutch and Danish design guides to draw on a wide range of sources and to include best practice from across Europe:

- London Cycling Design Standards, Transport for London, 2005 (UK)

- Cycle Infrastructure Design (LTN 2/08), Department for Transport, 2008 (UK)
- Design Manual for Bicycle Traffic, CROW, 2007 (Netherlands)
- Collection of Cycle Concepts, Road Directorate, 2000 (Denmark)

1.3 Place names

1.3.1 For consistency, the names of streets and other locations have been taken from the base plans supplied by the PMU. However, the spelling of place names in Nicosia does vary between mapping publications. For this reason Table 1.1 lists the names of more prominent locations used, together with any variations in spelling of them and other points of clarification. The references in square brackets are not official references but are used in the report and in the Technical Notes, so are included for clarity.

Table 1.1: Nicosia place names

Base Plan reference	Alternatives/ comment
Acheon Street	
Agiou Nikolaou Street	
[Archangelou junction]	Refers to the existing highway scheme
Archbishop Makarios III Street	Located in Engomi/Egkomi Municipality
Arkhangelos Street	
Ayois Prokopios Street	Prokopiou
Byron Avenue	Vyronos
Charalambos G Mouskos Street	
Chelon Street	Chilonos
Cinyras Street	Kinyra
Egypt Street	Aigyptou
Demos Herodhotou Street	Herodotou
Eleftheriou Venizelou Street	
Gladstone Street	Gladstonos
Grivas Digenis Avenue	
Heroon Street	Iroon
Hommer/ Homer Street	Omirou
Ion Street	Ionos
Lloyd George Square	
Louki Akrita Avenue	
March 25th Street	Martiou 25
Markos Drakos Avenue	
M Drakos Square	[Museum Street roundabout]
Metochioan Street	Metochiou
Michael Thoma Yeorgallas Street	Georgalla Street
Museum Street	Museiou
Nea Engomi Street	Neas Egkomis
October 28th Street	Oktovriou 28
Paphos Street	Pafou
Parthenon Street	
Pediaios River	Pedieos River
Prodhromos/ Prodromos Street	Prodromou (also refers to existing scheme)
Stasinos Avenue	Stasinou
St Chr Lenas Square	[Museum Street junction]
Tziabacharlal Nechrou Avenue	Nechrou
Vasilis Michaelides Street	

2 Commentary on route sections

2.1 Introduction

2.1.1 Drawing no. **171512-OS-001** in **Appendix 3** provides a key plan for the seven route sections described below. The preliminary designs for each section are presented on the accompanying drawings at scale 1:1000 scale (at A1 size), with insets of greater detail where required at 1:250 scale.

2.1.2 It should be noted that drawings are based on the base mapping supplied by the PMU team, supplemented where available by topographical surveys and/or detail from layout plans for the existing road improvement schemes referred to above. On sections not covered by topographic surveys or scheme layout plans the detail of the carriageway layout was not necessarily available from the base plans. Where this was the case, 'best estimation' of the carriageway layout has been used based on site observations and photographic records.

2.1.3 Each route section is discussed in turn below. The rationale for the proposed designs is explained and examples of design features given where appropriate. For each route sections the report discusses:

- Route characteristics and/or general design issues
- Route options (where relevant)
- Design options
- A commentary on the proposed designs highlighting key design details

2.1.4 Each Section is also started on a new page, so that they can be issued as separate documents to accompany the drawing to which it relates.

2.2 General measures – entire network

Signage/waymarking

2.2.2 Signage will be an important feature of any cycle network as it supports and provides coherence to a route, especially where the nature of provision changes or at the beginning or end of a route. It should indicate key destinations as well as distances or cycle journey times to them. (One or the other should be used consistently throughout a cycle network rather than a mixture of times and distances.)

Figure 2.1: Cycle signage in the UK using times instead of distance

2.2.3 Figure 2.1 shows an innovative example of cycle signage using times instead of distance. This can be relevant when trying to encourage new cyclists for whom a distance measurement can seem quite far if cycling has not been a regular activity, whereas quoting a journey time is more intuitively understood. Such signage is used for example in the Cycling England cycle demonstration towns[1] and in London's Cycle Superhighways[2].

2.2.4 Signage will also be important to warn drivers of the presence of cyclists, especially on streets that make up the First Priority Cycle Network. Such signage aims to improve the safety of cyclists.

[1] See http://www.dft.gov.uk/cyclingengland/
[2] See http://www.tfl.gov.uk/roadusers/cycling/11901.aspx

Figure 2.2: Warning sign currently in use in Nicosia

2.2.5 Figure 2.2 shows signage warning motorists of the presence of cyclists. At the moment such signage is not strategically placed and may consequently lose its effectiveness. Use of such signage in strategic locations along the First Priority Cycle Network would be of greater benefit.

Cycle parking

2.2.6 As cycle routes are developed and cycling increases, the need for cycle parking will also increase.

2.2.7 There are two basic types of parking:

- Short-term – this is typically on-street stands for visiting shops and other retail centres, or other destinations where stays are likely to be for short periods
- Long-term – residences and places of work should ideally have more secure parking arrangements for longer term parking (e.g. all day), ideally with restricted access, depending on the particular circumstances.

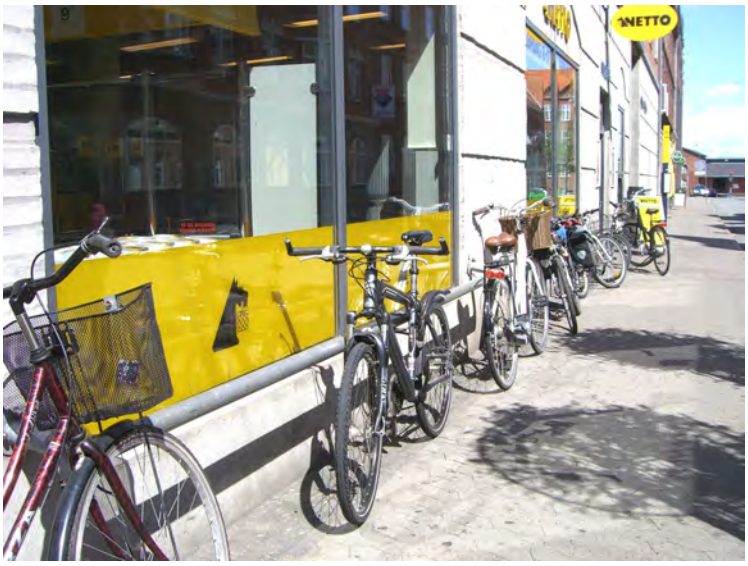
2.2.8 Short term parking requirements are likely to be required for retail areas such as:

- Shopping along October 28th Street
- Shopping along Agiou Nikolaou Street
- Shopping at Prodromos Street/Herodotou Street

2.2.9 Long term parking will be required for:

- University of Nicosia
- European University
- Other large places of employment

Figure 2.3: Cycle parking – supermarket



2.2.10 Figure 2.3 shows short-term cycle parking in Denmark, consisting of a single rail placed at a suitable height outside the front of the premises. It should be noted that on-street cycle parking should ideally enable locking of the bicycle frame and at least one wheel.

Figure 2.4: Cycle parking – secure area

2.2.11 Figure 2.4 shows cycle parking located within a secure structure. Access is provided to residents or employees with keys or a swipe card. The stands themselves are the 'Sheffield stand' type, which is suitable for both on-street and secure parking.

2.3 Section 1 – drawing no: 171512-OS-002/01

Route characteristics

2.3.2 The salient route characteristics for Section 1, and key issues/opportunities arising, may be summarised as follows:

- The Grivas Digenis Avenue route corridor is a major arterial traffic route from the west into Nicosia city centre
- It is characterised by high traffic volumes and speeds
- Parallel service roads offer an opportunity for cycle route provision but have one-way operation in some sections and physical restrictions in others
- Existing grassed verges line either side of the main carriageway of Grivas Digenis Avenue for much of its length from the University of Nicosia to just east of the junction with March 25th Street

Route options

2.3.3 At the western end of the corridor the PMU brief raises the possibility of using residential streets that eventually lead to the existing cycle track parallel to October 28 Street (on the eastern side) to link the University of Nicosia to Grivas Digenis Avenue, as an alternative to the route shown on the IMMP network plan.

2.3.4 However, given the points of access for the university site on Andrea Papandreou Street with access from adjoining roads, it makes more sense to start a cycle route adjacent to Grivas Digenis Avenue west of the junction with October 28 Street as this allows a simpler and more direct alignment with the rest of the cycle route to the city centre and old city. Also, October 28 Street has to be crossed at some point anyway, and facilitating this crossing at the junction with Grivas Digenis Avenue provides scope to improve conditions for pedestrians and cyclists on an existing crossing.

Figure 2.5: Links to University of Nicosia

Background image source: Microsoft Bing Maps

2.3.5 Figure 2.5 is based on a satellite image and shows cycle route options at the University. The solid yellow line indicates the proposed route. The dotted yellow line indicates a possible extension through the car park right into the university site. The red dotted line indicates the option in the PMU brief referred to above (note that rights of access through areas of land indicated have not been confirmed). The two yellow arrows indicate vehicle entrances to the university.

2.3.6 Under the IMMP proposals the cycle route would cross from the south side of Grivas Digenis Avenue to the north side in the vicinity of the Nea Engomi Street junction. CB has considered the alternative possibility of making this crossing at a new signalised crossing at the junction with October 28 Street, approximately 525 metres further west. (Indeed there are existing carriageway markings suggesting that a crossing has previously been proposed here). However, this would involve the installation of new signals.

2.3.7 Given that there is an existing crossing at Nea Engomi Street which can be widened to accommodate shared-use for pedestrians and cyclists, utilising the Nea Engomi Street crossing would be the more practical if the cycle route is, indeed, to cross to the north side of Grivas Digenis Avenue.

2.3.8 It is noted that following discussions between the PMU and the Town Planning Department, whether the cycle route crosses to the north side of Grivas Digenis Avenue or remains on the south side now depends on the design solution adopted at the Archangelou junction, which has yet to be finally determined. Given the objective of linking the University of Nicosia to the centre of the city, there is no intrinsic advantage to having the cycle route on one side or the other. However the number of crossing points should be kept to a minimum, while the crossing points themselves should be located and designed for the safety and convenience of pedestrians and cyclists.

Design options

2.3.9 Cycle lanes on the main carriageway of this section of Grivas Digenis Avenue should be ruled out as the speeds and volumes of traffic are too high for a comfortable cycling environment. For example, European design guidance suggests flows of greater than 4,000 pcu per day and vehicle speeds of over 30km/hour as thresholds to consider segregated tracks[3]. Data supplied by PMU shows traffic levels of over 11,000 vehicles a day (May 2008) along Grivas Digenis Avenue. Data for recorded vehicle speeds was not available but the signed speed limit is 50 km/hour, while on-site observation suggests that actual speeds may be even higher.

2.3.10 The project brief suggests the possibility of using the service roads along Grivas Digenis Avenue for the cycle route with cyclists on the carriageway of the service roads, with the possibility of converting the service roads to one-way operation. However, it was agreed with the PMU after site visits that a design for a largely two-way segregated track be pursued for the cycle route along Grivas Digenis Avenue which would utilise space within the existing grassed verges. This option has the advantage that its implementation only requires modification of existing kerbed areas as opposed to having to modify the carriageway, and would not require as many traffic management changes as the 'on road' option.

2.3.11 A target width of 4.0 metres is proposed for the sections of two-way cycle track within the verge, to provide a comfortable width for cyclists. This will need to be reduced where space is restricted, but this only applies in one or two locations and so presents no significant issues.

2.3.12 It is recommended that a sealed surface is used for the segregated cycle tracks located within the verges, to reduce the need for maintenance and prolong the life of the path in all weather conditions.

Commentary on proposals

2.3.13 Hence, over this section it is proposed that a two way cycle track be provided within the grassed verges on the south side of Grivas Digenis Avenue, aligned as indicated in drawing no: 171512-OS-002/01. The proposed cycle track commences at the verge between Porfyriou Dikeou and the south side of Grivas Digenis Avenue. There is the possibility of extending the track up to and through the car park up to the university site itself.

2.3.14 At October 28th Street junction it was agreed with the PMU that designs removing the left-turn slip lane could be proposed. This simplifies the crossing arrangement as it removes the splitter islands, making crossing easier and safer for pedestrians and cyclists as the left-turn slip lane is now uncontrolled and the waiting area on the island adjacent the slip lane is very restricted (see Figure 2.6).

[3] CROW, Design Manual for Bicycle Traffic (NL 2007)

Figure 2.6: October 28th Street junction with Grivas Digenis Avenue

2.3.15 Figure 2.6 shows the alignment of the existing pedestrian crossing at the junction with October 28th Street, looking east. The crossing currently has to be completed in three stages due to the left-turn slip lane on Grivas Digenis Avenue. Given the restricted space for pedestrians in the existing layout and the absence of a controlled crossing of the slip lane, pedestrian safety and convenience is compromised. The proposal is to remove the left-turn slip lane and modify the crossing so that it can be completed in one stage, with a pedestrian/ cyclist phase integrated into the signal stages.

2.3.16 No modelling has been undertaken to assess the impact of these proposals on traffic capacity. However, any adverse impacts can be mitigated with on-demand operation using push-button control for both pedestrians and cyclists so that a green phase for the crossing only operates when required.

2.3.17 Adjacent to Akhei Street the grassed verge slopes down towards main carriageway. This should ideally be compensated for with either a stepped path or having the path dug out to the lower level to ensure the whole path width is as near level as is practical to achieve.

Figure 2.7: Verge alongside Akhei Street

2.3.18 Figure 2.7 shows a section of grassed verge between Grivas Digenis Avenue and Akhei Street. The sloping red line indicates where there is lateral slope in the surface of the verge. The yellow circles indicate obstructions. In the far distance is an advertising structure which should be removed or relocated away from the proposed cycle track. In the foreground, the drain should ideally be re-built to be level with the surface with a cover, whilst the cycle track can be laid around the existing tree without it having to be removed. Any space restrictions from existing trees are sufficiently few to warrant retaining a feature that enhances the ambience of the route.

2.3.19 Similar approaches to obstructions should be applied throughout, i.e.:

- Trees: build cycle track around existing base
- Low-lying vegetation: trim back to provide space for cycle track
- Drains/access covers etc: re-build level to pathway where practicable
- Electrical/signal boxes: build the cycle track around the feature as a first option if the pathway can be widened to compensate, otherwise relocate (see Figure 2.8)
- Advertising hoardings: these should be relocated away from the cycle path where they obstruct access.

2.3.20 Use of high visibility carriageway markings and/or raised tables is proposed where the cycle route crosses accesses to the service roads (see section B-B in drawing). The positioning of the crossings are located further in from the main carriageway of Grivas Digenis Avenue to allow vehicles time to slow and to improve visibility of the cycle route to approaching drivers. There is sufficient clearance for one and possibly two vehicles to wait and give way to the cycle route when entering the access road from Grivas Digenis Avenue.

2.4 Section 2 – drawing no: 171512-OS-002/02

Route characteristics

2.4.2 Section 2 is similar to Section 1 in terms of its characteristics, issues and opportunities, in that:

- The Grivas Digenis Avenue route alignment corridor is a major arterial traffic route from the west into Nicosia city centre
- It is characterised by high traffic volumes and speeds
- Parallel service roads offer an opportunity for cycle route provision but have one-way operation in some sections and physical restrictions in others
- Existing grassed verges line the main carriageway of Grivas Digenis Avenue to just after the junction with March 25th Street

Route options

2.4.3 Given the desired alignment of the First Priority Cycling Network through the Archangelou junction, the point at which the cycle route has to cross Grivas Digenis Avenue is a key consideration (note 2.3.8 above).

2.4.4 The PMU brief proposed that the cycle route to cross Grivas Digenis Avenue at the junction with Nea Engomi Street and then continued eastwards along the northern side. Continuing the cycle track on the southern side east from Nea Engomi Street would mean trying to overcome space restrictions on the footway due to existing features and developments just after the car park of the Hilton Hotel.

2.4.5 The benefits of switching the cycle path to the north side of the road at this point include that:

- It allows use of an existing crossing to pursue the recommendations for Grivas Digenis Avenue as it approaches the junction with Archangelou junction contained in the Technical Note of 12th August 2010
- It links to Metochioan Street and Chelon Street as an alternative route to the city centre as these streets are identified in the IMMP.

Design options

2.4.6 The option of utilising space within the grassed verges for a two-way segregated cycle track alongside the main carriageway of Grivas Digenis Avenue exists along this section as in Section 1. The verge along the northern side of Grivas Digenis Avenue is continuous, whereas there are restrictions along the southern side such as a hotel car park and a cemetery where a verge alongside the footway is absent.

2.4.7 A target width of 4.0 metres is proposed for the sections of cycle track within the verge alongside Grivas Digenis Avenue to provide a comfortable width for cyclists. This will need to be adjusted where space is restricted, but this is only one or two locations so should pose no major issues. The verge narrows considerably over a short section, between Nea Engomi Street and Grammou Street as indicated in the drawing. However, the existing footway and proposed cycle track can be combined to form a single shared surface for this narrower section.

2.4.8 It is recommended that a sealed surface is used for the segregated cycle tracks located within the verges to reduce the need for maintenance and prolong the life of the path in all weather conditions.

Commentary on proposals

2.4.9 It is proposed to use the grassed verges in this section to accommodate a two-way cycle rack, aligned as indicated in drawing no: 171512-OS-002/02, with the route crossing to the north side of Grivas Digenis Avenue at the junction with Nea Engomi Street. The crossing area across the carriageway on two arms at the junction with Nea Engomi Street will be widened to accommodate pedestrians and cyclists.

Figure 2.8: Existing footway at Nea Engomi Street junction

2.4.10 The footway area at the Nea Engomi Street junction will be increased to accommodate shared-use. Figure 2.8 shows the existing footway on the western side of the junction. The gap between the paved areas can be filled in to provide a larger area for shared use by pedestrians and cyclists. This would also allow greater room for manoeuvre and may obviate the need to relocate features such as the electrical box (shown in the middle of photograph) as cyclists will be able to manoeuvre around it.

2.4.11 Similar approaches to obstructions within the verges should be adopted as described for Section 1, i.e.:

- Trees: build cycle track around existing base
- Low-lying vegetation: trim back to provide space for cycle track
- Drains/ access covers, etc: re-build level to pathway where practicable
- Electrical/ signal boxes: build the cycle track around the feature as a first option if the pathway can be widened to compensate, otherwise relocate
- Advertising hoardings: these should be relocated away from the cycle path where they obstruct access.

2.4.12 Also as in Section 1 use of high visibility carriageway markings and/or raised tables is proposed where the cycle route crosses access to service roads. The positioning of the crossing points are located further in from the main carriageway to allow vehicles time to slow and to improve visibility of the cycle route to approaching drivers. There is sufficient clearance for one and possibly two vehicles to wait and give way to the cycle route when entering the access road from Grivas Digenis Avenue. The entrance just to the east of Nea Engomi Street has been closed off but requires a build out to prevent parking across the potential pathway alignment.

2.4.13 At the March 25th Street junction it was agreed with the PMU that designs removing the left turn slip lanes would be proposed. This simplifies the crossing arrangement as it removes the splitter islands, making crossing easier and safer for pedestrians and cyclists.

Figure 2.9: March 25th Street junction

2.4.14 Figure 2.9 shows the junction of March 25th Street and Grivas Digenis Avenue. The existing pedestrian crossing is not satisfactory as it requires crossing two uncontrolled slip lanes as well as the main carriageway in three stages, if not five including the need to get to the frontage of buildings which requires crossing the service roads. There are also planters placed on the island which impede pedestrian movement. It is proposed that the slip lanes are removed as they offer no significant benefit in terms of traffic management (as they cannot be used when there is a traffic queue of more than two to three vehicles), and they therefore pose an unnecessary hazard for pedestrians.

2.4.15 A crossing signal phase should be incorporated in the signals and designed so that the junction can be crossed in one stage.

2.4.16 No modelling has been undertaken to assess the impact of these proposals on traffic capacity. However, any adverse impacts can be mitigated with on-demand operation using push-button control for both pedestrians and cyclists so that a green phase for the crossing only operates when required.

2.5 Section 3 – drawing no: 171512-OS-002/03

Route characteristics

2.5.2 Key features of Section 3 are:

- Extensive works are currently underway at the Archangelou junction and adjoining streets – any amendments proposed to the current designs for these works would require negotiation with the contractor
- Proposals to build a car park at the north west corner of the Archangelou junction provide an opportunity to provide a wider pathway adjacent Grivas Digenis Avenue

Route options

2.5.3 Works were already underway at the Archangelou Junction when this study commenced. As the cycle route proposals could involve changes to the design of those works, PMU requested that design issues here be addressed as an urgent early task. These were reported on in a Technical Note issued on 12 August 2010 with drawing no. **171512-OS-003**. The proposals for the Archangelou scheme were as summarised below. Their rationale is discussed in the Technical Note which is included in Appendix 1.

2.5.4 The IMMP highlights a route via Metochioan Street/Chelon Street as part of the cycle network to be established by 2016. The development of Metochioan Street/Chelon Street as a cycle route could potentially provide a direct alignment to central Nicosia from the point at which Agiou Nikolauo Street merges with Grivas Digenis Avenue. Utilising the existing streets to link Agiou Nikolaou Street to Metochioan Street would provide a direct alternative link for the Grivas Digenis Avenue cycle route alignment. The advantage of this route alternative would be:

- It is a more direct route to the centre of Nicosia
- Very little is required to make the streets between Agiou Nikolauo and the Ayois Prokopios Street/Metochioan Street junction cycle friendly as much of the route can be aligned along quiet residential streets

Design options

2.5.5 The original proposal for the Archangelou junction was to install one-way cycle tracks either side of the main carriageway over the sections being re-constructed. The Technical Note of 12 August 2010 outlined reasons why it would be preferable to design for two-way cycling on paths either side of the carriageway. This would create an alignment that is more convenient for cyclists as it takes into account realistic desire lines, especially for the First Priority Cycling Network.

Commentary on proposals

2.5.6 Key design proposals for the route section covered by the Archangelou Scheme are:

- Design for two-way cycling on both sides of the highway, but with priority for the section that is proposed as part of the First Priority Cycle Network, along the northern side of Grivas Digenis Avenue - this runs across the Grigori Afxentiou Street and Iakovou Patatastou Street junctions, through the main Archangelou junction, and along Ayois Prokopios Street up to the point at which it meets the two-way pedestrian and cycle pathway that forms the northern boundary of the Kykkos Monastery gardens (see Drawing no. 171512-OS-003)

- Design the pathway without any physical demarcation between pedestrians and cyclists, providing a level surface across the full width of the pathway

- Modify the proposed central island on Grivas Digenis Avenue by narrowing the island to permit widening of the parallel footway, allowing a footway width of 6.0 metres between Iakovou Patatsou Street and Grigori Afxentiou Street
- Utilise the space between the proposed car park (opposite the Kykkos Monastery) and the highway for pedestrians and cyclists - in the current proposals for the Archangelou scheme the combined width from the kerb line to the line of existing trees should allow an effective pathway width of at least 5.0 metres for the full length of the path up the crossing on Agios Prokopios Street
- Provide junction treatments on Grivas Digenis Avenue at the junctions with Grigori Afxentiou and Iakovou Patatsou, and on Ayois Prokopios Street at the entrance to the proposed car park
- Ensure that the signalised and zebra crossings on Ayois Prokopios Street (by the car park entrance) cater for cyclists as well as pedestrians
- For the cycle track to the west of Grigori Afxentiou junction, investigate the acquisition of land adjacent to the car park to provide a wider two-way cycle track
- Modify the proposed central carriageway island on Ayois Prokopios Street by narrowing the island to permit widening of the parallel footway, allowing a footway width of 5.0 metres between the signalised crossing and the two-way pedestrian and cycle pathway that forms the northern boundary of the Kykkos Monastery gardens (see Section 4 also)

2.5.7 Junction treatments are proposed for the junctions of Grigori Afxentiou Street and Iakovou Patasou Street. Ideally these should be raised tables as a physical measure is more likely to have a traffic calming effect than either signage or carriageway markings alone, especially at the junction with a busy road such as Grivas Digenis Avenue.

2.5.8 At the junction with Grigori Afxentiou a separate two-way cycle track and footway commences on the western side, whilst a shared-use pathway commences on the eastern side. The width of the crossing should ensure that it links with both cycleway and footway on the western side.

2.5.9 Although not part of the First Priority Cycle Network, Advance Stop Lines should be installed at the Ayois Prokopios Street/Metochioan Street junction, especially for the east-west alignment in anticipation of the development of a cycle route along the Agiou Nikolaou Street to Metochioan Street alignment as outlined above. These can be installed without altering the proposed carriageway and kerb lines, but turning movements will need to be taken into account to minimise potential conflicts e.g. between left-turning motor vehicles and cyclists heading straight through the junction.

2.6 Section 4 – drawing no: 171512-OS-002/04

General Issues

2.6.2 At its western end this section of the cycle route is also affected by the works currently underway at the Archangelou junction and adjoining streets. The issues and opportunities arising are as described for Section 3.

2.6.3 To the east there are four route options for the section from the Kykkos Monastery Gardens to the Pedieios river crossing, which are discussed under Section 5.

Route options

2.6.4 The pedestrian/cycle pathway alongside the northern boundary of the Kykkos Monastery Gardens forms part of the route alignment identified by the PMU team. This is an existing facility providing a traffic-free link which requires little in the way of works to improve it.

2.6.5 However, the adjoining pedestrian/cycle pathway running from Ionas Nikolaous Street to Michail Karaoli Street is very different in that it has extensive railings installed, to such an extent that they are a physical impediment for both pedestrians and especially cyclists. It should be noted however that alternative access for the cycle route alignment could be provided through Antistaseos Street.

2.6.6 A possibility that is not highlighted in the original brief is the facilitation of cycling along the Grivas Digenis Avenue alignment into central Nicosia. As the footway is more restricted east from the Archangelou junction and there is not the same opportunity for utilising verges, the likely solution would be on-carriageway cycle lanes. Although this section of Grivas Digenis Avenue has high traffic volumes, it is different in character to Sections 1 and 2 as it is in a more urban environment further into the city, with frontage activity closer to, and adjacent the carriageway. More frequent junctions and greater congestion means that average traffic speeds are likely to be lower. However, the option of on-carriageway cycle lanes Grivas Digenis Avenue is not recommended for the First Priority Cycling Network but for later phases of implementation as it would be better suited to experienced cyclists.

Design options

2.6.7 For Ayois Prokopios Street the current proposal is to install one-way cycle tracks either side of the main carriageway over the section being re-constructed. The Technical Note of 12 August 2010 outlined reasons why it would be preferable to design for two-way cycling on the path either side of the carriageway. This would create an alignment that is more convenient for cyclists as it takes into account realistic desire lines, especially for the First Priority Cycling Network.

Commentary on proposals

2.6.8 On the pathway alongside Kykkos Monastery Gardens it is recommended that the existing railings are either removed, or placed further apart if it is deemed necessary to keep them. Access should be improved to the adjoining streets on the north side, e.g. by installing dropped or ramped kerbing as appropriate.

2.6.9 At the pathway from Ionas Nikolaous Street to Michail Karaoli Street it is recommended that all the railings are removed for the entire length of the path and that the gulley is filled in to provide a level surface across the full width of the pathway. The priority for this treatment is the northern section from the Kykkos Monastery Garden to Iona Nikolaou as this forms part of the First Priority Cycling Network and is much narrower.

Figure 2.10: Pedestrian/ Cyclist Pathway to Iona Nikolaou

2.6.10 Figure 2.10 shows the existing situation where railings have been installed to such an extent that they obstruct access by bicycle and can also impede wheelchair access. The proposal is to remove all the railings along the path, with an option to retain a chicane feature at each end where the path joins the street network to discourage motorcyclists. The dropped level in the pathway should be filled in to provide a level surface across the full width of the pathway.

2.6.11 Kerb build-outs are commended at the entrances to the path to discourage parking which obstructs access to the pathway for pedestrians and cyclists.

2.6.12 The contraflow design for eastbound cyclists on Ionas Nikolaous Street has an advisory lane marking with islands at each end to allow access to the building frontages. This has the disadvantage that parked vehicles are able to park on the carriageway and block the contraflow path. This can be mitigated by existing parking restrictions being extended along the whole section of the contraflow, and enforced. However, this section is also a quiet residential street and quite wide, and cyclists should be able to negotiate parked vehicles reasonably safely.

2.6.13 On Ion Street, traffic calming measures are proposed instead of cycle lanes or tracks for the following reasons:

- The high degree of variation in the width of the carriageway in the lower section due to the unfinished nature of the carriageway edge which lacks a defined kerb
- High demand for on-street parking and incidence of 'informal' parking
- The higher cost and technical requirements to install segregated lanes
- The fact that Ion Street is a service road with much lower traffic volumes and speeds compared to Prodromos Street and Grivas Digenis Avenue.

2.6.14 See Section 5 for a fuller discussion of design options.

2.7 Section 5 – drawing no: 171512-OS-002/05

General issues

2.7.2 A contract has been awarded for a works to develop the highway corridor of Prodromos Street north of Grivas Digenis Avenue. This affects design proposals for the First Priority Cycling Network as the proposed route alignment intersects Prodromos Street at a key junction.

Route/design options

2.7.3 The PMU team requested that four route options be explored for the section from Iona Nikolaou to the point on the River Pedieios where the route crosses into Gladstone Street. Part of this section was to be re-modelled under the Prodromos Street road improvement contract referred to above. A Technical Note with drawing nos. **171512-OS-004** to **171512-OS-007** was issued to the PMU on 04 September 2010 exploring these options with suggested modifications to the current designs for the road improvement contract. This Technical Note is included in Appendix 2 and should be referred to for a full description and assessment of the options.

2.7.4 The four options identified by PMU and addressed in the Technical Note, are:

- Option (a) - Drawing no. 171512-OS-004: This option provides a combined footway and one-way cycle track on either side of Prodromos Street. Crossing points at the Ion Street junction and Herodotou Street/Prodromos Street junction are required, with the possibility of reducing the lane widths in Prodromos Street to 3.5 metres.

- Option (b) - Drawing no. 171512-OS-005: This option provides for a shared-use footway and 2-way cycle track on the south side of Prodromos Street

- Option (c) , Drawing no. 171512-OS-006: Using Georgalla Street to cross Prodromos Street from Ion Street, turning right through a passage to be created (with land acquisition) between two empty plots then turning left into Herodotou Street. This option introduces a mini-roundabout on Prodromos Street at the junction with Ion Street, with the option of the same treatment at the junction with Herodotou Street.

- Option (d), Drawing no. 171512-OS-007: This alignment uses Vassili Michaelide instead of Ion Street with a right turn into Sina Street. Both directions are aligned on the north side of Sina Street where a 4.0-metre pavement is proposed. The route joins Gladstone Street via a crossing over Prodromos Street and an access road to the proposed Pedeios river route.

Comments on options (Prodromos Street Scheme)

2.7.5 Option (a):

- The crossing of Prodromos Street north/eastbound utilises the right-turn lane arrangement to cyclists' advantage. An island is proposed to enhance safety as this will be a waiting area to cross Prodromos Street in two stages.
- A shared-use footway is proposed on the north side to provide a direct link to Herodotou Street and minimise the need to interact with traffic on the busier Prodromos Street.
- The crossings in the original design are utilised for the south/westbound direction. A shared-use footway is proposed on east and south side to minimise the need to interact with traffic on the busier Prodromos Street

2.7.6 Option (b):

- A shared-use path on the south side means that there is the potential for a single crossing point into Herodotou Street for both northbound and southbound cyclists, with the appropriate signalling arrangement for simultaneous crossing in both directions.
- The splitter island in the junction mouth of Ion Street is used to cyclists' advantage by utilising it as a waiting area for joining the shared-use path. An alternative to this design is for northbound cyclists to join the shared use path at the same point that southbound cyclists re-join the carriageway. The width of the dropped kerb would need to be increased.

2.7.7 Option (c):

- The main feature of this option is to acquire and use open land to facilitate a new pathway into Herodotou Street from Georgalla Street without using the more easterly junction at Prodromos Street. The new pathway includes a pedestrian path to improve general accessibility for both pedestrians and cyclists.
- The crossing of Prodromos Street is achieved with a mini-roundabout at the junction with Ion Street and Georgalla Street, with the option of the same treatment at the junction with Herodotou Street

2.7.8 Option (d):

- This alignment uses Vasilis Michaelides Street and is possibly the least complicated option as any potential changes to the Prodomou scheme designs are limited to the periphery of the scheme which is not on Prodromos Street itself but Sina Street
- The cycle route in both directions is aligned on the north side of Sina where a 4.0-metre footway is part of the original design, which is proposed to be an undemarcated shared use path. The design can be adapted to accommodate the existing layout of the trees, with the possible exception where access is required onto the path from the mini-roundabout.
- The route alongside the Pedieios River also needs to be developed so that it joins Gladstone Street via a crossing and an access road.

Commentary on proposals (general)

2.7.9 For all options, a carriageway warning sign is proposed for several side streets that adjoin either Ion Street or Vasilis Michaelides Street. Carriageway markings are more appropriate for these streets as they are quieter residential streets and carriageway markings would provide a lower cost option.

Figure 2.11: Junction treatments – carriageway markings

2.7.10 Figure 2.11 shows an example in London where carriageway markings have been used to highlight the presence of cyclists to drivers joining the road from a side street in a residential area. This has been used as the street is one-way for motor vehicles but two-way for cyclists. A similar treatment is proposed for Ion Street or Vassili Michaelide but with the following differences:

- The carriageway markings are to be situated within the side street on the approach to the cycle route as opposed to on the cycle route itself (as in the photograph above)
- The colour of the markings should be a bolder colour such as red
- The cycle logo should be aligned to be seen by drivers as it is a warning for them as opposed to route information for cyclists.

2.7.11 Three of the four options for the alignment of the First Priority Cycling Network, Options (a) to (c), are aligned on Ion Street. The carriageway of Ion Street, especially the section between Ionas Nikolaous Street and Kimon Street, varies considerably. Use of cycle lanes in this section would not be satisfactory as they would have to attempt to delineate a safe passage through an irregular area with complex vehicle movements due to several building accesses and adjoining roads. However, with cyclists on the carriageway, physical traffic calming measures would ensure that all vehicles speeds can be controlled. For this reason a raised table and a mini-roundabout are proposed along Ion Street near the access to Grivas Digenis Avenue (between Ionas Nikolaous Street and Chr Mouskou Street) as (i) traffic would converge at this point as they exit or enter the main arterial road from surrounding streets, and (ii) the retail units in this vicinity will require access for service vehicles such as vans and lorries (see Drawing for Section 4 also).

Figure 2.12: Ion Street

2.7.12 Figure 2.12 shows Ion Street looking south, with Chr Mouskou Street to the right (the junction of which with Ion Street is proposed as a mini-roundabout) and the access to Grivas Digenis Avenue just after the kerb build-out to the left. Existing features to note are:

- Irregular carriageway widths
- Informal and designated parking
- Commercial frontages and building access
- Several adjoining streets.

2.8 Section 6 – drawing no: 171512-OS-002/06

General issues

2.8.2 The principal issue in this section is how to deal with the large junction where the traffic streams of Museum Street, Nechrou Avenue, Homer Street, Byron Avenue, Gladstone Street, and Chelon Street all converge.

2.8.3 Gladstone Street itself is a quiet residential street but has one-way sections.

Route options

2.8.4 The route alignment follows Gladstone Street, Nechrou Street, Museum Street, and Homer Street. A route along Chelon Street is identified for a future phase of the cycle network.

Design options

2.8.5 As Gladstone Street is a quiet residential street, general traffic calming measures would be the most appropriate design solution and hence minimal physical measures will be required. A contraflow cycle lane is required for the one-way southbound section (from Michael G Parides Street until the entrance to the Pedieios River). There is a possibility of the upper section (Michael G Parides Street to Museum Street junction) being pedestrianised. Using minimal measures as proposed would obviate the need for costly re-design should this be implemented.

2.8.6 There is also a long-term proposal to pedestrianise Museum Street. Designs for pedestrianisation should incorporate cyclist access, the layout of which can be in keeping with the overall design of the pedestrianisation scheme. It should ensure that any cycle facility connects with cycle routes at the junctions at the north and south. The design shown in the drawing (171512-OS-002/06) with a shared-use pathway on the western side of Museum Street is therefore an interim solution.

Commentary on proposals

2.8.7 A contraflow lane is proposed for the section of Gladstone Street from the Pedieios River access road to Michael G Parides Street. An advisory cycle lane is proposed to allow access to properties. This will also have a traffic calming effect by narrowing the effective carriageway width whilst still allowing flexibility in the use of road space if required. Being a quiet residential street any manoeuvres cyclists may need to make that deviates from the contraflow lane should be reasonably safe.

Figure 2.13: 'Teardrop' island

2.8.8 Figure 2.13 shows a possible design feature for the Gladstone Street section - a 'teardrop' island that allows overrun for larger vehicles. This has the advantage of physical demarcation at critical points whilst being flexible enough to allow overrun if required. This example is used on a cycle route in London to protect a contraflow cycle lane at a bend in the road in a residential area, with an adjoining cycle route at this point. This situation is very similar to the corner on Gladstone Street where the access road joins the Pedieos River, but in reverse.

2.8.9 At Museum Street the proposed design shows shared-use for pedestrians and cyclists on the western path. This is a short to medium term design until such time as Museum Street itself is pededstrianised, as proposed in the IMMP.

2.8.10 The proposed design for the Museum Street junction aims to simplify the junction where possible to reduce the number of stages and the crossing distance for pedestrians and cyclists. The splitter island at the junction mouth of Byron Avenue (existing and proposed) provides no discernible benefit in terms of traffic management. The northbound carriageway width at the junction has also been reduced.

2.8.11 Nechrou Street and Homer Street are both one way westbound. Nechrou Street is a very wide highway at between 10 to 15 metres including footways and carriageway. There is more than adequate physical space for a two-way cycle track along the southern side although existing parking bays may have to be modified. The carriageway of Nechrou Street is approximately 5 to 6 metres wide and the most suitable design here is an undemarcated shared-use path with two-way cycling on the pavement on the southern side, which is approximately 3.0 metres wide. Footfall on both Nechrou Street and Homer Street is low as neither has any active frontages, except for the very eastern end of Homer Street where it joins Lloyd George Place and where there is informal parking on the footway.

2.8.12 At Egypt Street a shared-use footpath on the eastern side is proposed as the adjacent carriageway is comprised of three lanes one-way southbound with the possibility of one

of them being a bus lane (as proposed in the IMMP). Footfall is low and there are minimal frontage access requirements – one entrance to a tennis club and a car park.

2.8.13 At Stasinos Avenue it was agreed with the PMU that designs would be compatible with the aspiration for a two-way cycle track along the two-way sections of highway (presently with four lanes) along the perimeter of the old city. This was to be achieved by converting the innermost (northern) lane into a two-way cycle track, with one lane each way for general traffic, utilising the remaining middle lane for alternate right-turn pockets and hatching.

2.9 Section 7 – drawing no: 171512-OS-002/07

General issues

2.9.2 The main issue in this section is the roundabout at the junction of Museum Street, Cinyras Street, Markos Drakos Avenue, Paphos Street, and Egypt Street, and possible linkages with existing cycle provision.

Route options

2.9.3 Consideration of cycle facilities on a short section of Heroon Street, along with Charalambos G Mouskos Street and Markos Drakos Avenue, was requested by the Mayor of Nicosia at a meeting on 8 July 2010. Heroon Street was added to the network as it links with an existing cycle route along Eleftheriou Venizelou. In addition, it is also recommended that Cinyras Street be considered as part of the network as it forms a direct link from Heroon Street and the Agios Demetios area generally to the city centre.

2.9.4 Cinyras Street is three lanes one-way eastbound. It has not been identified by the PMU team as part of the First Priority Cycling Network but it is recommended that it should be included in a future stage of cycle provision. This is because it provides a more direct link from the west to the city centre, especially as Heroon Street has been identified as a link in the cycle network and joins Cinyras Street to the west, and the rest of the network is linked to Cinyras Street in the east at the roundabout by Museum Street. A two-way cycle track on the south side of the highway should be considered with a built out footway and cycle track.

Design options

2.9.5 Future design proposals for the roundabout at the north end of Museum Street need to be confirmed. Since Museum Street itself is to be pedestrianised, there may be the possibility of re-modelling this junction as a four-arm crossroads instead of a roundabout. This would improve conditions for cyclists as the existing roundabout is large (at approximately 16 metres diameter) which means circulatory traffic can travel at high speeds relative to cyclists.

Figure 2.14: Roundabout at Museum Street – vehicle movements

Image source: Microsoft Bing Maps

2.9.6 Figure 2.14 shows a satellite image of the roundabout at the north end of Museum Street. The darkened areas of the carriageway shows the main vehicle movement through the circulatory carriageway due to tyre marks, showing that vehicles tend to use significantly less of the carriageway than is presently provided. The image suggests that vehicles entering Museum Street and Paphos Street tend to approach these streets as a single lane whereas they tend to approach Egypt Street as if in two lanes.

Figure 2.15: Roundabout at Museum Street – cycle movements

2.9.7 Figure 2.15 shows the roundabout at the north end of Museum Street at street level (facing Paphos Street) with a cyclist using the junction, showing the extensive carriageway space. There is much scope to either (i) introduce circulatory lane markings to control vehicle movements, (ii) reduce the present carriageway by building out the footway, (iii) introduce a peripheral cycle lane (on carriageway or footway level), or else (iv) re-model the junction as a four-arm crossroads, depending on pedestrianisation options for Museum Street itself.

Commentary on proposals

2.9.8 The brief sought design options for the roundabout and a conclusion as to whether to provide for cyclists on the roundabout itself.

2.9.9 Given the long-term aspiration to pedestrianise Museum Street, and given that the rest of the First Priority Cycling Network will either be segregated cycle tracks or traffic-calmed quieter roads, it would be consistent with the rest of the network to provide for cyclists off-carriageway with a crossing south of the roundabout, as the short to medium term measure. However, treatment should also be provided on the circulatory carriageway to control vehicle movements as they circulate around the roundabout. This is a general measure to control traffic and also help cyclists who are not using the First Priority cycle route and who would still use the roundabout.

2.9.10 In order to link the First Priority Cycling Network with the existing route on Eleftheriou Venizelou Street, a short section of the footway on Heroon Street from Parthenon Street to the junction with Louki Akrita Avenue should be made shared-use for pedestrians and cyclists. There may be an opportunity to acquire some land in order to widen the pathway, especially at the corner by the crossing. Footfall is quite low in this section. There is existing signage on Parthenon Street indicating a cycle route but the actual path cyclists should take through the one-way section is unclear.

Figure 2.16: Heroon Street – footpath and adjacent land

2.9.11 Figure 2.16 shows the potential to widen the path on Heroon Street between Parthenon Street and the junction with Louki Akrita Avenue. The ownership of the verge between the path and the building has not been established.

2.9.12 At Charalambos G Mouskos Street it is proposed that cyclists re-join the carriageway just north of the junction with Cinyras Street; a suitable location may be just after the parking in front of the law courts. This is a very quiet street and will not require much in the way of physical cycle facilities or traffic calming. In any case, this street is located near the present UN border control and there is unlikely to be much demand for this route.

2.9.13 At Markos Drakos Avenue the section of carriageway from the present UN border control to the roundabout at Museum Street is being re-built with a new combined footway and cycle track. The drawings show how a crossing at the junction with Paphos Street would link this new facility with the rest of the First Priority Cycling Network.

Appendix 1

Technical Note: Comments on Archangelou Junction

20 Eastbourne Terrace
London
W2 6LG
T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

Technical Note

Job Title	Nicosia PT Enhancement Programme		
Job Number	17151-02-1	**Date**	09/08/2010
Circulation copy	- Michael Lambrinos (MCW) - Dinos Kathijotis (MCW) - Willem Brouwer (MCW) - Aristotelis Savva (MCW) - Demos Demosthenous (MCW) - Anna Caramondani (ALA Planning) - Andreas Markides (CB)	**File reference**	3.1 Reports version d6 Drawing no: 171512-OS-003
Prepared by	Philip Loy (CB)	**Reviewed by**	- Rob Goldup (CB) - Dennis Pederick (CB) - Sam Carson (CB)
Subject	**Cycling Network - comments on Archangelou junction**		

1 Introduction

1.1 Colin Buchanan (CB) is preparing preliminary designs for the First Priority Cycle Network for Nicosia, which was part of the recommendations of the Nicosia Integrated Mobility Masterplan. Proposals and recommended designs for the cycle network will be affected in some locations by the planned provision for cyclists within current highway improvement schemes. Archangelou junction is one such location and here the road improvement works are already underway. This note recommends some modifications to the design of the cycle track adjacent to the footway that is part of the Archangelou scheme, and was requested by the PMU team (Ministry of Communications and Works) in a meeting on 16th July 2010.

1.2 It is the aspiration of the PMU to implement a segregated cycle track as part of the First Priority Cycle Route on Grivas Degeni, from the campus site of the University of Nicosia through to the pedestrian/ cycle track that forms the northern boundary of the Kykkos Monastery linking Agios Prokopiou to Ionos. For most of the route alignment along Grivas Digeni this is most likely to be a two-way cycle track utilising the space within adjacent verges along the highway, east of the junction with Grigori Afxentiou. However, the Archangelou highway scheme that is currently under construction proposes one way cycle tracks either side of the main carriageway to the design as shown in Figure 1.

1.3 This note outlines some issues that can arise with the current design proposal for Archangelou junction with respect to the cycle facilities. The comments in this note are to be read in conjunction with Drawing no. **171512-OS-003**.

2 The current design for the Archangelou scheme

2.1 Works are underway around the junction of Archangelou, Grivas Degeni, and Agios Prokopiou and much of the carriageway and footway is being rebuilt. Some sections of cycle track adjacent the footway have already been completed in the upper section of Agios Prokopiou, towards the junction with Metochiou (see Figure 1).

2.2 Figure 1 shows the present design being used for the new sections of pavement. Features to note are as follows:

- The tactile surfaces on the footway
- The width of the cycle track is no greater than 1.0 metre
- The total width of footway/ cycle path combined no greater than 3.0 metres
- Materials used for the two sections are different – paving slabs are used for the footway and tarmac/ blacktop for the cycle track

- The cycle track is laid slightly lower than the footway at approximately 5 to 10 millimetres below the surface of the adjacent paving slabs.

Figure 1: New pavement laid as part of Archangelou works incorporating cycle track (Agios Prokopiou looking north)

3 Issues

Limited Accessibility

3.1 There are two issues that arise from these current proposals for cycle facilities within the Archangelou scheme. The more important point is the limited accessibility that results from providing one-way cycle paths on each side of the highway. Use of these cycle paths as 'designated' would involve cyclists making multiple stage crossings at the main junction with Grivas Digeni (see Path 'A' in Drawing no. 171512-OS-003). If the crossings at the main junction at Grivas Digeni are to be two-stage, this will entail an eight-stage crossing for the whole route section (indicated in the drawing as Path 'A'). In practice cyclists are unlikely to follow this path as it is more practical to use the pedestrian crossing just to the north of the junction, which will be shorter and quicker (see Path 'B' in Drawing no. 171512-OS-003).

3.2 Since this is likely to be the case, the design of the pathway for pedestrians and cyclists should take this into account by accommodating two-way cycling. Ideally this should be on both sides of the highway, but at the very least on the section that forms the First Priority Cycle Network.

Path Design Detail

3.3 Since it is likely that cyclists will use the pathway in both directions, the cycle track design shown in Figure 1 is not suitable for the following reasons:

- At less than 1.0 metre, the track is too narrow for two-way cycling and cyclists will inevitably use the footway area
- The slight discrepancy or 'upstand' of 5 to 10 mm between footway and cycle path can pose a trip hazard for both pedestrians and bicycles with narrower tyres.

Enforcement

3.4 The PMU is currently seeking advice on drafting a legal code for cyclists. The status of cycling two-way on shared-use paths designated as one-way is yet to be established, but it should be noted that enforcement of such designations is unlikely to be a priority should it ever come into force.

4 Opportunities

4.1 Under current proposals for Grivas Digeni, right turns (westbound) will not be permitted into Iakovou Patatsou and Grigori Afxentiou. This is to be enforced with a central island reservation running from approximately 120 metres west of the Agios Prokopiou junction and continuing along Grivas Digeni up to the main Archengelou junction with Agios Prokopiou (as shown in Drawing no. 171512-OS-003). In the section between Iakovou Patatsou and Grigori Afxentiou, current designs for the central island propose approximate widths of between 2.0 and 4.0 metres. This is redundant carriageway space which could be given over to footway space to improve the adjacent pedestrian and cycle facilities (see Proposal No. 3).

4.2 A car park is proposed for the area between Iakovou Patatsou and Agios Prokopiou, opposite the Kykkos Monastery. It is understood that in proposed designs there will be space between the car park area and the highway that will be landscaped verges, retaining some existing trees. This space can potentially be utilised to improve pedestrian and cycle facilities (see Proposal No. 4).

4.3 On Agios Prokopiou, the highway is being widened by incorporating a service road as part of the main carriageway. Current proposals feature a wide central island reservation of between 9.0 and 13.0 metres at its widest point, which again is redundant carriageway space which could be given over to footway space to improve the adjacent pedestrian and cycle facilities (see Proposal No. 8).

5 Proposals

5.1 Two-way cycling is recommended for all the paved footways adjoining the main junction at Archangelou. At the very least, the section of highway that forms part of the First Priority Cycle Route should be two-way, but note that this includes connection to the campus site of the European University to the south of the main junction at Grivas Digeni.

5.2 It is also recommended that there is no demarcation of separate pedestrian and cycle paths on the pavement, or at the very least another form of demarcation is used that does not use surface level differentiation. Anticipated levels of walking and cycling make such a design approach appropriate for this location, which also has these advantages:

- An undemarcated path automatically gives priority to pedestrians because there is no sense of ‘ownership’ that demarcation can give rise to in shared-use situations and should keep cycle speeds lower
- Given the likely volumes of both pedestrians and cyclists, an undemarcated path gives the full width of the pavement for sideways movement by either pedestrian or cyclist, and allows users to avoid each other as necessary.

5.3 It should be noted that if at some future date levels of either pedestrians or cyclists increase significantly, the design of the footway may need to be reviewed. It should also be noted however that much of the footway being rebuilt in the Archangelou scheme is to a design width of 3.0 metres, which might not provide scope for an increase in capacity should this ever be required in future. Proposals Nos 3, 4, and 8 aim to maximise the width of the pathway that will form part of the First Priority Cycle Network alignment whilst there is opportunity to do so.

5.4 Signage will be important to indicate the best routes for cyclists, especially where different path designs are used for certain sections of highway. Recommendations for signage design will be addressed in the main report for the preliminary designs of the First Priority Cycle Network.

5.5 **Proposal No. 1:** Design for two-way cycling on both sides of the highway, especially for the section that is part of the First Priority Cycle Network - along Grivas Digeni from the Grigori Afxentiou junction, through the Archangelou junction, and along Agios Prokopiou up to the point at which it meets the two-way pedestrian and cycle pathway that forms the northern boundary of the Kykkos Monastery gardens (see Drawing no. 171512-OS-003).

Reason: Two-way cycling is recommended in order to maximise the accessibility for cyclists on a busy stretch of dual carriageway where opportunities for crossing will be limited due to the central barriers in the carriageway and the speed and volume of traffic.

Note: The priority for facilitating two-way cycling is on the section of highway that forms the First Priority Cycle Network. Ideally however, two-way cycling should be facilitated on both sides of the highway in this area where accessibility and crossing points are reduced due to the volumes and speeds of traffic and to facilitate all local walking and cycling trips. This will also make the cycle facilities more consistent. Note also the requirement to connect the European University campus site which would require facilitation of two-way cycling on all approaches to the main Archangelou junction.

5.6 **Proposal No. 2:** Design the pathway without any physical demarcation between pedestrians and cyclists, providing a flat surface across the full width of the pathway.

Reason: This will maximise the space for sideways movement on the pathway for pedestrians and cyclists, allowing them to avoid each other at any particular point.

Note: If some form of demarcation is deemed necessary it should be implemented with surface markings or other form of differentiation on the surface rather than a physical measure. Also, use of different materials as shown in Figure 1 is likely to incur higher maintenance costs than using the same material for the whole path surface.

Further, if the tactile paving is required as shown in Figure 1, this can still be installed to one side of the pathway without detriment to its function as a wayfinder.

5.7 **Proposal No. 3:** Modify the proposed central carriageway island on Grivas Digeni by narrowing the island to permit widening of the parallel footway, allowing a footway width of 6.0 metres between Iakovou Patatsou and Grigori Afxentiou.

Reason: This will maximise the width of the shared-use pathway and provide improved conditions for path users, especially along a very busy and noisy traffic corridor and where there is likely to be increased frontage requirements where local shops are located.

Note: A wider path is proposed for the section between Iakovou Patatsou and Grigori Afxentiou to accommodate the potential for increased footfall due to the local shops (see Figure 2). Under current proposals, the footpath on the eastern side of Grigori Afxentiou junction will be 6.0 metres but will taper down to possibly less than 3.0 metres at the junction with Iakovou Patatsou (to accommodate three general traffic lanes on the main carriageway). Less than 3.0 metres is not advisable for shared-use paths.

5.8 **Proposal No. 4:** Utilise the space between the proposed car park (opposite the Kykkos Monastery) and the highway so that it is used for pedestrians and cyclists. In current proposals for the Archangelou scheme, the combined width from the kerb line to the line of existing trees should allow a pathway width of at least 5.0 metres effective width for the full length of the path up the crossing on Agios Prokopiou.

Reason: This will maximise the width of the pathway and provide improved conditions for path users, especially along a very busy and noisy traffic corridor.

Note: Current proposals for the layout of the car park opposite the Kykkos Monastery aim to retain existing trees along the southern boundary along Grivas Digeni and introduce a new landscaped verge along the eastern boundary with Agios Prokopiou (up to the vehicle entrance). Where existing trees are retained, the effective path width should take into account any space taken up by tree bases, which may require removal of some trees. The landscaping parallel to Agios Prokopiou should be narrowed so as to allow a wider pathway for pedestrians and cyclists. This design proposal will improve conditions for pedestrians and cyclists without having to reduce the capacity of the car park.

Proposal Nos 3 and 4: For shared-use pathways for pedestrians and cyclists 3.0 metres is used as a recommended minimum design width in the UK and Denmark. This is

however a minimum width and opportunities to widen the pathway should be pursued as (i) it improves the facility for the user and (ii) it takes into account future growth. The path width in Proposal No. 4 need not be as wide as in Proposal No. 3 as there is no frontage that would generate an increase in footfall in the immediate area.

5.9 **Proposal No. 5:** Provide junction treatments along Grivas Digeni at the junctions with Grigori Afxentiou and Iakovou Patatsou, and along Agios Prokopiou at the entrance to the proposed car parking site. Treatments can be one or all of the following:

- Raised table at the junction
- Carriageway markings with surface treatment highlighting the pedestrian/ cycle pathway to motorists entering or leaving the junctions
- Signage on approach to the junction warning motorists of the crossing.

Reason: These measures aim to improve safety and improve the general environment for pedestrians and cyclists along a busy traffic corridor. The minor streets in question are not heavily trafficked whilst Grivas Digeni is a busy traffic corridor. Providing traffic calming measures should have no discernible effect on traffic flows whilst providing a safer environment where needed.

Note: The raised tables should extend back for 1.0 to 2.0 metres to allow slowing distance for vehicles on approach to the crossing itself. At Iakovou Patatsou and Grigori Afxentiou they would extend into the side street; at the entrance to the car park on Agios Prokopiou they would extend in the direction vehicles enter the access/ slip road.

Where there is a vehicle entrance which is not a street junction (such as entrances to properties or buildings), consideration should also be given to similar treatments.

5.10 **Proposal No. 6:** Ensure that the signalised and zebra crossings on Agios Prokopiou (by the car park entrance) caters for cyclists as well as pedestrians. Ensure particularly:

- Adequate widths for both pedestrians and cyclists, especially on central island; crossing paths can be widened up to 4.0 to 5.0 metres
- That signals conform to relevant regulations to allow cyclists to cross
- That dropped kerbs etc are installed and are wide enough to match the width of the crossing path (4.0 to 5.0 metres)
- That there is signage on approach to the crossing to indicate the main cycle route.

Reason: This will facilitate Path 'B' as highlighted in Drawing no. 171512-OS-003.

Note: In current proposals the central refuge is approximately 4.0 metres at the narrowest point and 10.0 metres in length which should be sufficient for anticipated levels of use. The widening of the zebra crossing across the slip at the entrance to the car park is not as physically restricted.

5.11 **Proposal No. 7:** For the cycle track to the west of Grigori Afxentiou junction, investigate the acquisition of land as pictured in **Figure 3** to provide a wider two-way cycle track.

Reason: The path types either side of the Grigori Afxentiou junction will be different due to the varying conditions and requirements in each section. The western side will have a two-way cycle track with separate footway, whereas the eastern side will be a shared-use path. The junction will therefore be a transition between the two facility types. Even if there is a separate footway on the western side, inevitably there will be crossover of cyclists and pedestrians. The wider pathway will compensate for this possibility.

Note: See photographs below illustrating potential path alignments. In **Figure 2**, the proposed crossing will be a transition from a two-way cycle track and footway to a shared-use path. In **Figure 3**, width options are shown, which may require negotiation with landowners to acquire extra land. It is recommended that this is pursued to provide a wider cycle track.

Figure 2: Junction at Grigori Afxentiou (looking east)

- The foreground is the potential area for a two-way cycle track
- The existing footway is outside the trees, where the barriers are located

Figure 3: Grivas Digeni alongside Andrea Chaliou Street car park (looking west)

- Width A is the existing grass verge
- Width B is up to the second kerb line – ownership of this section of land to be established
- Width C is up to the third kerb line – ownership of this section of land to be established

5.12 **Proposal No. 8:** Modify the proposed central carriageway island on Agios Prokopiou by narrowing the island to permit widening of the parallel footway, allowing a footway width of 5.0 metres between the signalised crossing and two-way pedestrian and cycle pathway that forms the northern boundary of the Kykkos Monastery gardens.

Reason: This will maximise the width of the shared-use pathway and provide improved conditions for path users, especially along a busy and noisy traffic corridor.

Note: At the southernmost signalised crossing there is a trade-off between the width of the central island which acts as a refuge in the centre of the carriageway and the width of the pathway by the Kykkos Monastery building. This is only a small section however and should not pose significant issues with crowding given anticipated levels of use.

There is also the option to re-allocate the space taken up by the central carriageway island north of this point, from the Palingenesias side road junction to the main junction with Metochiou. This will depend on the stage at which the scheme has progressed for this section but need not be a priority as it has not been identified as part of the First Priority Cycle Network. In the drawing (171512-OS-003) the new alignment has been shown up to the northernmost signalised crossing.

6 Example Designs

6.1 Figure 2 shows an example of an undemarcated cycle facility near Agia Napa; i.e. it does not distinguish between a pedestrian space and a cyclist space. This design is best where both pedestrian and cyclist levels are quite low.

Figure 4: Shared-use cycle facility near Agia Napa

6.2 Figure 3 shows an example from Agios Demetios where the cyclist and pedestrian space is indicated with different surface textures but otherwise (apart from the shallow rain gulley) there is no strict physical demarcation.

Figure 5: Shared-use facility in Agios Demetios

SCALE 1:1000@A2

Provide raised table where pedestrians and cyclists will cross (see proposal No.5)

Proposed width including verge is 5.0 metres approx

A width of 5.0m along Gravis Digenis would improve conditions for path users (see Proposal No.4)

Proposed alignment for cycle route west to University of Nicosia campus

Proposal No.7
Investigate acquisition of land to provide wider two-way cycle path

Proposal No.5
Junction treatment to improve safety on cycle route

Proposal No.3
Reallocate highway width from central reservation to facilitate 6.0m wide path

Proposal No.4
Area that can be utilised for wider pedestrian and cycling facilities. Ensure at least 5.0m width for pedestrian / cyclist pathway

Path A
Using this route involves six, possibly eight, stages of crossings at junctions (Ref: Section 3.1 of Technical Note)

Path B
Using this route involves two stages of crossings

Proposal No.8
Reallocate highway width from central reservation to facilitate 5.0m width path

Proposal No.6
Widen signalised crossing facilities and zebra crossing for both cyclists and pedestrians, up to 4.0 to 5.0m, and signage required to indicate route.

Proposed alignment of cycle route east to old city

KYKKOS MONASTERY

COSTIS PALAMAS ST.

ANDREA CHALIOU STR.

GRIVAS DIGENIS AVENUE

GRIGORI AFXENTIOU STR.

IAKOVOU PATATSOU STREET

PROKOPIOS STREET

PALAIOGENESIAS ST.

KEY

Path A

Cycle route from East to West if using originally proposed route alignment as one-way route

Path B

Most likely route cyclists will take in both directions - this section to be two-way (Proposal No.1)

Proposed road markings

Proposed footway construction

Proposed island reduction

Proposed raised table crossing

NOTE: PLEASE REFER TO ACCOMPANYING TECHNICAL NOTE FOR MORE DETAIL

Drawing Title

COMMENTS ON ARCHANGELOU JUNCTION

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

COLIN BUCHANAN

Scale:	1:1250@A2
Designed by:	PL
Drawn by:	AM
Chkd/App:	PL
First Issued:	AUG '10
Job No:	17151-02-1

Rev	Date	Amendment	Des.	Drn.

Drg No: 171512-OS-003

Rev

I:\17151-02-X_Nicosia PT Enhancement - Cycling Network\3. Project\3.3 Graphics\3.3.2 CAD\171512-OS-003.dwg

Appendix 2

Technical Note: Prodromou scheme options

20 Eastbourne Terrace
London
W2 6LG
T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

Technical Note

Job Title	Nicosia PT Enhancement Programme		
Job Number	17151-02-1	**Date**	02/09/2010
Circulation	- Michael Lambrinos (MCW) - Dinos Kathijotis (MCW) - Willem Brouwer (MCW) - Aristotelis Savva (MCW) - Demos Demosthenous (MCW) - Anna Caramondani (ALA Planning)	**File reference**	Drawings: 171512-OS-004.dwg 171512-OS-005.dwg 171512-OS-006.dwg 171512-OS-007.dwg
Prepared by	Philip Loy (CB)	**Reviewed by**	- Rob Goldup (CB) - Dennis Pederick (CB)
Subject	**Prodromou scheme options (DRAFT for comment)**		

1 Introduction

1.1 Colin Buchanan (CB) is preparing preliminary designs for the First Priority Cycle Network for Nicosia, which was part of the recommendations of the Nicosia Integrated Mobility Masterplan. Proposals and recommended designs for the cycle network will be affected in some locations by current highway improvement schemes. The northern section of Prodromou is one such location where a contract for highway improvement works has been awarded.

1.2 The PMU team has identified four options to facilitate the First Priority Cycle Network through this section. CB has developed those four options into designs to identify the infrastructure requirements associated with each, and the revisions to the planned works at Prodromou required by each. This note, to be read with the accompanying drawings (**171512-OS-004** to **171512-OS-007),** outlines the four options and provides a comparative assessment of them.

1.3 The PMU team has highlighted the possibility that the section of Ionos from Prodromou to Konstantinou Paleologou could become one-way, with Kanari providing for flow in the opposite direction, or it could be closed completely to general traffic. Neither proposal would fundamentally affect the designs described below.

1.4 In all the designs discussed below, where sections of shared-use (pedestrians and cyclists) paths are proposed, it is recommended that no physical separation is used. If demarcation is required this can be achieved using markings or surface texture differentiation. This can be accompanied and reinforced with signage indicating shared-use with pedestrian priority.

1.5 It should be noted that the designs have not been tested in terms of their effects on traffic flows or general traffic capacity.

2 Options (a) to (c) – common design features

2.1 In options (a), (b) and (c), west of Prodromou the cycle route will follow Ionos Nikolaous and Ionos. East of Prodromou it will follow Herodotou.

2.2 On these sections cyclists will be on the carriageway with general traffic. These are, however, mostly much quieter residential roads than the busy Prodromou.

2.3 The contraflow provision for cyclists on Ionos Nikolaous (which is one way westbound) is proposed to consist of two islands and an advisory cycle lane to allow access to frontages. This has the disadvantage that parked vehicles are able to park on the carriageway and block the contraflow path. This can be mitigated by existing parking restrictions being extended along the whole section of the contraflow and enforced. However, this section is also a quiet residential street and quite wide, and cyclists should be able to negotiate parked vehicles reasonably safely.

2.4 The part of the route on Ionos is characterised by on street parking, loading/unloading, and side road junctions. A number of features are, however, incorporated in the option designs to mitigate the adverse impacts on cyclists of these route characteristics and to manage traffic speeds. These include:

- A mini-roundabout at the junction with Chr. Mouskou
- Speed humps or tables where traffic enters Ionos from Grivas Digeni and on Ionos itself
- Carriageway markings on side roads approaching Ionos alerting motorists to the presence of cyclists

2.5 The provision for cyclists on Prodromou itself under options (a) to (c) is discussed in Sections 3 to 5 below.

3 Option (a): 171512-OS-004

3.1 This option provides for a combined footway and one-way cycle track on either side of Prodromou. Crossing points at the Ionos/Prodromou and Herodotou/Prodromou junctions are required. The shared-use path will be slightly below the target width of 3.0 metres but this would be mitigated by the two streams of cyclist traffic being on separate sides of the road whilst general volumes of both cycling and footfall are likely to be quite low for the foreseeable future.

3.2 At Prodromou/Ionos the cycle route design utilises existing design features to facilitate the crossing for eastbound cyclists, namely the splitter island and a left-turn slip lane (northbound) at the Ionos entry.

3.3 Significant additional design features proposed at Prodromou are:

- A raised table at the M. Georgalla Street entry to the junction
- A refuge island on Prodromou to afford some protection for cyclists waiting to cross northbound - the target width for the refuge island is 2.0 metres, subject to the available carriageway width

3.4 At Heredotou westbound cyclists will cross the southern arm under signal control utilising the planned crossing. On Herodotou itself cyclists will rejoin the carriageway.

3.5 The **advantage** of this option is that it involves minimal alteration to the current Prodromou designs.

3.6 The principal **disadvantage** is that the right-turn for eastbound cyclists at Ionos is designed to be undertaken in three stages - two across Prodromou and one across M. Georgalla Street. There may be some safety issues to consider in manoeuvring close to the junction but these are mitigated by:

- The lower traffic speeds and volumes involved as M. Georgalla Street is an access road for the hospital and private residences
- The proposed give way markings located on M. Georgalla Street in advance of the junction
- Good visibility for all road users
- The raised table

3.7 As noted earlier Ionos itself does not present an ideal environment for cyclists although, again, mitigation measures are incorporated in the route design.

4 Option (b): 171512-OS-005

4.1 This option differs from Option (a) in that on Prodromou cyclists are provided for by a two-way shared-use path on the south side of the carriageway.

4.2 Significant additional design features proposed on Prodromou are:

- An increase in the footway width of the south east corner of the Herodotou junction
- Removal of the splitter island and left-turn slip lane (northbound) at the Herodotou junction

4.3 This option has the **advantage** over Option (a) in that route for cyclists is less convoluted and involves only a single, and a more direct, crossing of Prodromou.

4.4 Its **disadvantages** are that:

- It requires alterations to the carriageway and footway widths at the Herodotou junction, including the removal of the left-turn slip lane
- The removal of the left-turn slip lane may affect traffic flows on Prodromou, although this may be mitigated by signal timings

5 Option (c): 171512-OS-006

5.1 With Option (c) instead of following Prodromou between Ionos and Herodotou, the cycle route crosses Prodromou from Ionos and follows M. Georgalla Street, turning right through a passage to be created (with land acquisition) between two empty plots, then turning left into Herodotou.

5.2 A mini roundabout to facilitate the crossing of Prodromou from/into Ionos is the only significant additional design feature proposed for Prodromou.

5.3 The mini-roundabout, instead of traffic signals, at the junction with Herodotou shown on drawing 171512-OS-06 is presented as a further design option but is not an essential part of the design. Complementary mini-roundabouts could help reinforce their effectiveness as a traffic management feature rather than having two different designs in such close proximity. However, traffic signals can provide for controlled pedestrian/cycle crossings.

5.4 The **advantage** of this option over (a) or (b) is that the crossing of Prodromou for cyclists is simpler, and made safer with use of a mini-roundabout.

5.5 However, the principal **disadvantages** are that it involves significant alterations to the existing design for Prodromou, and requires land acquisition.

6 Option (d): 171512-OS-007

6.1 Option (d) differs from the other three in that the cycle route follows Vassili Michaelide and Sina Street instead of Ionos. On Vassili Michaelide cyclists will be on the carriageway while on Sina a two-way cycle path would be provided on north side within the existing footway width of 4 metres. The route then turns left into Prodromou and right just after the church to link with a spur for the Pedeios river route until reaching Gladstonos.

6.2 Significant new design features include mini-roundabouts at the junction of Sina and Vassili Michaelide.

6.3 The main **advantages** of this option over the other three are that:

- Vassili Michaelide presents a more pleasant cycling environment than Ionos
- It requires no changes to existing designs for Prodromou
- It utilises the wide footway on the northern side of Sina

6.4 A **disadvantage** of this option is that the footway on Prodromou outside the church is not wide enough to achieve the target width for a shared use path - however, this is a relatively short length of path and average pedestrian footfall is likely to be relatively low.

7 Comparison of options

7.1 There are a number of issues involved in identifying the preferred option, which can only really be evaluated in discussion with PMU. These include the feasibility and cost of incorporating design changes into the Prodromou works for which a contract has already been awarded, and the feasibility and cost of land acquisition for Option (c).

7.2 The following are some comments on Options (a) to (c):

- Option (a) involves a new raised table with associated extra costs
- Option (b) involves changes to signalling arrangement
- Option (c) involves major changes of the existing design, and requires land acquisition, but provides a direct route.

7.3 Option (c) would be the preferred of these three options, based on cycling considerations alone.

7.4 Option (d) provides a direct route without any major changes to the current design for Prodromou itself. It is a slightly longer route, but one with a better 'ambience' for cyclists (see Table 7.1).

Table 7.1: Route Options

Route Option	Distance	Directness/ Convenience	Safety/ Ambience
Option (a)	900 metres approx.	Good	Fair
Option (b)	900 metres approx.	Good	Fair
Option (c)	900 metres approx.	Good	Good
Option (d)	920 metres approx.	Good	Very good

7.5 In terms of the provision made for cycling, therefore, Options (c) and (d) are preferred over (a) and (b), due to their directness and simpler (and therefore inherently safer) crossing arrangements for Prodromou which is a busy traffic corridor, with (d) being the preferred over (c) in terms of route ambience.

7.6 On balance, Option (d) would be the preferred option on the basis of cycling considerations alone.

SCALE 1:500@A2

"Give Way" signage

Markings indicating pedestrian / cycle route

3m

3m

Markings indicating pedestrian / cycle route

"Give Way" signage

"Give Way" signage

"Give Way" signage

Install carriageway marking with coloured surfacing to highlight cycle route for motorists exiting side roads. (see note for explanation)

7.0m

Install domed mini roundabout with over-run area, diameter 7.0m with associated lane markings to emphasise new junction layout.

Facilitate two-way for cyclists on one-way street. Use build-outs at each end of the road with advisory lane marking (options a, b & c only). Width of cycle lane to be 1.50m minimum.

Install speed hump or table

Kerb build-outs to prevent parked vehicles blocking entrance to path. (2m from carriageway edge)

Signage indicating two-way for cyclists eg. UK

Install speed hump for entry into Ionos from Grivas Digenis and incorporate into existing splitter island.

KEY

Path of cyclists through junction

SCALE 1:1000@A2

DRAFT FOR COMMENTS ONLY

Drawing Title

COMMENTS ON PRODROMOU STREET SCHEME
OPTION (c)

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

COLIN BUCHANAN

Scale:	1:1250@A2
Designed by:	PL
Drawn by:	AM
Chkd/App:	PL
First Issued:	AUG '10
Job No:	17151-02-1

Rev	Date	Amendment	Des.	Drn.

Drg No: 171512-OS-006

Rev

I:\17151-02-X_Nicosia PT Enhancement - Cycling Network\3. Project\3.3 Graphics\3.3.2 CAD\171512-OS-006.dwg

SCALE 1:500@A2

KEY
- Shared use pavement
- Path of cyclists through junction
- Dropped kerbs

Use of coloured surfacing to act as traffic calming.

Incorporate pedestrian / cyclist phase into signal sequence to allow access to Herodotou - cyclists both northbound & southbound re-join carriageway at this point. Crossing in both directions to be simultaneous. (ie. green for cyclists / pedestrians on pavement on corner is simultaneous with green for traffic exiting Herodotou southbound)

Advance stop line for cycle waiting area

Install carriageway marking with coloured surfacing to highlight cycle route for motorists exiting side roads. (see note for explanation)

7.0m

Install domed mini roundabout with over-run area, diameter 7.0m with associated lane markings to emphasise new junction layout.

Facilitate two-way for cyclists on one-way street. Use build-outs at each end of the road with advisory lane marking (options a, b & c only). Width of cycle lane to be 1.50m minimum.

Install speed hump or table

Kerb build-outs to prevent parked vehicles blocking entrance to path. (2m from carriageway edge)

Signage indicating two-way for cyclists eg. UK

Install speed hump for entry into Ionos from Grivas Digenis and incorporate into existing splitter island.

Drawing Title

COMMENTS ON PRODROMOU STREET SCHEME
OPTION (b)

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

COLIN BUCHANAN

Scale:	1:1250@A2
Designed by:	PL
Drawn by:	AM
Chkd/App:	PL
First Issued:	AUG '10
Job No:	17151-02-1

Rev	Date	Amendment	Des.	Drn.

Drg No: 171512-OS-005

Rev

I:\17151-02-X_Nicosia PT Enhancement - Cycling Network\3. Project\3.3 Graphics\3.3.2 CAD\171512-OS-005.dwg

SCALE 1:500@A2

Give Way on carriageway on approach to junction

Warning sign to drivers of cyclists turning.

Junction treatment to allow cyclists to turn right at junction and use shared-use path.

Island to afford protection to crossing cyclists. Right turn lane to be used as refuge in centre of carriageway.

Cyclists turn onto central splitter island - requires dropped kerbs

Route alignment eastbound to old city

Use of coloured surfacing or textured / ribbed surfacing to act as traffic calming.

Cyclists rejoin northbound carriageway

Cyclists rejoin southbound carriageway

Route alignment westbound to University of Nicosia

Cyclists use shared-use path to negotiate right turn southbound using proposed crossings.

Re-allocate carriageway space denoted with hatching to increase path by approx. 1.0m

Ensure four dropped kerbs at this location are up to 1.0m wider than crossing area widths to allow for shared use.

KEY
- Shared use pavement
- Path of cyclists through junction
- Dropped kerbs

Install carriageway marking with coloured surfacing to highlight cycle route for motorists exiting side roads. (see note for explanation)

7.0m

Install domed mini roundabout with over-run area, diameter 7.0m with associated lane markings to emphasise new junction layout.

Facilitate two-way for cyclists on one-way street. Use build-outs at each end of the road with advisory lane marking (options a, b & c only). Width of cycle lane to be 1.50m minimum.

Install speed hump or table

Kerb build-outs to prevent parked vehicles blocking entrance to path. (2m from carriageway edge)

Install speed hump for entry into Ionos from Grivas Digenis and incorporate into existing splitter island.

Signage indicating two-way for cyclists eg. UK

Drawing Title

COMMENTS ON PRODROMOU STREET SCHEME
OPTION (a)

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

COLIN BUCHANAN

Scale:	1:1250@A2
Designed by:	PL
Drawn by:	AM
Chkd/App:	PL
First Issued:	AUG '10
Job No:	17151-02-1

Rev	Date	Amendment	Des.	Drn.

Drg No: 171512-OS-004

Rev

I:\17151-02-X_Nicosia PT Enhancement - Cycling Network\3. Project\3.3 Graphics\3.3.2 CAD\171512-OS-004.dwg

Not To Scale

KEY

Path of cyclists through junction

Dropped kerbs

Remove 2-3 trees to provide dropped kerb for shared-use path (two-way) northern side of Sina.

To Pedeios river route & old town

Pedestrian/cyclist crossing

Install domed mini roundabout with over-run area, diameter 7.0m with associated lane markings to emphasise new junction layout.

7.0m

Install carriageway marking with coloured surfacing to highlight cycle route for motorists exiting side roads. (see note for explanation)

Install carriageway marking with coloured surfacing to highlight cycle route for motorists exiting side roads. (see note for explanation)

DRAFT FOR COMMENTS ONLY

Drawing Title

COMMENTS ON PRODROMOU SCHEME
OPTION (d)

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

COLIN BUCHANAN

Scale:	1:1250@A2
Designed by:	PL
Drawn by:	AM
Chkd/App:	PL
First Issued:	AUG '10
Job No:	17151-02-1

Rev	Date	Amendment	Des.	Drn.

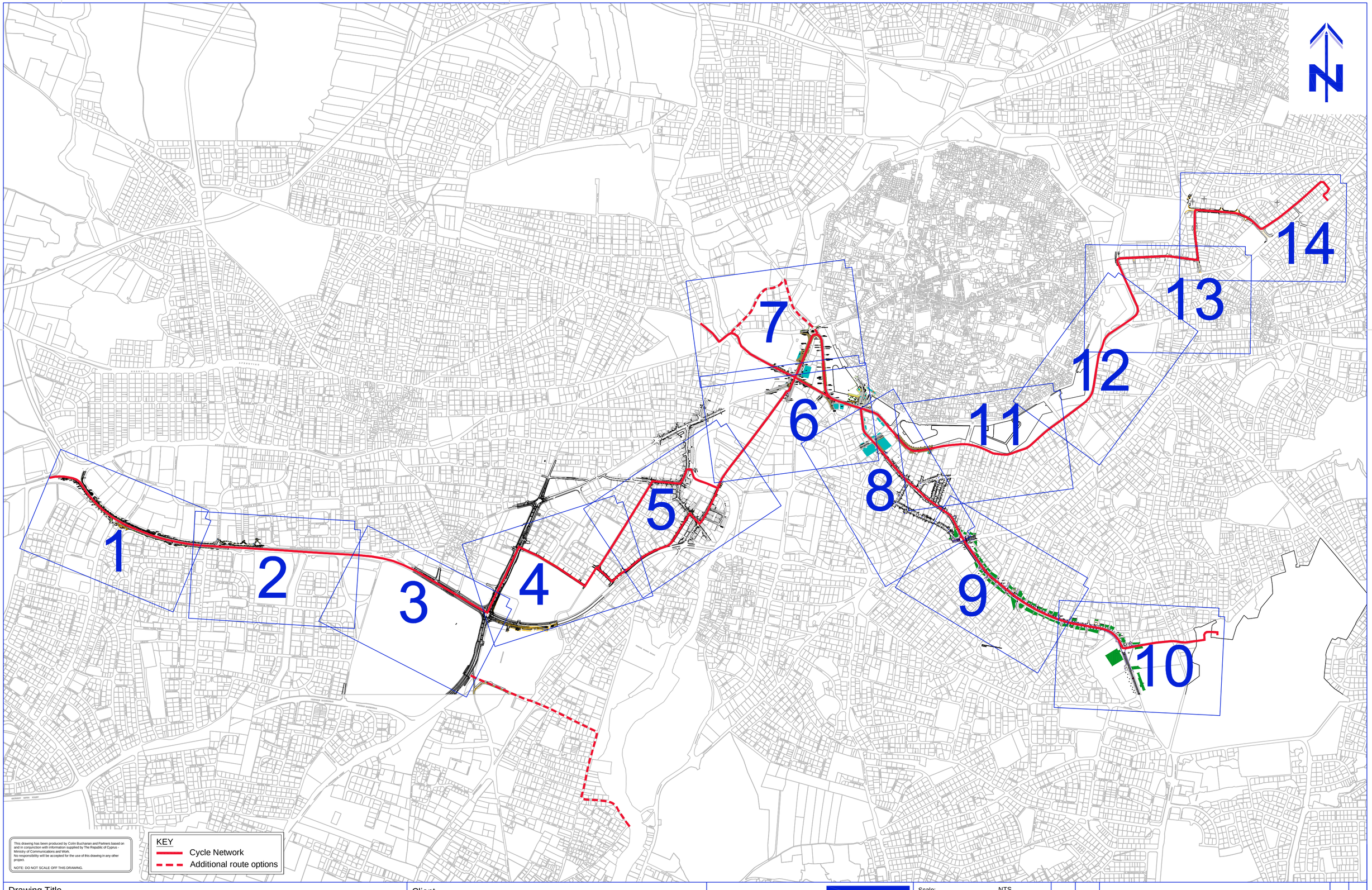
Drg No: 171512-OS-007

Rev

I:\17151-02-X_Nicosia PT Enhancement - Cycling Network\3. Project\3.3 Graphics\3.3.2 CAD\171512-OS-007.dwg

Appendix 3

First Priority Cycling Network: Key Plan



Drawing Title

FIRST PRIORITY CYCLE NETWORK - PRELIMINARY DESIGN
KEY PLAN

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

COLIN BUCHANAN

Scale:	NTS
Designed by:	PL
Drawn by:	AM
Chkd/App:	
First Issued:	
Job No:	17151-02-1

Rev	Date	Amendment	Des.	Drn.

Drg No: 171512-OS-001

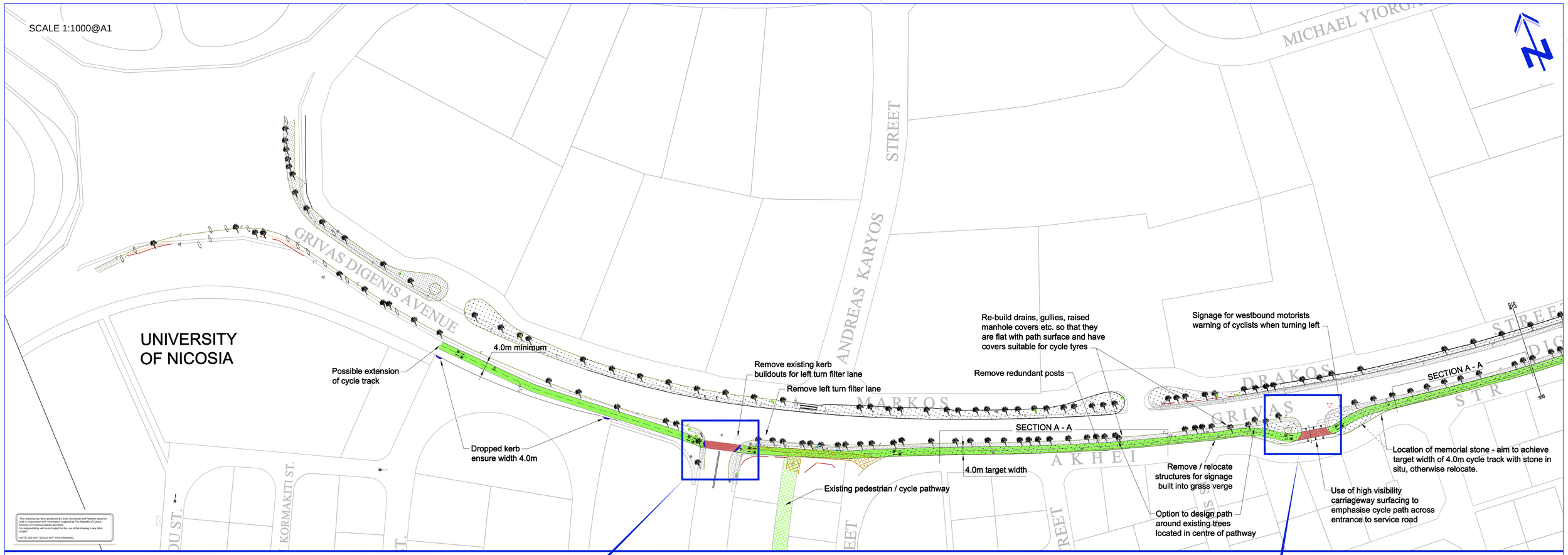
Rev

I:\17151-02-X_Nicosia PT Enhancement - Cycling Network\3. Project\3.3 Graphics\3.3.2 CAD\171512-OS-001.dwg

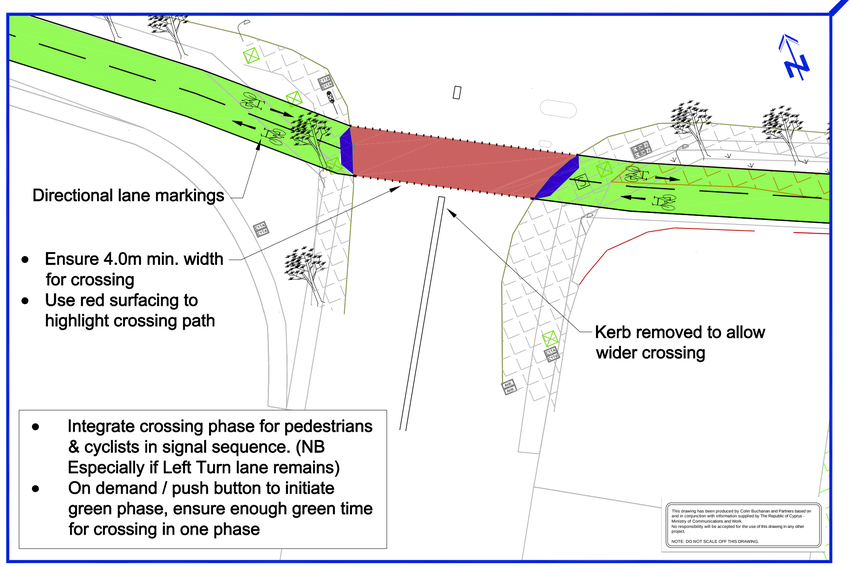
Appendix 4

First Priority Cycling Network: Drawings for Sections 1 to 7

SCALE 1:1000@A1



October 28 Junction



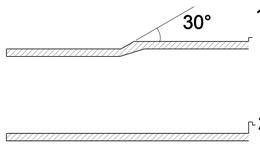
- Ensure 4.0m min. width for crossing
- Use red surfacing to highlight crossing path

- Integrate crossing phase for pedestrians & cyclists in signal sequence. (NB Especially if Left Turn lane remains)
- On demand / push button to initiate green phase, ensure enough green time for crossing in one phase

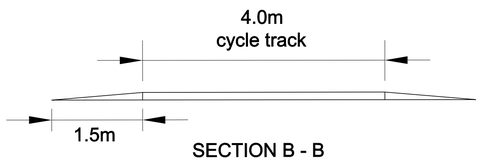
Inset
1:250@A1

Design options where verge is inclined

SECTION A - A

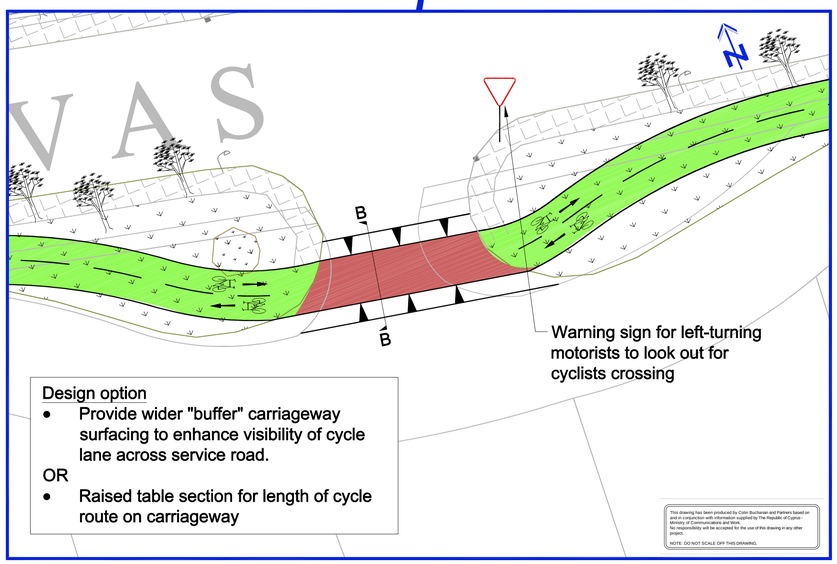


1. Build stepped path to compensate for incline but ensure step is angled eg. 30° or less
2. Build path to lower level by excavating ground to level off



NOT TO SCALE

Akhei Street Access



Design option
- Provide wider "buffer" carriageway surfacing to enhance visibility of cycle lane across service road.

OR
- Raised table section for length of cycle route on carriageway

Inset
1:250@A1

Drawing Title

FIRST PRIORITY CYCLE NETWORK - PRELIMINARY DESIGN
SHEET 1 OF 14

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

COLIN BUCHANAN

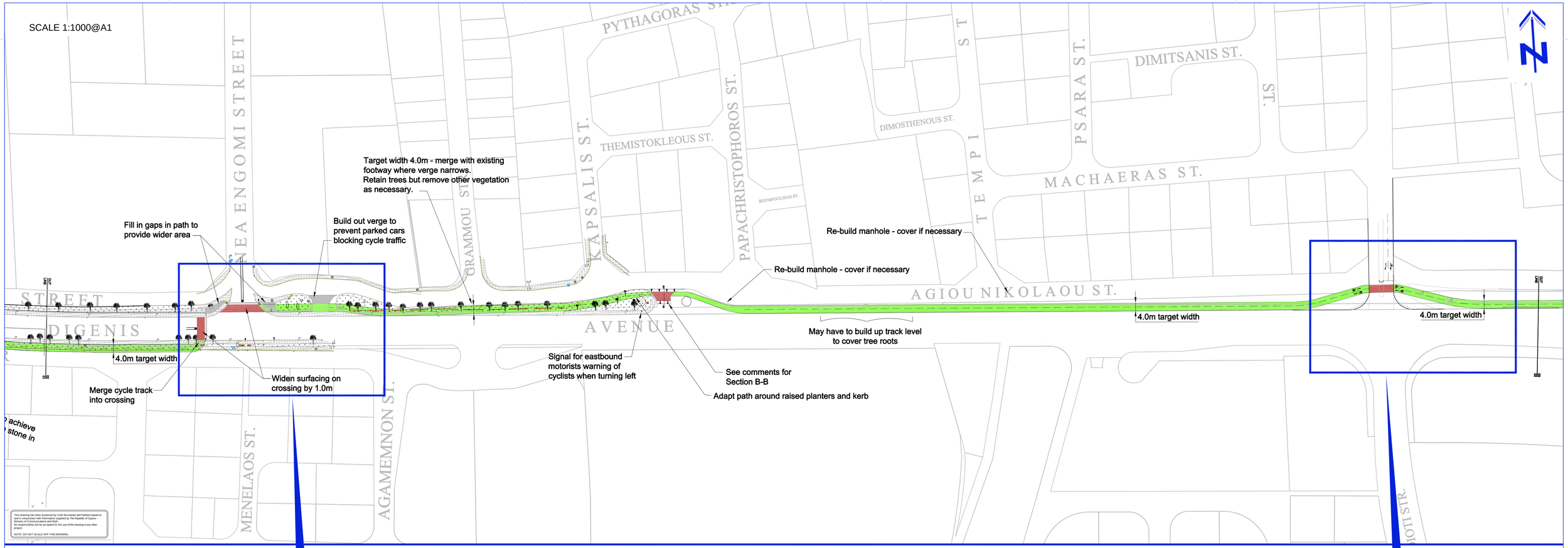
Scale:	AS SHOWN
Designed by:	P.L.
Drawn by:	A.M./J.J.
Chkd/Appd:	K.W.
First Issued:	SEPT. '10
Job No:	17151-02-1

Rev	Date	Amendment	Des.	Drn.

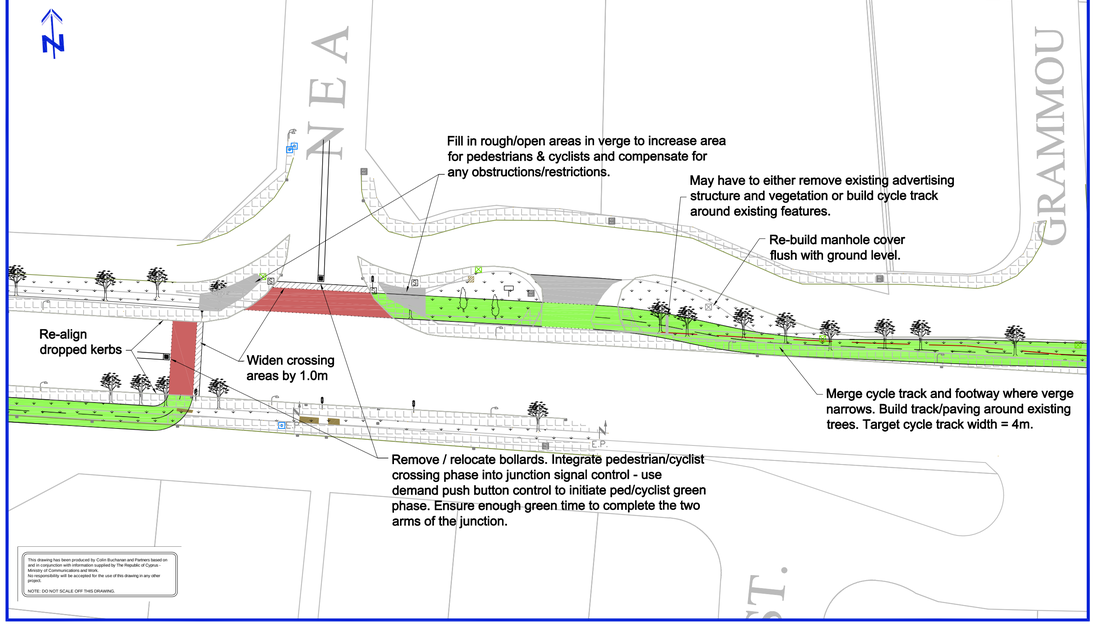
Drg No: 171512-OS-002/01 Rev

I:\17151-02-X_Nicosia PT Enhancement - Cycling Network\3. Project\3.3 Graphics\3.3.2 CAD\171512-OS-002.dwg

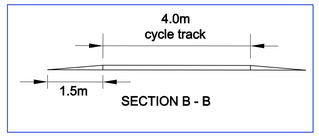
SCALE 1:1000@A1



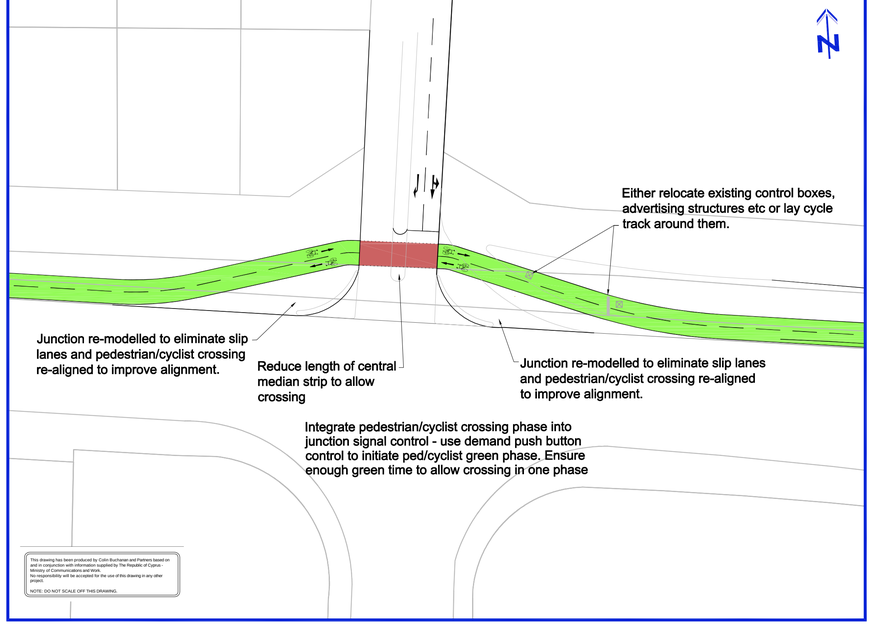
Crossing at Nea Engomi street



Inset
1:500@A1



March 25 Junction



Inset
1:500@A1

Drawing Title

FIRST PRIORITY CYCLE NETWORK - PRELIMINARY DESIGN
SHEET 2 OF 14

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

COLIN BUCHANAN

Scale:	AS SHOWN
Designed by:	P.L.
Drawn by:	A.M./J.J.
Chkd/Appd:	K.W.
First Issued:	SEPT. '10
Job No:	17151-02-1

Rev	Date	Amendment	Des.	Drn.

Drg No: 171512-OS-002/02

Rev

I:\17151-02-X_Nicosia PT Enhancement - Cycling Network\3. Project\3.3 Graphics\3.3.2 CAD\171512-OS-002.dwg

SCALE 1:1000@A1

Possible future cycle route to old town via Metochian Street and Chelon Street

See Section B-B

Option 1: Investigate re-alignment of car parking to widen cycle track

Possible area for acquisition

4.0m target width

Grigori Afxentiou Street

Junction treatment to improve safety on cycle route

Iakovou Palatsou Street

Area that can be utilised for wider pedestrian and cycling facilities. Ensure at least 5.0m width for pedestrian/cyclist pathway

Signal for eastbound motorists warning of cyclists when turning left

Option 2: Merge cycle track and footway

Align cycle track around existing trees as necessary

Relocate highway width from central reservation to facilitate 6.0m wide path.

KOLOKOTRONIS ST

AGIOU NIKOLAOU STREET

ANDREA CHALIOU STR.

G R I V A S D I G E N I S A V E N U E

STADIUM STREET

European University

Archangelou Junction

A width of 5m along Grivas Dgenis would improve conditions for path users.

Proposed width including verge is 5.0m approx.

Grivas Digenis Avenue

Agios Proropios Street

CUT LINE

Inset
1:500@A1

Drawing Title

FIRST PRIORITY CYCLE NETWORK - PRELIMINARY DESIGN
SHEET 3 OF 14

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

Scale:	AS SHOWN
Designed by:	P.L.
Drawn by:	A.M./J.J.
Chkd/Appd:	K.W.
First Issued:	SEPT. '10
Job No:	17151-02-1

Rev	Date	Amendment	Des.	Drn.

Drg No: 171512-OS-002/03

Rev

I:\17151-02-X_Nicosia PT Enhancement - Cycling Network\3. Project\3.3 Graphics\3.3.2 CAD\171512-OS-002.dwg

SCALE 1:1000@A1

Remove guardrailing across path or re-align with wider gap between them.

Ensure connectivity with adjoining streets with dropped kerbs or fill in gaps between paths as necessary

Proposed raised table where pedestrians and cyclists will cross.

Relocate highway width from central reservation to facilitate 5.0m width path.

Widen signalised crossing facilities and zebra crossing for both cyclists and pedestrians,up to 4.0 to 5.0m, and signage required to indicate route.

Ensure connectivity with adjoining streets with dropped kerbs or fill in gaps between paths as necessary

Remove guardrailing across path or re-align with wider gap between them.

Remove all guardrailing and make path surface level across full width. (This section has priority)

Remove all guardrailing and make path surface level across full width. (This section not part of first priority cycle network).

Install carriageway marking with coloured surfacing to highlight cycle route for motorists exiting side roads. (option using Vasilis Michaelides St).

Install domed mini roundabout with over-run area, diameter 7.0m

7.0m

Install speed hump or table

Facilitate contraflow for cyclists on one-way street - build-outs at each end of road with advisory lane marking (options using Ionas Street only). Width of contraflow to be 1.5m minimum).

Signage indicating two-way for cyclists e.g. UK

Install speed humps or entry into Ionas from Grivas Digenis

Path finishes at Mikhalis Karaoi

Inset
1:250@A1

Build out no greater than 2.0m approx.

Kerb Build-out with 'No Parking' Sign.

Cyclist/pedestrian path

Drawing Title

FIRST PRIORITY CYCLE NETWORK - PRELIMINARY DESIGN
SHEET 4 OF 14

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

COLIN BUCHANAN

Scale:	AS SHOWN				
Designed by:	P.L.				
Drawn by:	A.M./J.J.	Rev	Date	Amendment	Des. Drn.
Chkd/Appd:	K.W.				
First Issued:	SEPT. '10	Drg No:		171512-OS-002/04	Rev
Job No:	17151-02-1				

I:\17151-02-X_Nicosia PT Enhancement - Cycling Network\3. Project\3.3 Graphics\3.3.2 CAD\171512-OS-002.dwg

SCALE 1:1000@A1

Install domed mini roundabout with over-run area, diameter 7.0m with associated lane markings to emphasise new junction layout.

7.0m

Remove 2-3 trees to provide dropped kerb for shared-use path (two-way) northern side of Sina.

Vasilis Michaelides St. Route Option 'd'

Vasilis Michaelides Street

Pedestrian cyclist crossing

Vasilis Michaelides Street

Install carriageway marking with coloured surfacing to highlight cycle route for motorists exiting side roads. (use for route option along Vasilis Michaelides)

Pedigos River cycle route (to be built)

Georgalla Street

Herodotos Street

Install speed hump or table

Ion Street

Ion Street

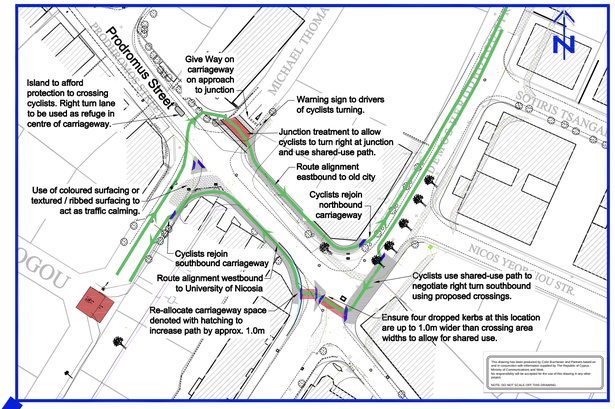
Install carriageway markings emphasising presence of cyclists.

Ionas Route Option

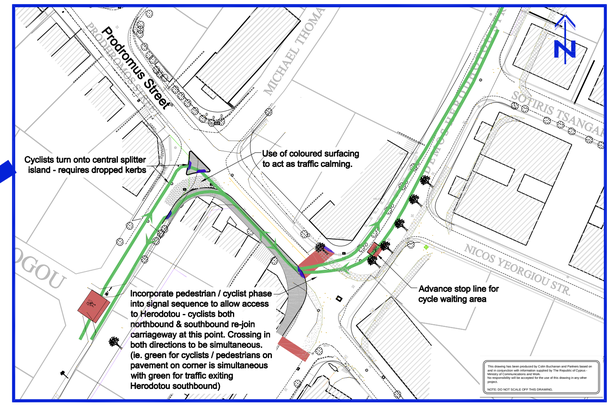
KEY

Path of cyclists through junction

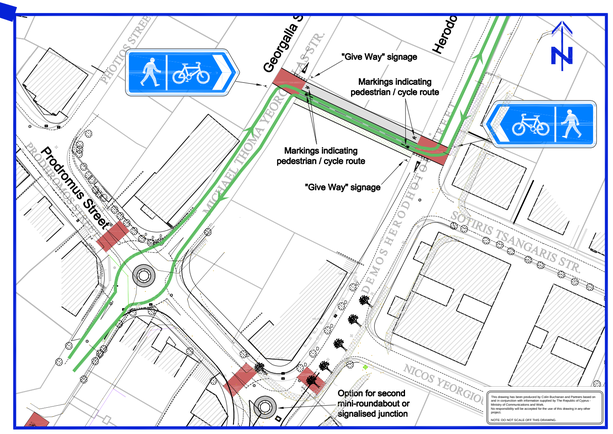
Dropped kerbs



Option 'a'
1:1000@A1



Option 'b'
1:1000@A1



Option 'c'
1:1000@A1

Drawing Title

FIRST PRIORITY CYCLE NETWORK - PRELIMINARY DESIGN
SHEET 5 OF 14

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

COLIN BUCHANAN

Scale:	AS SHOWN
Designed by:	P.L.
Drawn by:	A.M./J.J.
Chkd/Appd:	K.W.
First Issued:	SEPT. '10
Job No:	17151-02-1

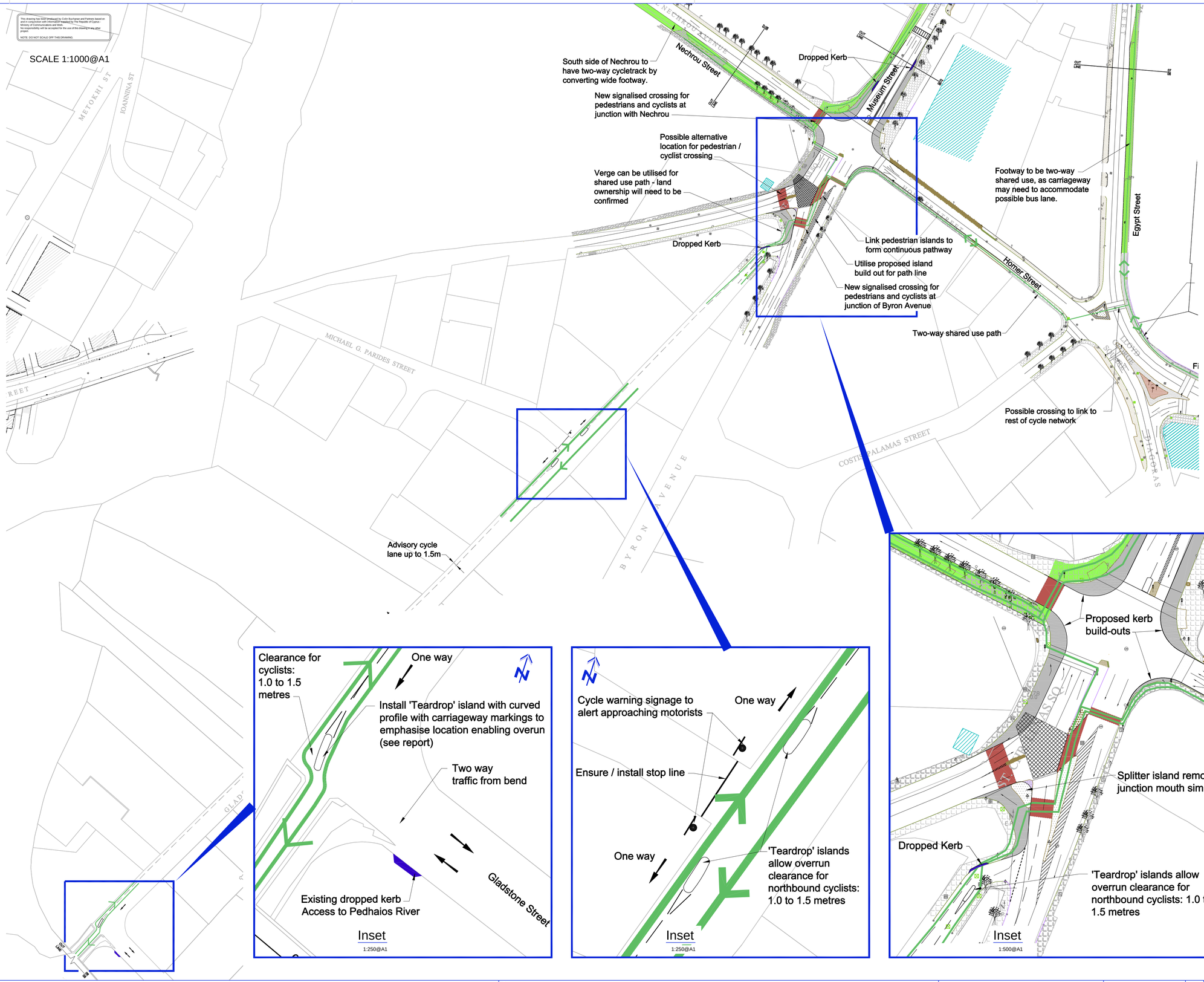
Rev	Date	Amendment	Des.	Drn.

Drg No: 171512-OS-002/05

Rev

n:\17151-02-X_Nicosia PT Enhancement - Cycling Network\3. Project\3.3 Graphics\3.3.2 CAD\171512-OS-002.dwg

SCALE 1:1000@A1



Drawing Title

FIRST PRIORITY CYCLE NETWORK - PRELIMINARY DESIGN
SHEET 6 OF 14

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

COLIN BUCHANAN

Scale:	AS SHOWN
Designed by:	P.L.
Drawn by:	A.M./J.J.
Chkd/Appd:	K.W.
First Issued:	SEPT. '10
Job No:	17151-02-1

Rev	Date	Amendment	Des.	Drn.

Drg No: 171512-OS-002/06

Rev

I:\17151-02-X_Nicosia PT Enhancement - Cycling Network\3. Project\3.3 Graphics\3.3.2 CAD\171512-OS-002.dwg

SCALE 1:1000@A1

Parthenonus Street leads to existing cycle route on Eleftheriou Venizelou

Raised table at junction

Convert existing footway to shared use for two way cycling. Option to acquire land to provide extra width utilising existing landscaping.

Proposed dropped kerb for cyclists to re-join carriageway.

Widen footway on corner

Existing crossing to incorporate cycle crossing

Footway on both sides of bridge to be shared use

Two-way shared use path linking to Nechrou

Possible future link and crossing locations for cycle route on Cinyras Street.

Recommendation to build two-way cycle track on south side of Cinyras Street - will need to link with cycle network at junctions either end.

Two-way shared use path linking to Nechrou

South side of Nechrou to have two-way cycletrack by converting wide footway.

New signalised crossing for pedestrians and cyclists at junction with Nechrou

Dropped Kerb

Cycle track under construction

Possible junction layout if Mousieou to be pedestrianised in long term

Signalised crossing for pedestrians / cyclists

Share use path on Aigyptou

Fill-in Bus Lay-By

Inset
1:500@A1

Two way cycle track currently constructed

Widen crossing refuge

Possible circulatory lane marking for roundabout (depends on option for Mouseiou).

Possible reduction of carriageway to two lanes eastbound.

Ideal crossing point to link with proposed two way cycle route around old town

Proposed pedestrian / cyclist crossing if junction is re-modelled

Possible future conversion of footway widen for two-way shared use

Possible option to remodel junction as four-arm crossroads (depends on options for Mouseiou)

Drawing Title

FIRST PRIORITY CYCLE NETWORK - PRELIMINARY DESIGN
SHEET 7 OF 14

Client

REPUBLIC OF CYPRUS
MINISTRY OF COMMUNICATIONS AND WORKS

Job Title

NICOSIA PT ENHANCEMENT - CYCLING NETWORK

20 Eastbourne Terrace
London
W2 6LG

T 020 7053 1300
F 020 7053 1301
www.cbuchanan.co.uk

Scale:	AS SHOWN
Designed by:	P.L.
Drawn by:	A.M./J.J.
Chkd/Appd:	K.W.
First Issued:	SEPT. '10
Job No:	17151-02-1

Rev	Date	Amendment	Des.	Drn.

Drg No: 171512-OS-002/07

Rev

Colin Buchanan
20 Eastbourne Terrace Paddington London W2 6LG **T** 020 7053 1300 **W** colinbuchanan.com