

# Garden Village & Town Standards for the 21st Century

A practical guide:

Planning  
Active Travel  
Networks  
- in New  
Communities



**Almere Consulting**  
Sustainable Development Solutions



Almere Consulting are consultants working across regeneration and sustainable transport. The firm offers a multi-discipline approach examining transport, economics, development viability and land use planning.

The firm is currently working as part of a multidisciplinary team to develop a Locally Led Garden Village in Northumberland.

This guide is written to assist others working on similar projects and to promote better design for active travel across the industry.

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# A practical guide

## Planning Active Travel Networks in New Communities

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## A practical guide: Planning Active Travel Networks in New Communities

The TCPA have produced an excellent set of guides intended to help local authorities and promoters “ensure that new large-scale developments become socially and economically successful places – places that will improve over time, and in which people will want to live for generations to come”.

This additional guide has been produced by Almere Consulting to bridge the gap between the TCPA guides, Manual for Streets and current design guidance for walking and cycling endorsed by Department for Transport as defined in the Welsh Active Travel Design Guidance, the London Cycle Design Guidance and Highways England’s IAN95/16. Scotland’s Cycling By Design is currently being updated and will be incorporated later in 2017.

Although written for a UK context many of the principles and techniques described here can be applied internationally.



This guide is intended to assist in the design of networks at masterplanning stage, it does not cover the detailed design of walking and cycling infrastructure. Descriptions are provided of types of infrastructure in order to develop understanding of the role that they play in creating a network, practitioners should refer directly to the London and Welsh guidance for design detailing.

The guide discusses design issues which are prevalent at the scale of a Town or Village, many of these will also be applicable for cities. The format and appearance of this document deliberately draws on the look and feel of the TCPA guides but represents only the views of the authors and has no official endorsement from the TCPA.

### The Garden City principles

The TCPA define a Garden City as “a holistically planned new settlement that enhances the natural environment and offers high-quality affordable housing and locally accessible work in beautiful, healthy and sociable communities. These principles are being extended to smaller Garden Village and Town settlements.

The principles are an indivisible and interlocking framework for the delivery of Garden Settlements, and include:

- Land value capture for the benefit of the community.
- Strong vision, leadership and community engagement.
- Community ownership of land and long-term stewardship of assets.
- Mixed-tenure homes and housing types that are genuinely affordable.
- A wide range of local jobs in the Garden City within easy commuting distance of homes.
- Beautifully and imaginatively designed homes with gardens, combining the best of town and country to create healthy communities, and including opportunities to grow food.
- Development that enhances the natural environment, providing a comprehensive green infrastructure network and net biodiversity gains, and that uses zero-carbon and energy-positive technology to ensure climate resilience.
- Strong cultural, recreational and shopping facilities in walkable, vibrant, sociable neighbourhoods.
- Integrated and accessible transport systems, with walking, cycling and public transport designed to be the most attractive forms of local transport.”

resources from the TCPA can be found at <http://www.tcpa.org.uk/pages/garden-cities.html>

# Summary

The New Towns and Garden Villages built in the 21<sup>st</sup> Century must be exemplars of sustainable and healthy living, they must deal with the twin challenges of climate change and inactive lifestyles. Health and climate change affect every aspect of planning for new and renewed places with high quality active travel networks being key to good design.

The conditions in which people are born, study, work and grow old have a huge impact on public health which is now a statutory responsibility for Councils. Many local authorities are currently exploring how they make use of new opportunities to improve health through the multiple levers available in local government that shape these influences on health. The design of new communities can contribute to positive health outcomes through green spaces, housing, transport and public realm. Improving health and wellbeing is a requirement of the National Planning Policy Framework, good design is key to achieving this.

Transport accounts for around a quarter of UK greenhouse gas emissions and affects air quality at the roadside. The impacts of climate change are happening now. We are seeing an increase in extreme weather events, with knock-on effects on economies and societies. It is now inevitable that the earth will continue to warm, due to inertia in the climate system, and temperatures are very likely to increase by at least 2°C by the end of the century.

This Practical Guide emphasises the need to undertake active travel network design early in the masterplanning process and to treat it as a serious undertaking based on scientific principles.

This Practical Guide has four main messages:

- A comprehensive and safe network implies dense provision of high quality walking and cycling infrastructure.
- Providing permeability is not enough, networks must be legible and key routes prioritised over motorised modes.
- To ensure that this infrastructure is affordable it must be located carefully and whilst some parts of the network will run through green space, many will not.
- Providing high quality infrastructure on principal streets in a development has implications for street width which must be confronted by designers without resorting to reducing the quality of provision.

# 1 Introduction

Human activities are already influencing the climate. 2015 saw a high incidence of extreme flood events across the globe, including severe floods in Cumbria and Lancashire in the UK. Global average temperatures are already 1°C higher than in pre-industrial times. As temperatures rise, so too does the risk of increases in both the frequency and the severity of extreme weather events.

Transport represents almost a quarter of Europe's greenhouse gas emissions and is the main cause of air pollution in cities. The transport sector has not seen the same gradual decline in emissions as other sectors: emissions only started to decrease in 2007 and still remain higher than in 1990<sup>1</sup> (Figure 1). Within this sector, road transport is by far the biggest emitter accounting for more than 70% of all GHG emissions from transport in 2014.

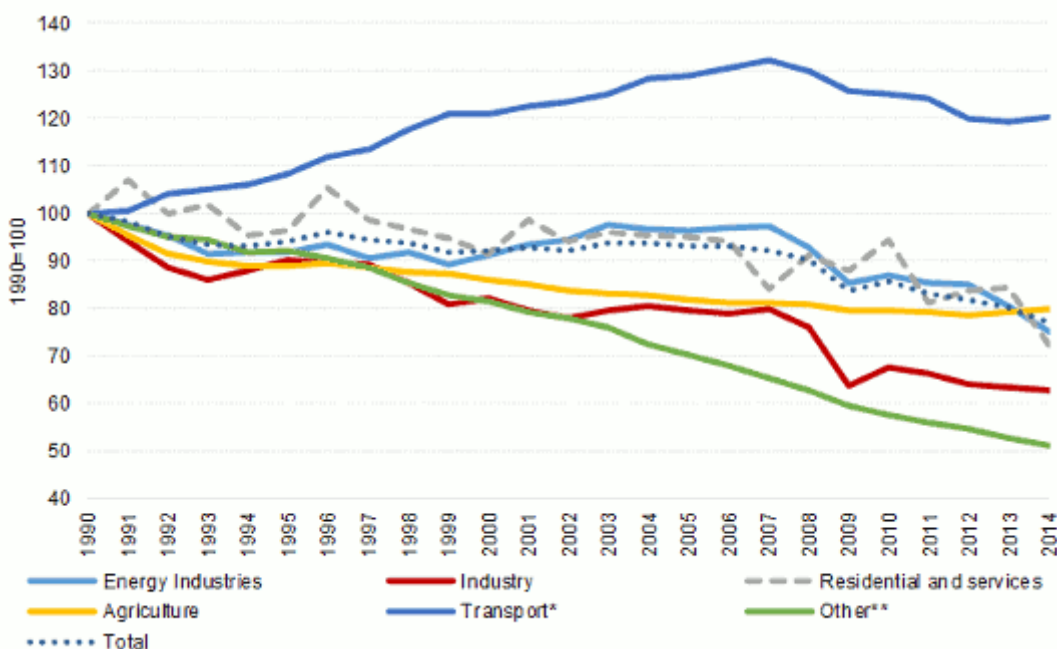


Figure 1 CO<sub>2</sub> emissions by sector - European Commission

Almost two-thirds of adults and one-third of children in England are either overweight or obese; there is a similar picture across the UK. Obesity is a major risk factor for type 2 diabetes, cancer and heart disease. It also can affect people's self-esteem and their underlying mental health. Reducing obesity, especially for children, is a priority for Public Health England (PHE) and health agencies across the UK. The causes of rapid increases in the levels of obesity are complex, and the influence of the environment where people live is one of the factors.

<sup>1</sup> Reducing Emissions from Transport – European Commission  
[http://ec.europa.eu/clima/policies/transport/index\\_en.htm](http://ec.europa.eu/clima/policies/transport/index_en.htm)

Obesity has been described as a ‘normal response by normal people to an abnormal environment’<sup>2</sup>. The physical environment influences how easy or difficult it is to maintain a healthy weight.

Specifically, a healthy-weight environment promotes physical activity of all sorts and ensures that sustainable transport and active travel is built into everyone’s daily life.<sup>3</sup> It helps people to access and choose healthier goods and services that support them in choosing a balanced diet, leading an active lifestyle and maintaining a healthy weight.

The TCPA’s “planning healthy-weight environments” suggests the following requirements in designing for active travel:

- Clearly signposted street network with destinations within 400-800 metres (5-10 minutes’ walk).
- **Streets are connected** to a coherent wider network designed to facilitate walking, including to public transport stops.
- Streets and the public realm are safe and accessible for all ages, and levels of disabilities.
- Well-designed buildings overlook the streets without compromising home privacy and security.
- **Walking & Cycling are prioritised** over private car use, and the speed of vehicles is managed.
- Direct, convenient, legible and safe cycling network design.
- Appropriate segregation or shared surfaces between cyclists, pedestrians and vehicle traffic.
- Streets/cycle paths are connected to coherent wider networks.

## 1.1 The Opportunity

Garden Cities and Garden Suburbs have a history of challenging orthodoxy in street design and have led to lasting change.

When Unwin and Parker designed Hampstead Garden Suburb they overturned bye-laws which had encouraged overly wide roads and developed a new street hierarchy based on accommodation roads and residential streets.

There is potential for the 21<sup>st</sup> Century wave of New Towns and Garden Villages to move forward best practice and challenge accepted practices in designing for active travel. These new settlements have the potential to restore the connection between design for active travel in new developments and current best practice (for both detail & network planning).

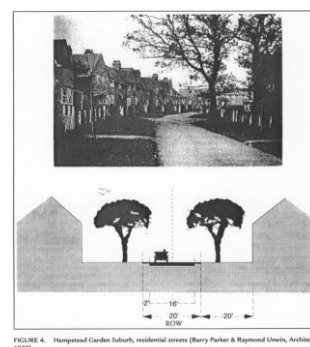


FIGURE 4. Hampstead Garden Suburb, residential street (Harry Parker & Raymond Unwin, Architects, 1909).

<sup>2</sup> ‘Urgently needed: a framework convention for obesity control’. The Lancet, 2011, Vol. 378 (9,793), p. 741. <http://www.thelancet.com/journals/lancet/article/PIIS0140-6736%2811%2961356-1/fulltext>

<sup>3</sup> Everybody Active, Every Day: An Evidence-Based Approach to Physical Activity. Public Health England, 2014.

<https://www.gov.uk/government/publications/everybody-active-every-day-a-framework-to-embed-physical-activity-intodaily-life>

New Garden Villages, Towns and Cities must be beacons of best practice – creating communities that are environmentally, socially and economically sound. They should be exemplar developments in terms of effective approaches to the creating direct, convenient, legible and safe walking and cycling network design.

## 1.2 Lessons from the New Towns

The UK's New Towns constructed during the second half of the 20<sup>th</sup> Century in many cases attempted to provide a segregated walking and cycling network. These networks have performed poorly. Key problems include:

- Providing a network density half that required, a problem exacerbated by impermeable street layouts.<sup>4</sup>
- Terminating routes at the edge of the town centre rather than encouraging movement through for all active modes.
- Attempting to construct networks entirely comprised of traffic free paths away from the carriageway, creating undulating routes reliant on underpasses and leaving the principal streets hostile to walking and cycling.

## 1.3 About this Practical Guide

This Practical Guide outlines what convenient, legible and safe walking & cycling network design means in practice. It sets out principles for developing an active travel strategy for a New Town or Garden Village. It is intended not just for developers and planners, but also for those who will manage the new settlements and work with the new communities.

This guide is not intended as a detailed engineering guide, but instead concentrates on aspects of network design which must be considered at masterplanning stage.

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<sup>4</sup> Stevenage's network is spaced at up to 750 metres between routes, Cramlington in Northumberland has a 500 metre grid network, both are built at a mesh density more appropriate for motorised modes.



## 2 Policy Context

### 2.1 2011 Transport White Paper

The Government's vision for a sustainable local transport system is set out in the January 2011 Transport White Paper: "Creating Growth, Cutting Carbon – Making Sustainable Local Transport Happen." The White Paper acknowledges that transport provision is essential for economic growth if the Government is to improve the economic deficit which it is currently facing.

The Paper also recognises however, that the current levels of carbon emissions from transport cannot be sustained if the nation is to meet its national commitments on climate change as well as creating a safer and cleaner environment in which to live. The Government highlights sustainable transport solutions as a means by which the economy can grow which will also see a positive impact on the local environment.

The Local Transport White Paper states that the Government's vision is for: "A transport system that is an engine for economic growth but one that is also greener and safer and improves quality of life in our communities. By improving the links that move goods and people around, and by targeting investment in new projects that promote green growth, we can help to build the balanced, dynamic low carbon economy that is essential for our future prosperity"

### 2.2 The National Planning Policy Framework

The National Planning Policy Framework (NPPF) has recently superseded the Planning Policy Guidelines that governed national policy and principles relating to specific aspects of the town planning framework. In replacing the previous guidance notes and remaining a material consideration in planning applications; the NPPF provides a framework for local communities and Authorities to development relevant local development plans and strategies.

The NPPF has two key themes:

- Providing a greater level of integration and simplification of the planning policies governing new development nationally;
- Contribute to the achievement of sustainable development from an economic, social and environmental perspective.

One of the key changes relating to the NPPF is the new presumption in favour of sustainable development, which should be reflected in local development plans and frameworks to ensure that sustainable development and the needs of an area are identified and subsequently approved without delay.

The NPPF is based on a range of core planning principles, which are aimed at supporting the focus on sustainable plan-led development. Many of these core principles also formed part of

the previous planning guidance notes, such as supporting mixed use developments, encouraging effective re-use of brownfield land and managing patterns of growth.

Transport specific policies play a key role in supporting and achieving the core planning principles and are intrinsically linked to the objective of sustainable development.

The NPPF seeks to encourage solutions to support reductions in gas emissions and reducing congestion which should be enshrined in Local Plans, the key Transport messages include:

- "...facilitating development but also contributing to wider sustainability ..."
- "The transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel".
- Provision of viable infrastructure to support sustainable development "the planning system should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport".
- Supporting key interchange facilities;
- Provide a balanced land-use approach encouraging mixed use development which reduce the need to travel; and
- Create attractive town centre environments which are supported by appropriate car parking charging mechanisms.

The key public health messages include:

- "Take account of and support local strategies to improve health, social and cultural wellbeing for all"
- Developments should be located and designed where practical to give priority to pedestrian and cycle movements.... minimise conflicts between traffic and cyclists or pedestrians and establishing home zones"
- "Achieve places which promote opportunities for meetings between members of the community .....strong neighbourhood centres and active street frontages"

The core planning principles above provide a framework to provide inclusive, accessible, well connected and sustainable development.

## 2.3 Healthy Lives, Healthy People 2011

Relevant strategies from the Department of Health can and should be referenced as part of the planning process. Healthy Lives, Healthy People is the public health strategy for England published as a command paper in 2011. Although it does not set out detailed policies, it can be material consideration and considered in Local Plan preparation and/or comments on planning applications. It references the role of Health and Wellbeing Boards in considering local strategies including local planning policies.

## 2.4 Cycling and Walking Investment Strategy

In March 2016 Government set out its vision that by 2040, walking and cycling should be a normal part of everyday life, and the natural choice for shorter journeys such as going to school, college or work, travelling to the station, and for simple enjoyment.

Key messages include:

- We want everyone in the country to have access to safe, attractive routes for cycling and walking.
- We want to make cycling and walking the natural choice for shorter journeys, or as part of a longer journey

## 2.5 Working within the policy environment

The NPPF makes it clear that sustainable development should not be refused planning consent on Transport grounds except under exceptional circumstances. Sites must be allowed to be developed in a manner consistent with viability.

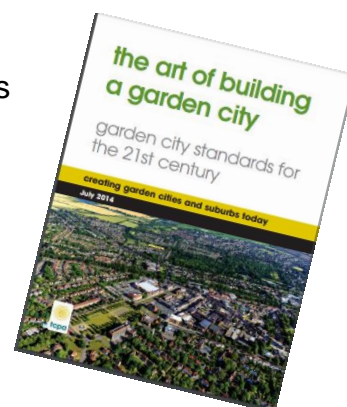
New Towns and Garden Villages offer potentially more funding for infrastructure than might usually be the case from conventional residential development. However, walking and cycling infrastructure must still be designed cost effectively if solutions from Garden Communities are to offer an exemplar of good design that can be applied across the industry.

New Towns and Garden Villages have the potential to lead the way in using design to implement new ways of living and cater for much higher levels of walking and cycling.

## 3 Objectives

The TCPA's "the art of building a garden city" describes three key features of a Garden City:

- “Development that enhances the natural environment, providing a comprehensive green infrastructure network
- Strong cultural, recreational and shopping facilities in walkable, vibrant, sociable neighbourhoods.
- Integrated and accessible transport systems, with walking, cycling and public transport designed to be the most attractive forms of local transport.”



“It is essential to ensure that neighbourhoods in new Garden Cities are **walkable**, offer easy access to a **safe and comprehensive cycle network**, and are also linked into an affordable, low-carbon public transport network for the Garden City and beyond.....Walking, cycling and low-carbon public transport should be the most convenient and affordable modes of transport in new Garden Cities. Design should allow for a **comprehensive and safe network of** footpaths and cycleways throughout the Garden City, with public transport nodes and neighbourhood facilities within a short walking distance (not more than 10 minutes) of all homes to reduce reliance on private cars. To promote healthy lifestyles for children, there should be a maximum walking distance of 800 metres from homes to the nearest school for children aged under 11”.

### 3.1 What is a comprehensive network?

A network is a 250-metre grid of routes optimised for walking & cycling.<sup>5</sup>

By this we mean a grid of paths and streets where surfacing, directness, legibility, & junction design are optimised for safe and efficient active travel.

A network is **not** “the **only** routes suitable for active travel”, the existence of a network does not excuse the creation of unwalkable or uncyclable streets within or nearby a development.

A network runs through the middle of walkable neighbourhoods where people live, work and play. It is vital that network grid sections run through the centre of development cells and retail centres, not around the outside.

When we build local networks associated with a development or destinations where people live and need to travel, these local networks will naturally combine to form District Networks. The grid sections that will be used most heavily are those that connect to bridges across natural and man-made barriers such as rivers and rail lines.

<sup>5</sup> Welsh Active Travel Guidance & CROW Design Manual for Bicycle Traffic



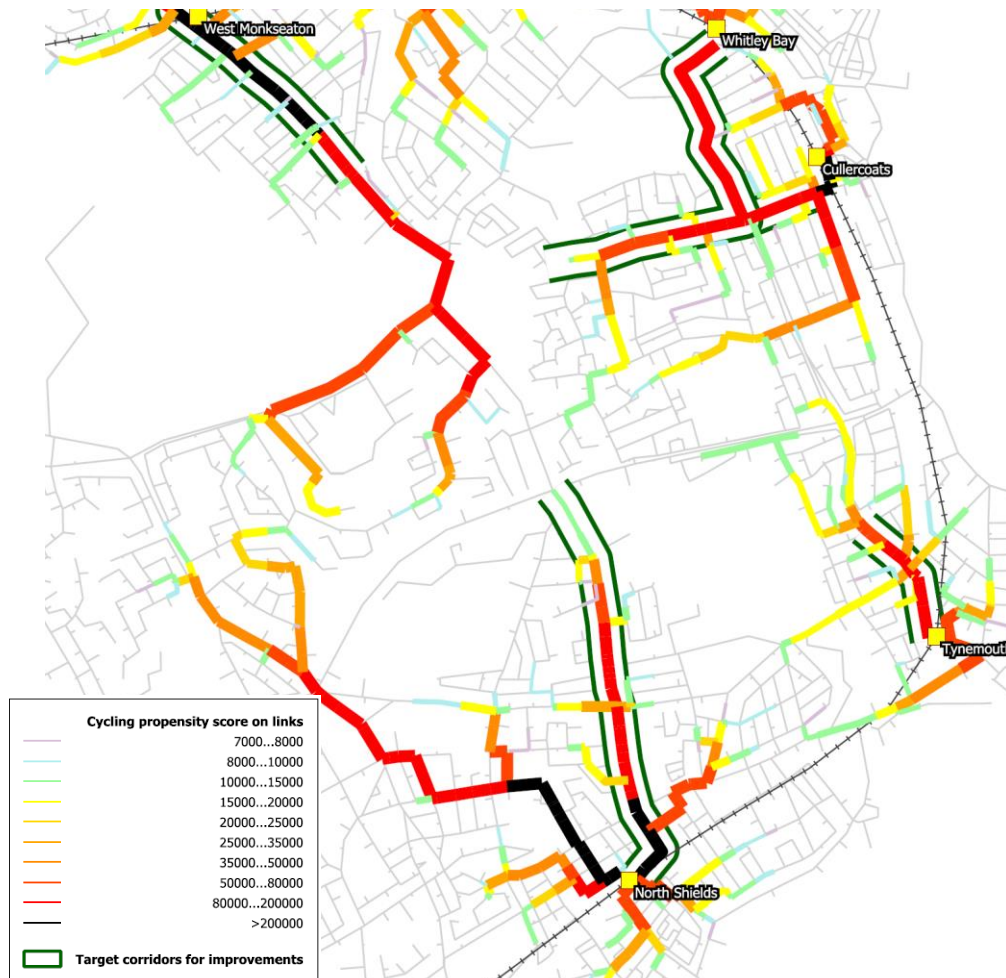


Figure 2 Network Plan – North Tyneside Towns, Villages & Light Rail Network (Sustrans)

The Sustrans network analysis above looks at which routes are likely to be heavily utilised using a weighted score based on population and propensity to cycle. Routes running through the centre of neighbourhoods score highly (shown in black or red). River and seafront routes score so poorly they are not highlighted even though these have traditionally been a focus for network development.

The 250 metre mesh density is specified in the Welsh Active Travel Design Guidance endorsed by the Department for Transport. Although there are other sophisticated ways to look at mesh density suggested by the CIHT Guide Planning for Cycling and the London Cycle Design Guide, for a new settlement a fixed network mesh is a more appropriate design tool.

The 250 metre mesh is specified for cycling networks and reflects a key objective that no resident should live more than 125 metres from the cycle network. These routes because of their qualities of directness and cohesiveness will also be attractive to pedestrians and should be designed for high levels of both walking and cycling.

The way that the grid is laid out is key to ensuring that it is affordable across a range of local housing markets. Running grid sections through the middle of neighbourhoods can imply

building a shorter network comprised of higher capacity sections and more extensive use of cycle streets.

The network grid will be comprised of the following components, each of which makes up approximately 1/3 of the network:



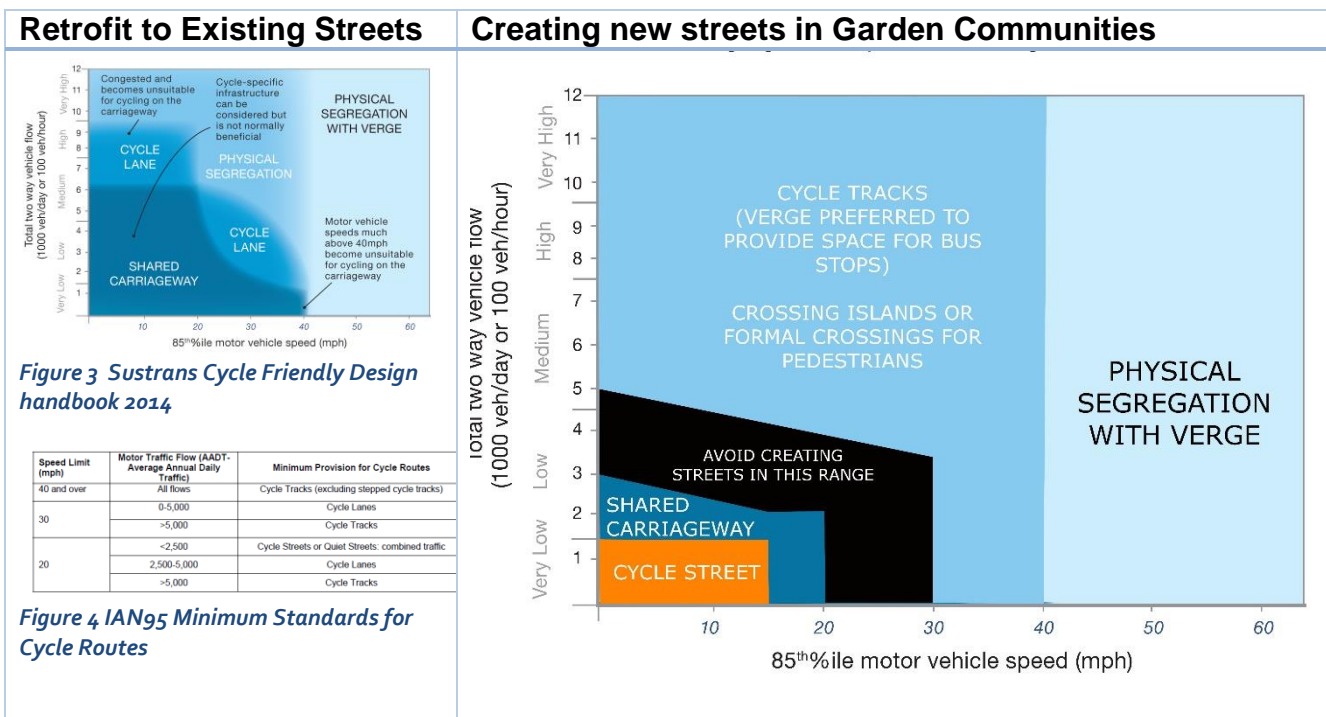
### 3.2 What is a safe network?

When retrofitting cycling infrastructure to existing streets practitioners typically use a matrix of motor traffic speed and volume such as those provided by Sustrans and Highways England below. It is important to note that this methodology is designed to prioritise infrastructure spending in an often tight financial climate.

Perceptions of safety are important, with concerns over the traffic environment being consistently cited as a barrier to higher levels of walking and cycling. Infrastructure must also be socially safe with good lighting and natural surveillance.

In a new residential development it is unlikely that sufficient car parking enforcement would be in place to allow effective operation of cycle lanes. Creating streets that carry several thousand vehicles a day without cycling infrastructure is far from ideal.

It is important to note that this level of provision will only be possible with careful design to limit the number of streets within a development that carry heavy traffic. For streets where walking or cycling shares a surface with motor traffic the quality of design and materials is key.



Where streets do not formally form part of the cycle network designers should still have regard to these limits. The concept of “an alternative route” has no place in an urban area.

### 3.3 What is an attractive Network

The excellent “Making Space for Cycling” by user campaign group Cyclenation sets out ten principles, which are often echoed by user groups representing pedestrians.

- **People need space for cycling** - mixing with traffic puts people off cycling, especially children.
- **People like simple, direct routes** - maintains momentum, and routes are shorter and wayfinding is easier.
- **People prefer cycling away from pedestrians** - shared-use pavements alongside roads benefit nobody. Such pavements are inconvenient, slow, and inappropriate space from pedestrians.
- **People want to maintain momentum** - stop-start cycling is very hard work. Cycle infrastructure should never involve 90° angle turns but instead should aim towards smoothness of movement. Cycle tracks along a road must not give way at every side road or driveway.
- **People want to be visible** - cycle infrastructure should be designed to allow people see each other regardless of what type of vehicle they are using.
- **People like level surfaces** – a route with constantly varying heights requires more effort to ride on and is less comfortable. At driveways and junctions the cycleway should not change height.
- **People want unobstructed routes** - Obstructions of any kind make cycling much more difficult, especially for those with disabilities, or using tricycles or trailers.



- **People want to cycle away from parked cars** - Car parking must be off-street rather than obstructing the carriageway. Parked cars result in dangerous manoeuvres.
- **People need somewhere to park their bike** - good quality cycle parking is essential for the start and end of a journey. This means providing secure stands near the entrance to a building and on-street.
- **People want well-maintained infrastructure** - cycle tracks should be laid to the same quality as streets designed to facilitate easy maintenance, to avoid overgrowing vegetation and enable winter treatment.

## 3.4 Networks & Walkable Neighbourhoods

The New Urbanist tradition in masterplanning suggests that a mixed use urban area should be made up of a series of “walkable neighbourhoods”, each a five minute walk (400 metres) from edge to edge.

The idea of a network designed for efficient active travel movement is highly compatible with the idea of walkable neighbourhoods but the two are not the same. A walkable neighbourhood reduces the need to travel, a network accepts the need to travel and prioritises active modes.

A cycling route which is also optimised also for longer walking trips will need to be designed for directness and legibility delivering a level of service over and above the norm.

Simply connecting a series of walkable neighbourhoods together does not deliver an efficient network. In order to prioritise through routes for walking and cycling over access routes for local car traffic, it is necessary first to identify where these routes are.

A new settlement designed on urbanist principles that also contains an active travel network will have a subset of streets where the detailed design caters more for active movement. Junctions will be designed so cyclists conserve momentum, walkers get a direct route and both have consistent priority over car traffic.

## 3.5 Common pitfalls

Many new housing developments claim exemplar status for walking and cycling, but often measures fail both at street level and at network level. Common pitfalls include:

- Assuming every street is fit for walking & cycling, when user experiences can be poor.
- Offering single landmark traffic free path or greenway that spends the budget without delivering a comprehensive network
- Using vague terminology, “routes”, “paths”, “network” interchangeably
- Green corridors – often routes for wildlife & dog walking are confused with key routes for active travel
- Quality & detailing on principal streets can often fail to reflect best practice.




- Inappropriate use of “shared use” walking and cycling paths within urban areas and along active frontages
- Failing to allow enough space to design junctions in a way that prioritises walking and cycling

# 4 Principles for success

## 4.1 Network Components

The network is made up of three core types of walking and cycling infrastructure. In a well-designed active travel environment these components will often each make up one third of the network.

Component	Proportion of network (indicative)	
<p>Cycle Tracks &amp; Footways</p> <p>Next to (or considered part of) the carriageway.</p>	1/3	
<p>Cycle Paths &amp; Foot Paths</p> <p>Away from the carriageway (Parks, green space, traffic free connectors)</p>	1/3	
<p>Cycle Streets &amp; Footways (or Quietways)</p> <p>Low motor traffic, designed as legible routes optimised for walking &amp; cycling.</p>	1/3	

## 4.2 Main Street

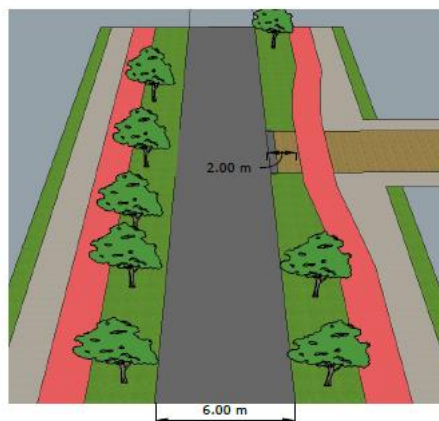
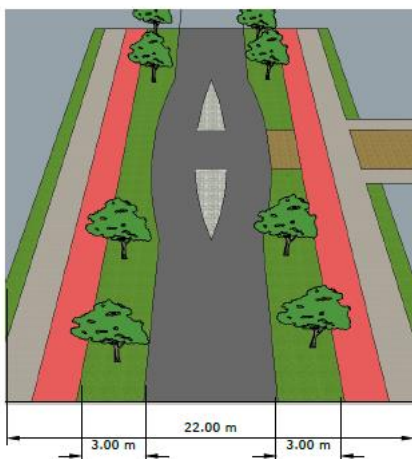
The Main or Principal Streets in a development are those that carry higher volume of motor traffic and in most cases, provide a bus route or routes through a residential development. Main Street should be designed with Cycle Tracks & Footways on both sides of the carriageway.

- Segregated space for walking and cycling often takes more width than that for buses and cars.
- Provide for cycling on both sides of the carriageway
- Adding green space &/or SUDS will result in a street over 20 metres wide
- Although a verge is not required for 30mph streets, a multifunctional verge or flexible strip can be necessary in order to accommodate car parking and bus stops.

The width and the cost of constructing streets of this type means that they have to be used frugally within a New Town or Garden Village.

Cycle Tracks may be a mix of 2 Way & Unidirectional depending on desire lines. Designers should have regard to the poor safety record of 2 Way Cycle Tracks in some contexts. 2 Way Tracks should be used sparingly, junction design will have similar considerations to service roads.

There are significant implications for car & bus networks, if too many of these streets are included in a development designers will find that costs mount and segregated infrastructure competes with SUDS for space within the development.



Main Street as a 22 metre Boulevard, running from the gateway of the development with first two housing cells either side.

Two way street with three metre wide landscaping (SUDS + Large Trees) and one metre secondary landscaping.

2 metre footways and unidirectional cycleways.



Figure 5 Example Main Street profile, 22 metres wide, unidirectional cycle tracks

In some contexts, Main Street might be constructed as a single surface, although this may prove controversial with blind and partially sighted users. A single surface has advantages for both pedestrians and cyclists in that it removes trip and wheel trap hazards.

## 4.3 Place Matrix

The London Cycle Design Standards introduce the concept of a “Place Matrix” for cycling infrastructure. This acknowledges that place has an impact on road user behaviour and equally the construction of the street has an impact on the sense of place.



Figure 6 Place Matrix TfL

In the context of a Main Street it is likely that even at low speeds motor traffic volumes will dictate a need to accommodate cycling in a secondary position outside of the main traffic flow. This may create a requirement to introduce light segregation<sup>6</sup> measures to prevent space being obstructed by parked cars.

As Main Street emerges into a Town Square, where car parking would be managed differently, the need for light segregation might disappear.

## 4.4 “Secondary” Streets

Masterplanning practice dating to before the introduction of Manual for Streets used Secondary Streets as part of a hierarchical street pattern to deliver motor traffic from primary streets into cul-de-sacs and tertiary streets. Even though MfS has been in place for ten years it is common to see secondary streets identified with little thought as to how these will work for cycling.

<sup>6</sup> See London Cycle Design Standards



If designers follow Manual for Streets this category of street is unlikely to be required. Higher traffic residential streets can cause particular problems in designing for active travel. For streets carrying motor traffic in the range 3,000 to 5,000 vehicles:

- A comfortable design solution for cycling will appear to result in “over engineering”.
- Crossing the road becomes uncomfortable for pedestrians
- Junctions with Main Street are problematic

Replacing streets which begin to fall into this category with multiple access streets serving the same purpose may provide a solution.

## 4.5 Cycle Streets

A cycle street is a street so designed that cyclists dominate visually and motorized traffic is tolerated as a guest. They look like a street-wide cycle track on which motorized traffic is allowed. Legally, a cycle street is a mixed traffic road.<sup>7</sup>

Cycle Streets are an essential tool in delivering a network that runs into the heart of housing estates cost effectively. Their use allows a complete high capacity active travel network whilst still being able to lay out an estate efficiently and provide residents with the ability to store a motor vehicle close to each dwelling.

Cycle Streets often require footways and parking bays, so are more expensive than private shared drives / courts but comparable in cost to a conventional tertiary street. A complex set of design requirements means that more design time and specialist engineering expertise is required that will result in higher design costs.

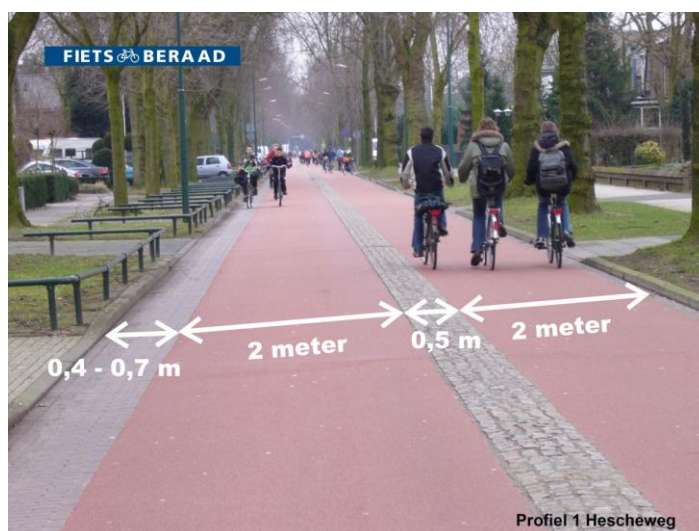


Figure 7 Cycle Street (Fietsberaad)

<sup>7</sup> Presto Fact Sheet: Cycle Streets [https://ec.europa.eu/energy/intelligent/.../sites/.../presto\\_fact\\_sheet\\_cycle\\_streets\\_en.pdf](https://ec.europa.eu/energy/intelligent/.../sites/.../presto_fact_sheet_cycle_streets_en.pdf)

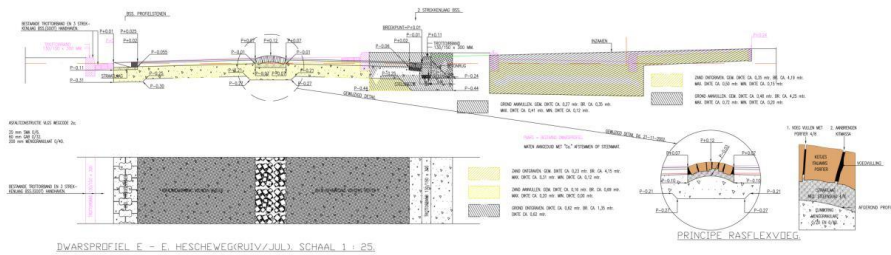


Figure 8 Cycle Street Construction Details (Fietsberaad)

It is important that designers are aware that not every tertiary street in a development can or should be a Cycle Street. A Cycle Street is not a home zone, being designed for movement, albeit walking and cycling.

## 4.6 Traffic Free

Traffic free paths should be designed as “streets” with the same attention to detail and relationship to surrounding buildings as for a street carrying motor traffic.

- In an urban context traffic free paths will offer over 4 metres of usable width, they can have a significant impact on landscape & housing layout.
- Lighting columns are required along with winter maintenance to ensure paths are usable at all times of the day and year.
- Traffic free paths are best used as short sections / links.
- Paths through parks and green space will attract users, but not every green space can or should accommodate a route for movement.
- Wide well-lit urban paths are expensive particularly in terms of space – if designers rely too heavily on this single type of infrastructure, network density & quality may suffer

## 4.7 Shared Pedestrian & Cycle Surfaces

The decision on whether it is appropriate to mix pedestrians and cycles on streets, paths or tracks depends on a number of factors including the number of users and the context. The existing highway network provides many examples of shared arrangements that are less than ideal, but some work well.

It is never appropriate to mix pedestrians and cycles along an active frontage within a new development.

A shared use path is two-way for cycling, which requires more space at junctions than a unidirectional track. A shared use path that gives way at minor roads offers a poor user experience and should not form part of a Garden Village or Town active travel network.

On a street designed for movement with an active building line, separate cycle tracks will be required.

On streets with a high place and recreation function such as town centres it may be appropriate to run a secondary cycle route through an area with very high pedestrian footfall. In this situation zones along the frontage of buildings should be delineated for pedestrians only. A central delineated area or “shared space” may be defined where cycles and sometimes some motor traffic are allowed within a pedestrian priority zone.



*Figure 9 Pedestrian Priority Area, with cycling and delivery vehicles in a central delineated zone, Newcastle*

Away from building frontages a sensible approach is to provide more than the minimum width first, and then take decisions on how to share. In areas where user types fluctuate at different times of the day a single flush surface with indicative changes in surface materials can be a good solution to maximise capacity but reduce conflict.





Figure 10 Path near a secondary school, single surface with indicative change in materials (Sustrans)

Through parkland creating a single wide surface similar to a country lane may be appropriate. There is an established etiquette between pedestrians and cycle traffic which can deal with conflict in this context, provided that width is generous i.e. comfortably over 4 metres. However as the volume of users rises this will become more problematic.

## 4.8 The Grid

Continental network design practice takes the concept of a 250 metre grid and further subdivides this into primary (city) and secondary (district) routes. Primary routes (red) are spaced at 500 metre intervals, secondary (blue) at 250 metre intervals.

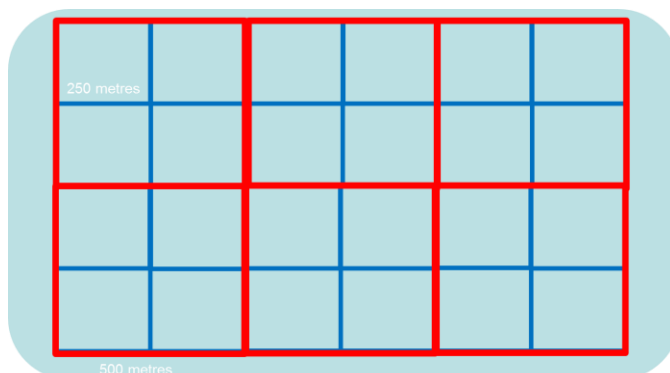


Figure 11 The Grid



This concept should be used with care, primary and secondary routes should have uniform quality. In some cases a secondary route connecting into a key destination such as a rail station might be wider than it's adjacent primary route.

Where the concept of primary and secondary routes becomes useful is when considering:

- Natural & man made barriers
- Deviation

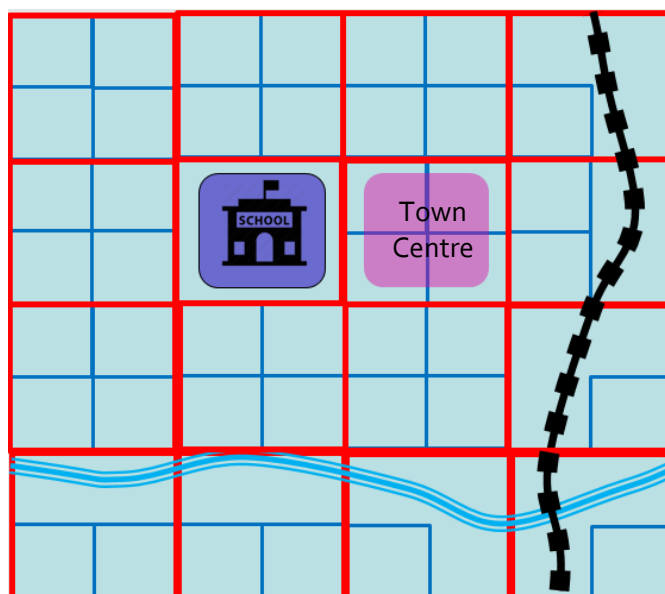


Figure 12 Primary and Secondary Active Travel Routes (Motor traffic routes not shown).

Primary routes must cross barriers such as rivers, rail lines and trunk roads, but will pass either side impermeable uses such as schools.

Where a town centre is a pedestrian priority zone then primary cycle routes will ideally pass either side or through the fringe of a town centre, with secondary routes passing through the centre.

In smaller settlements where a the town centre is organised around a movement route then a primary cycle routes would also pass through the centre.

## 4.9 Deviation Factor (Welsh Guidance)

Deviation should be tested for Primary Routes to key destinations. To allow for deviation outside a development, primary routes within often need to be very, very direct.

Distance	Routes should follow the shortest option available and be as near to the 'asthe-crow-flies' distance as possible.	4.Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative.		Deviation factor against straight line or shortest road alternative >1.4	Deviation factor against straight line or shortest road alternative 1.2 – 1.4	Deviation factor against straight line or shortest road alternative <1.2
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Figure 13 Welsh Active Travel Act - Guidance

Secondary routes can follow landscape features & drainage patterns, primary routes sometimes can't. The Grid does not need to have a regular shape or pattern.

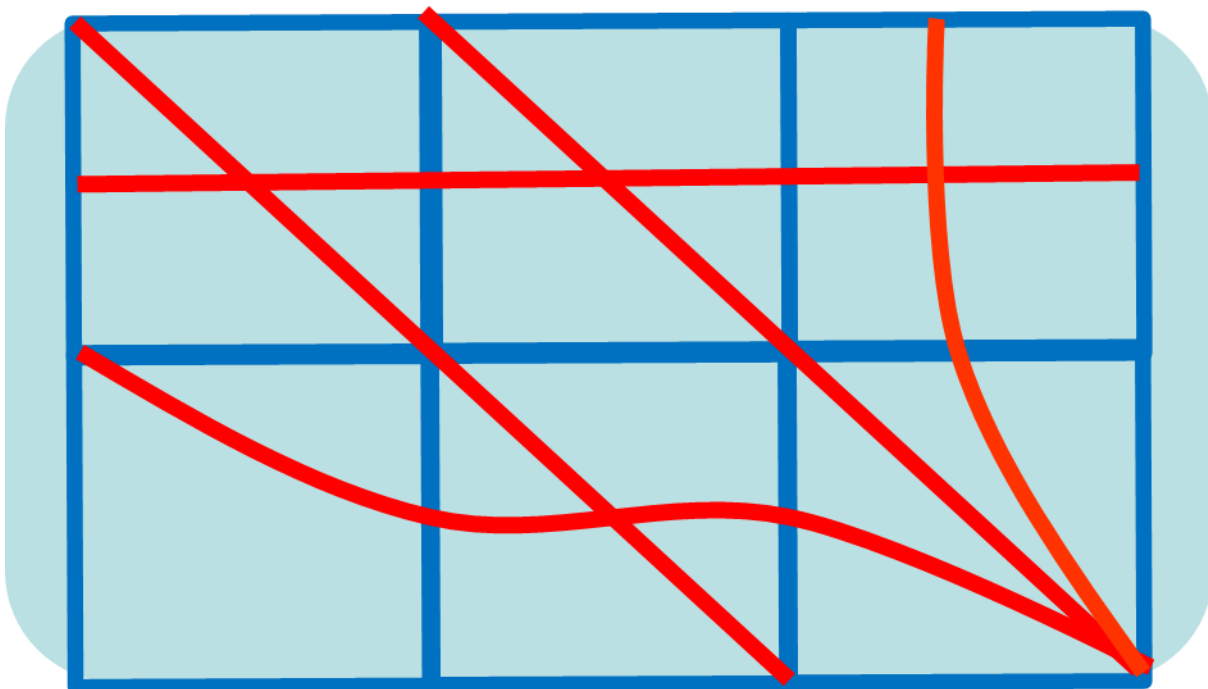
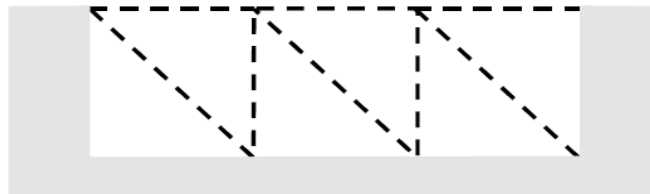


Figure 14 irregular grid, primary routes aimed at key trip generators, secondary routes following landscape

## 4.10 Implications for Street Widths

An urbanist street pattern, following Manual for Streets makes life easier in designing a network, but sometimes harder in getting the detail right. There are design challenges associated with:

- Side Roads
- Frontage Access
- Street Widths



1:3 ratio is generally effective.

Figure 15 Height to width guidance, MfS

Providing for walking and cycling within principal streets can present challenges in ensuring a good building height to width ratio.

Sustainable Urban Drainage systems can compete for width with Sustainable Transport Infrastructure.

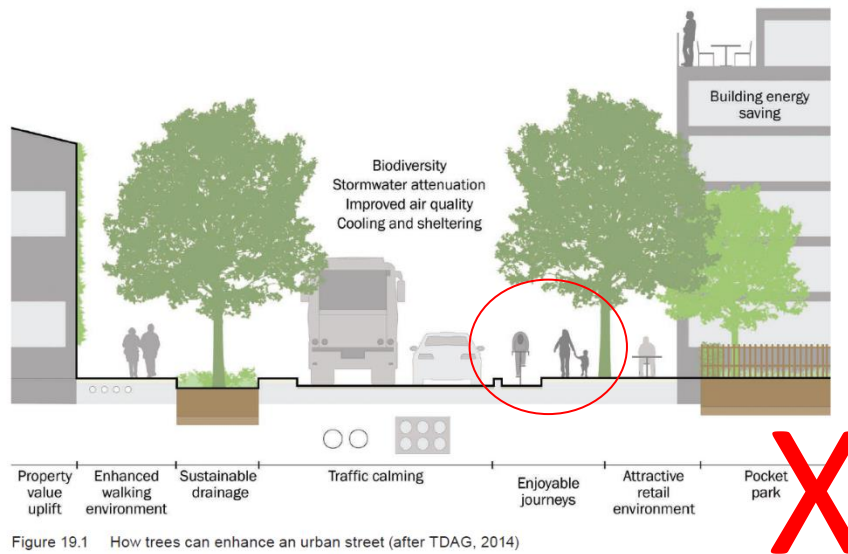


Figure 19.1 How trees can enhance an urban street (after TDAG, 2014)

Figure 16 Example Street Profile with *insufficient width* for walking and cycling CIRIA

(the profile also implies a narrow vertical upstand between cycle track and carriageway which can be problematic)

Attempting to create a principal street less than 20 metres wide with SUDS taking up some of the street width can leave designers tempted to relegate cycling to a shared use arrangement.

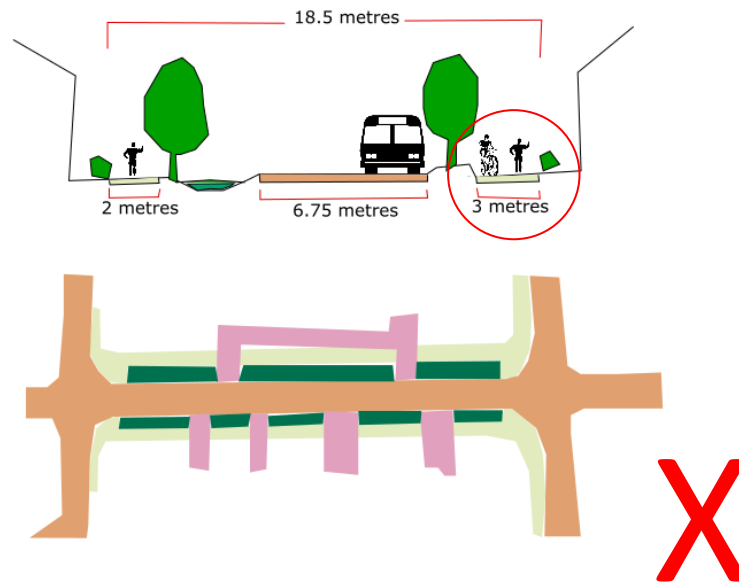


Figure 17 Example profile which uses an **unworkable** solution for walking and cycling, sharing a path across an active frontage with inadequate space to deal with side roads, driveways are shown breaking continuity.

Designers must recognise that there will not always be width in the street to provide everything that they might want to see. However, compromising on the design quality for active travel should not be an option.

With a street pattern based on Manual for Streets principles, shared use paths will not be appropriate. Designers will need to confront the technical challenges of building cycle tracks with priority over minor roads and accesses in a complex urban environment.

Main Street will need sufficient width to provide high quality facilities for walking and cycling, this may imply a narrower main carriageway.

Where width is not an issue then slip or service roads configured as cycle streets make a good alternative to cycle tracks.

## 4.11 Transit Integration

Multi-mode commuting offers established potential for walking and cycling to form part of longer trips as an alternative to car use. Designers should keep in mind that the distances that residents will walk or cycle to a transport hub for a multi-modal trip are much less than would be applicable for a single mode trip.

Typically for commuting trips using light rail users will walk up to 400 metres from home to access a Transit Stop or Station. Use begins to decline at around 300 metres with only smaller numbers of residents being prepared to walk to the service beyond this distance.



Cycling is a popular method of accessing Transit across Northern Europe. When high quality bicycle parking facilities are provided at Transit Stops residents will cycle in significant numbers.

For masterplanning designers should assume that cycle – light rail commuting is viable for distances out to 1.2 km after which usage will decline as multi-mode commuting becomes less efficient. Longer distances will apply for heavy rail.

## 4.12 The transport chain

Evaluation<sup>8</sup> of first 250 metre spaced fine mesh network in Delft looked not just at the quality of cycling infrastructure but also at the overall “transport chain” experienced by the public. The evaluation concluded that people’s familiarity with facilities at destinations is a major factor in the decision on whether or not to cycle.

For a new Garden Community, the implications are that cycle parking and storage at both homes and destinations must be well located and constructed to sufficient capacity to cope with demand. The Settlement Travel Plan must ensure that information on cycle parking facilities is provided in a clear and comprehensive manner to new residents and reinforced by visible well signed facilities. Facilities must be monitored as part of the travel plan and remedial action taken when they are found to be under or over used.

Cambridge City Council publishes an excellent guide<sup>9</sup> to cycle parking standards in new developments.

## 4.13 The role of a Community Trust

Garden Communities differ from conventional housing estates in that it is envisaged that a Community Trust will be endowed with assets created by the development and take on some aspects of ongoing management.

It is common practice for residential travel plans to assume that responsibility for administering the plan will pass to the community within 3-5 years for initiation. A community trust may provide a much more robust long term vehicle for continuing the travel plan.

It is also possible that a community trust might take on the maintenance of some paths and streets within a development. Winter maintenance is particularly important for traffic free walking and cycling infrastructure. In establishing a long term maintenance regime for the Garden Village consideration should be given to equipping the community trust with plant for winter maintenance to allow it to maintain active travel as a viable option twelve months of the year.

<sup>8</sup> Ruimte voor de fiets 1994 Netherlands Ministry of Transport

<sup>9</sup> Cycle Parking Guide for New Developments

[https://www.cambridge.gov.uk/sites/default/files/docs/CycleParkingGuide\\_std.pdf](https://www.cambridge.gov.uk/sites/default/files/docs/CycleParkingGuide_std.pdf)



Figure 18 Multihog Winter Maintenance similar to that in use on Cambridge Guided Busway



Figure 19 Newcastle Airport Multihog (Summer)

## 4.14 Leadership & Governance

Delivering a high active travel mode share New Town or Garden Village will require strong political leadership, embedded in the corporate strategy of the chosen delivery vehicle.

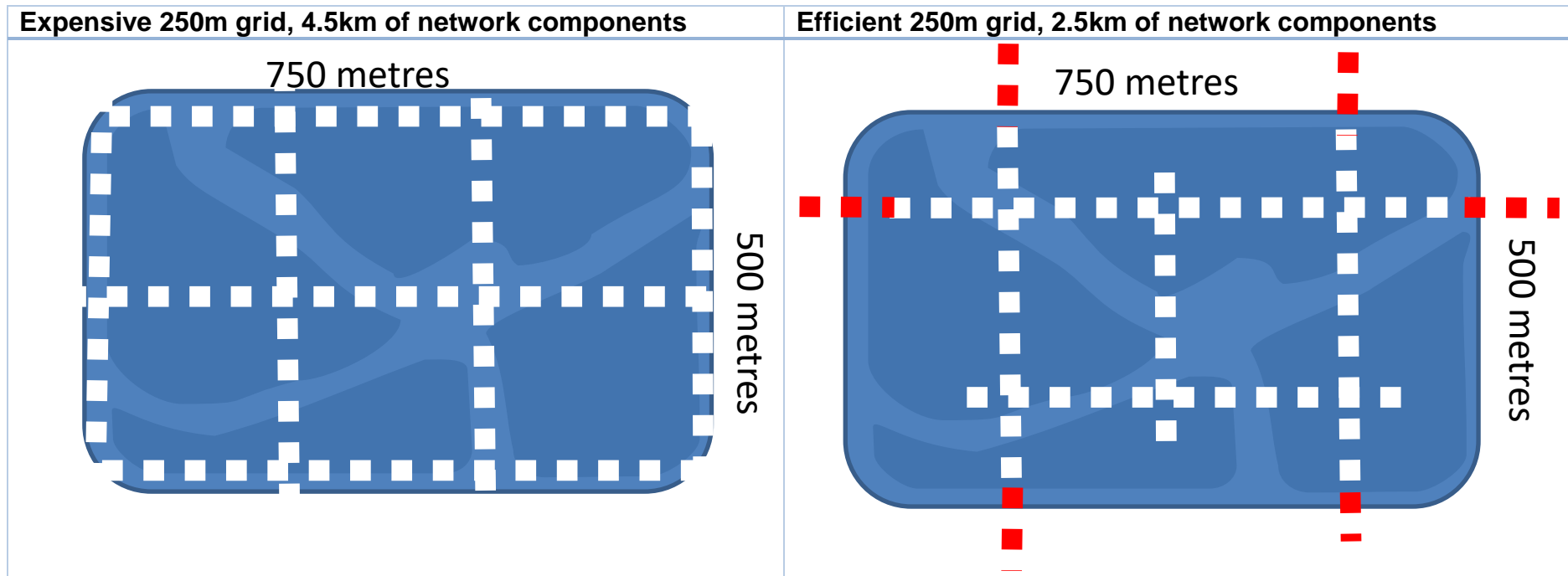
TCPA Practical Guide 2 sets out how these wider principles might work in relation to different methods of delivery. The delivery team leading the development of the settlement will need to be prepared to set out the moral and the scientific case for why development must be engineered to prioritise walking and cycling.

A strong communication strategy is vital in building public understanding and enthusiasm for new ways of moving around their community.

## 5 The theoretical 40 Ha Neighbourhood

Consider a theoretical dense neighbourhood constructed over 40 Hectares, with schools external to the site, providing 1200 dwellings. The development might generate up to 6,500 car trips per day.

Locating walking and cycling routes at the edge of development is significantly less efficient in creating a 250 metre grid. Although building through the heart of housing cells may be more expensive per linear metre, the length of network needed can be nearly half that for a network which skirts the fringes of development. The more efficient network shown delivers access to the network within 125 metres of all dwellings, connecting to primary routes outside the development.

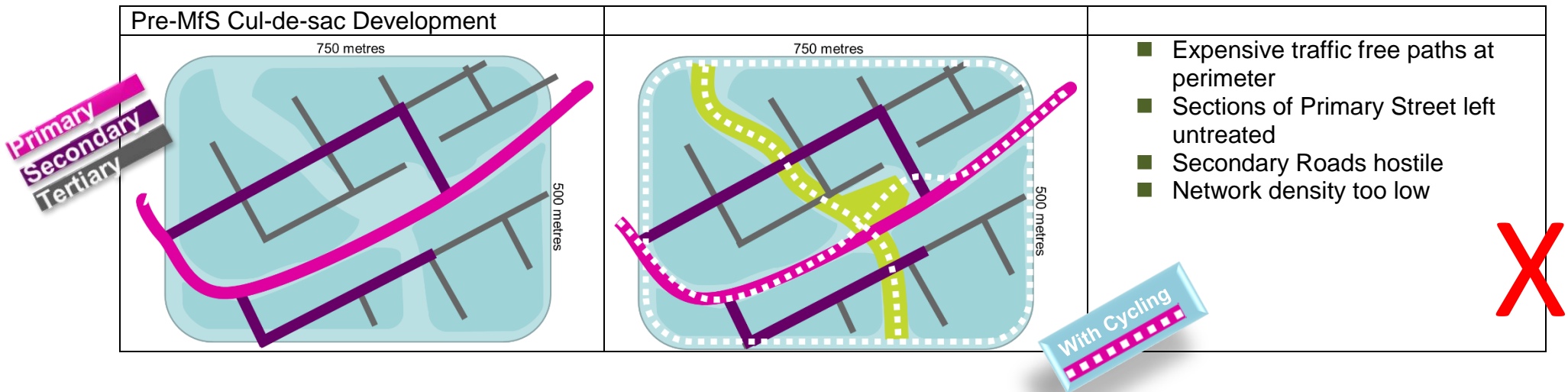


Creating the network through the middle of development does not preclude creating recreational paths at the edges, but they need not be built to the same specification.

The type of street pattern that a network must be constructed alongside and through is a key factor influencing design.

The illustration below demonstrates the problems caused by a hierarchical cul-de-sac based street pattern combined with a single "Greenway". Although in theory made redundant ten years ago with the introduction of MfS this is a pattern still typical of many housing developments in the UK today.

The network density achieved is too low to be effective and many sections of street are left untreated and potentially hostile to walking and cycling. Routing paths around the outside of development is highly inefficient but can be the only option available with this type of layout.





An Urbanist street pattern in keeping with Manual for Streets will create connected streets. Multiple routes through housing cells connecting to the Main Street ensure that traffic volumes are not concentrated on access streets. Permeability within housing cells is regulated by use of filtered permeability, ensuring that routes which might otherwise be attractive to “rat running” motor traffic are permeable only for walking and cycling.

Use of the concept of “Cycle Streets” within this context allows a dense grid of routes to be created without distorting the urban form. A balanced network can be created combining traffic free, cycle streets and cycle tracks along Main Street.

MfS inspired filtered grid		
		<ul style="list-style-type: none"> <li>■ Secondary Streets are not used, only one main street carries &gt; 1,000 vehicles per day</li> <li>■ Part of a wider network of connected streets, filtered to prioritise sustainable modes</li> <li>■ Easy &amp; Cost Effective (If you use Cycle Streets)</li> </ul>

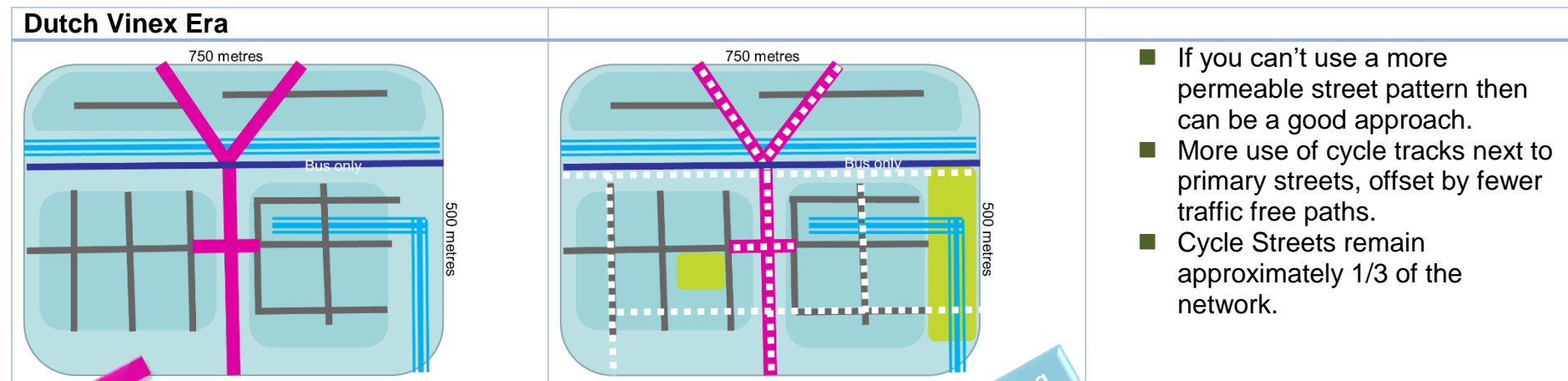


In situations where a permeable Manual for Streets layout is not possible then Dutch network patterns may offer a good solution. Dutch housing policy from 1995 to 2005 was governed by the Vinex Plan which set out how 455,000 new houses would be built. The same period coincided with changes to traffic regulations in the Netherlands which introduced the concept of “Sustainable Safety”.

The Dutch Vinex Era settlements typically have significantly wider and more numerous water courses within their boundaries than would the case in other countries, this impacts on permeability. Traffic regulations in the Netherlands affect the design of Main Streets such that fewer side road connections are seen as desirable than would be the case under UK MfS.

When designing in a municipality which is reluctant to accept multiple accesses and side roads along busier streets, the Dutch Vinex Era model can offer a good solution. The same may also be true where geographical features restrict permeability. This approach implies use of longer sections of “Primary” streets which may well have cost implications.

“Secondary” or “Grey” Streets, where movement and recreation functions are mixed, are not acceptable under Dutch traffic regulations which represents a key difference to the common UK equivalent.



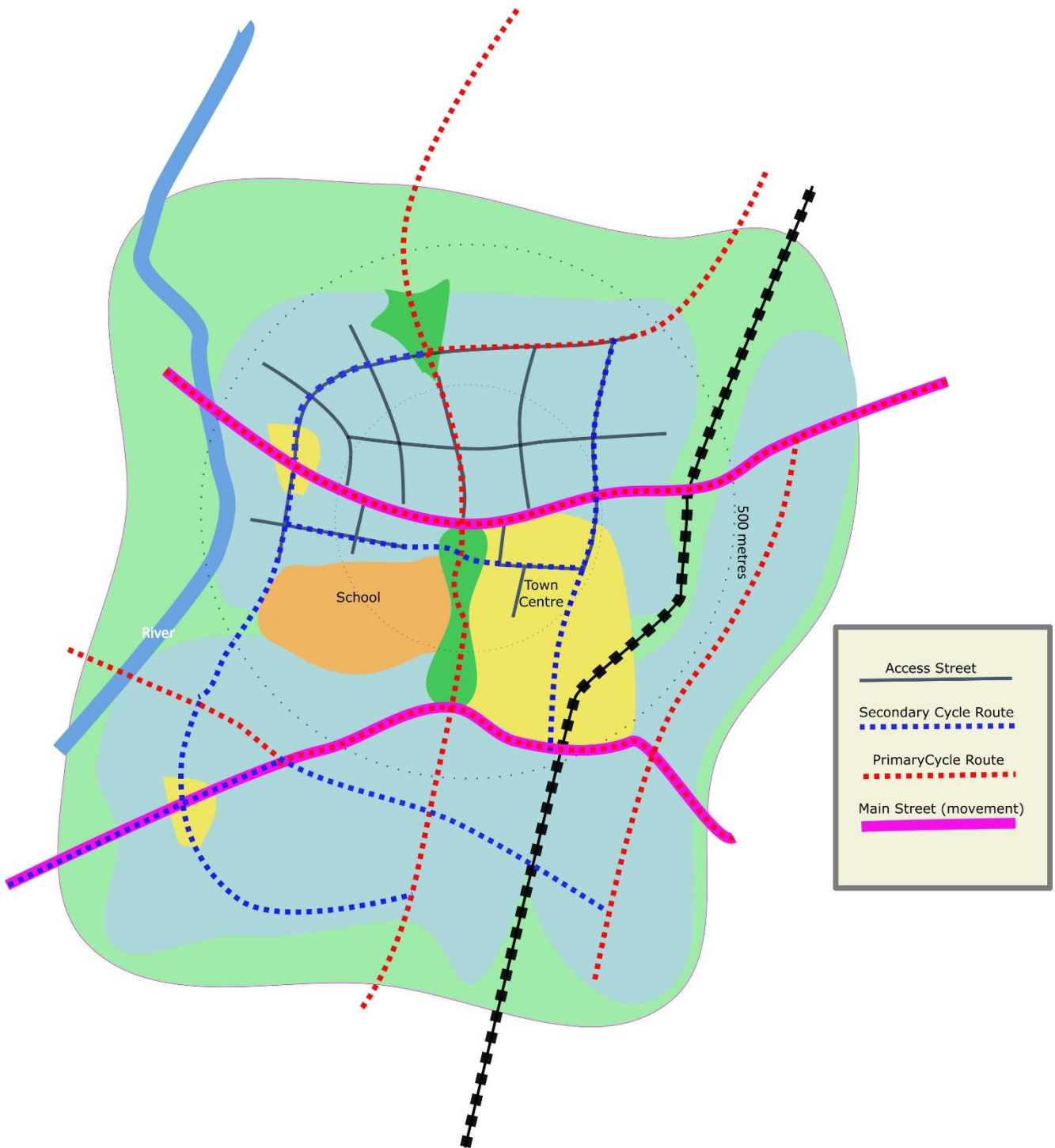
Primary  
Secondary  
Tertiary

With Cycling



In context, the theoretical 40ha neighbourhood sitting to north of town centre and school site, primary and secondary cycle networks identified. Larger neighbourhoods have their own defined centres, whilst smaller neighbourhoods are walkable to the town centre.

This example shows a larger settlement with a bicycle permeable pedestrianised core. A smaller settlement might show movement routes for motor traffic (pink) and primary cycle routes (dashed red) running through the town centre.



Pedestrianised or “low-traffic” town centres will be viable at different levels in different regional contexts. It is not the purpose of this document to arrive at a definitive recommendation on whether Main Streets should pass through or around a town centre.

In 1993 Carmen Hass-Klau looked at the impact of pedestrianisation and “traffic calming in Germany<sup>10</sup> and the UK. It is important to note that Hass-Klau uses the term “traffic calming” to refer to traffic reduction schemes similar to the Dutch concept of “low car” streets or some UK city centre areas such as Newcastle’s Grainger Town.

“There is generally a positive effect on retailing, with shops inside pedestrian areas being more successful than those outside.... More extensive schemes have more substantial positive effects. However, there can be a reduction in turnover during a transition period of 1-2 years, and the effects can be unfavourable for fringe shops just outside the developed area, unless the scheme is carefully designed.”

It is important to note that this research looked at larger towns and cities, significantly larger than the majority of the new Garden Villages and Towns envisaged in the UK. Many of the Garden Villages proposed for the UK will be too small to support a traffic free retail core but this should be considered for centres with a catchment over 10,000 people.

The removal of long distance through traffic is more easily assessed and has been the subject of numerous international studies. In 1998 the Wisconsin Department for Transport looked at the impact of 17 bypass schemes<sup>11</sup> implemented since 1980. They concluded that although smaller communities may have suffered some adverse economic impact, communities with a population of over 2000 people found a bypass had a positive impact on the local economy.

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<sup>10</sup> <http://publiekeruimte.info/Data/Documents/rc5abtiq/39/Pedestrianization---retailing.pdf>

<sup>11</sup> <https://planningtools.transportation.org/files/16.pdf>



# 6 Case Study: Northstowe Phase 2 Principal Streets

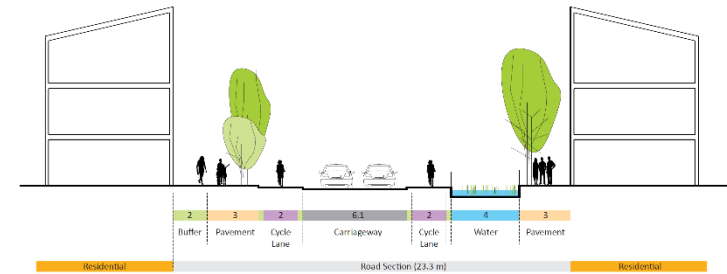
Northstowe is a proposed Garden Town located North of Cambridge. The Phase 2 masterplan was commissioned by the Homes & Communities Agency. Principal Street Cross Sections show two metre wide cycle tracks on each side of the street. Tracks are unidirectional and are treated as part of the carriageway.

The small upstand between carriageway and cycle track may be implemented with a chamfered “Cambridge” kerb in line with retrofit cycle tracks being installed in Cambridgeshire.

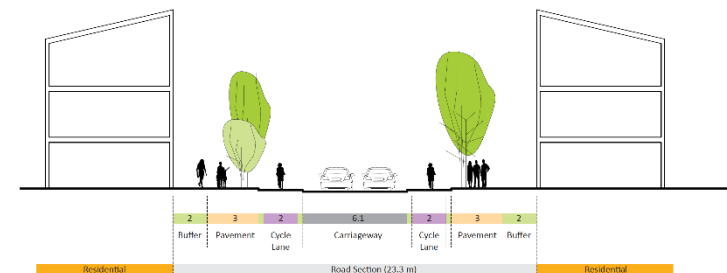


Figure 20 Unidirectional Cycle Tracks under construction, Cambridge 2016

**PRIMARY ROAD - SECTION TYPE PR-1**  
Vehicular traffic  
Dedicated cycle lane (separate lanes)  
Engineered swale  
WIDTH 23.30m



**PRIMARY ROAD - SECTION TYPE PR-2**  
Vehicular traffic  
Dedicated cycle lane (separate lanes)  
WIDTH 23.30m



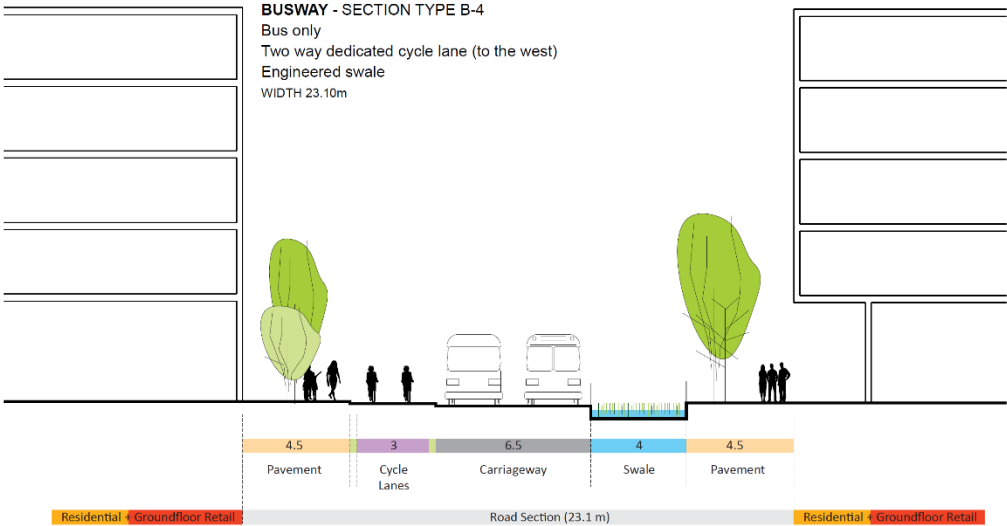
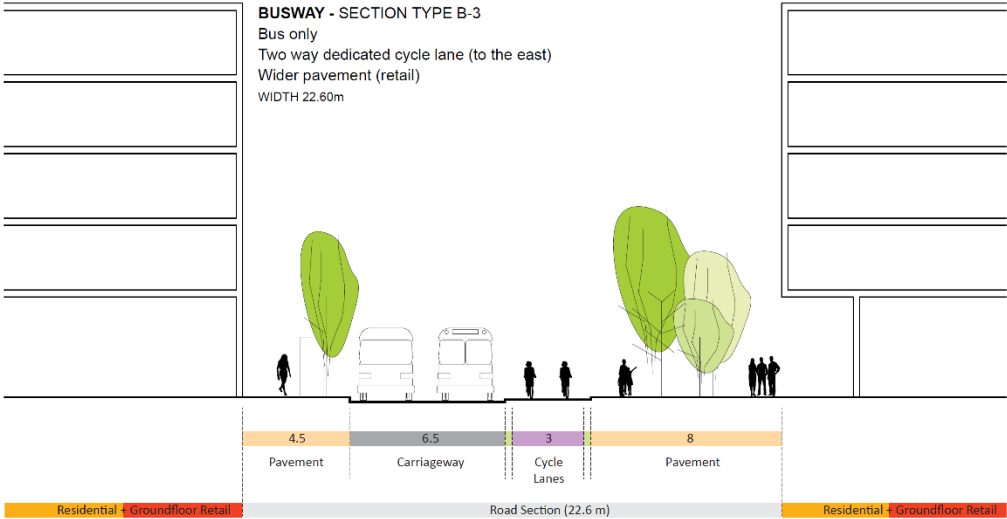
Northstowe Phase 2 includes sections of principal street which will be bus only. On these streets provision is proposed as a 3 metre wide cycle track on one side of the carriageway.

Provision on only one side is less idea for cycling but the lower traffic volume on a bus only route should make crossing the carriageway relatively easy.

Cycle Parking will be provided throughout the development to high ratios and also at bus stops to allow interchange to the guided busway to Cambridge.

CYCLING PARKING PROVISION		
Land Use	Units	Standard
Residential	3500 units	Minimum 1 secure cycle space to be provided, within the curtilage where possible.
Primary School	Each 420 pupils	Secure cycle parking at a rate of 30% for pupils over 5 years of age
Secondary School	1250 pupils	Secure cycle parking at a rate of 60% for pupils over 12 years of age
Town Centre	57,500 sqm	1 secure cycle space per 25sqm (retail standard). Assume 50% of trips are linked across town centre uses.
B1 employment	16200 sqm	1 secure cycle space per 30sqm gross floor area.

Figure 21 Northstowe Cycle Parking Ratios



## 7 Case Study: Dissington Garden Village

Dissington Garden Village is an evolving masterplan for a Garden Village located on the Dissington Estate, North West of Ponteland, Northumberland.

The proposed Garden Village will create clusters of housing interspersed with green space to create a new garden village concept, based on village precedents from the local area. The village is planned as a mixed use settlement with a high level of affordable housing.

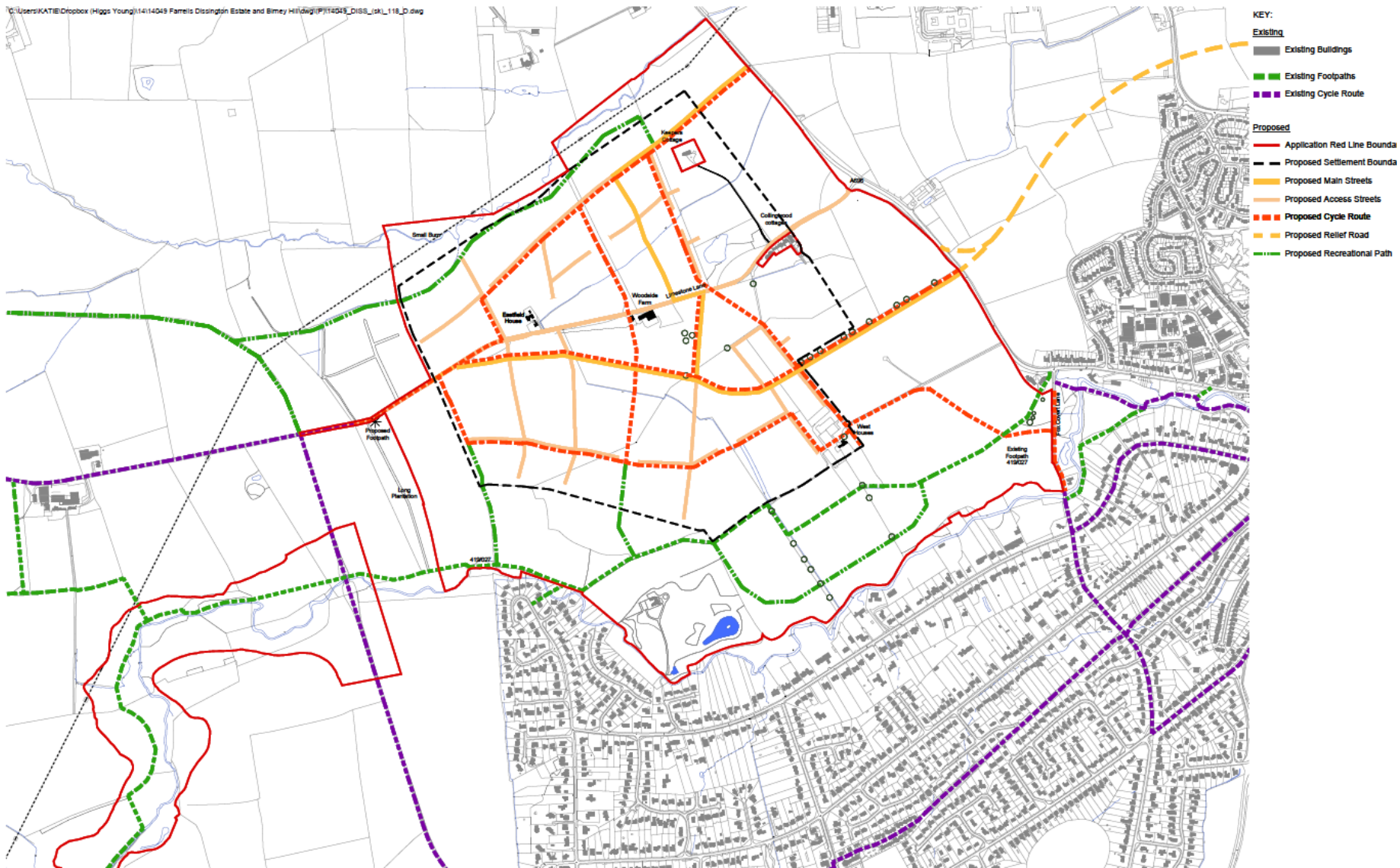
- Residential up to 2,000 residential units (Use class C3)
  - Up to 30% affordable housing (up to 600 units)
  - Range of Use Class C3 property sizes (2 – 6 bedrooms)
  - Up to 90 units use class C2 (residential institutions)
  - Range of densities: From 20 - 45 dwellings per hectare (net developable area)
- Commercial uses up to 2,500 sqm Use Class A1
  - Use Class A1 restricted to maximum single unit size of 750 sqm GIA
- Up to 3,000 sqm Use Classes A2, A3, A4, A5 (total)
  - Single units restricted to maximum GIA of 750 sqm
- Up to 8,000sqm Use Class B1
  - B1a – Up to 5,600 sqm
  - B1b – Up to 1,200 sqm
  - B1c – Up to 1,200 sqm
- Use Class C1 (Hotels/guesthouses) – Up to 80 bedrooms total
  - Maximum of 20 bedrooms in any single unit
- Sui-generis (agriculture) – up to 3,000 sqm including poly-tunnels/glasshouses
- Use Class D1 (nursery, school, clinics etc)
  - Up to 3,500sqm (including 1,400sqm primary school)
- Use Class D2 (indoor sports and recreations etc)
  - Up to 2,000sqm

The new village will be designed as a walkable settlement but has a very strong focus on cycling as it will share some shops, services and a secondary school with the neighbouring settlements of Ponteland & Darras Hall. Secondary school pupils living in the new village will typically live 2 to 3 kilometres from a new secondary school constructed adjacent to NCN10.

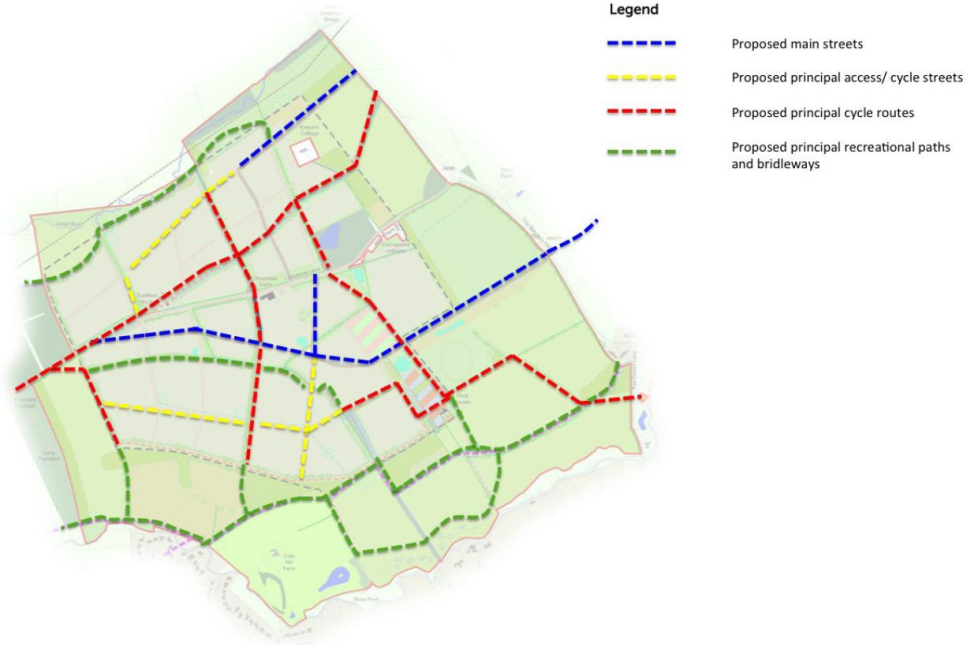
Application for Outline planning consent was submitted December 2016, the following pages show extracts from illustrative sections of the Design & Access Statement accompanying that application. The document is unique in the UK in it's commitment to delivering a 250 metre mesh Active Travel Network and the strong emphasis on the use of Cycle Streets as a component of this network. Not all cycle routes are shown as yet on the masterplan, but a dense grid is already visible.







**Sustainable transport corridors:**



The network of sustainable infrastructure throughout the Dissington Garden Village creates an opportunity to develop a proposal that quickly becomes a model of sustainable living. Its importance in the overall masterplan cannot therefore be overstated. A network of multi modal main streets, access or cycle streets, play streets and homezone mean that this would quickly become a development like no other. The main principle being that by providing safe

and accessible routes to shops, schools, business and open space and of course to the established infrastructure within Ponteland Town Centre and on the Darras Hall estate encouraging less reliance on the motor car. This will ensure a shift toward a healthier lifestyle, which would include, walking, running, cycling and riding and where motorised transport is required, the capacity and flexibility to use bus services that are to be introduced as part of this proposal.



Example of main street



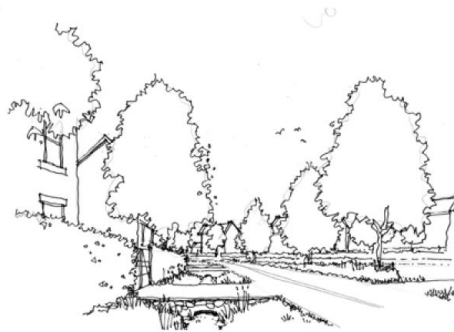
Example of cycle street



Example of recreational route



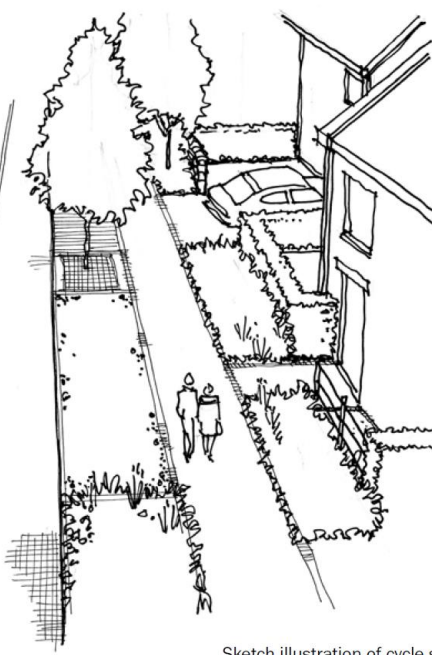
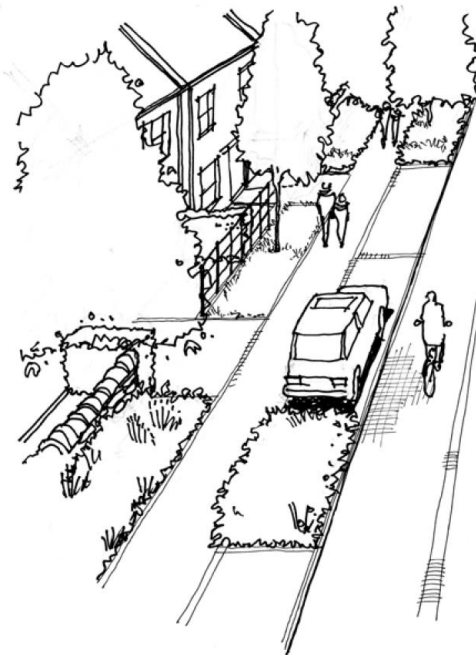
- The masterplan affords significant opportunity for landscape treatments to influence the design of these sustainable links in such a way as to create a variety of visual experiences throughout the development, each experience having a character of its own (such as where established trees and hedgerow are to be retained, and each inferring a hierarchy in terms of pedestrian and vehicle priority).
- A comprehensive network of additional footpaths and cycle paths would be proposed throughout the masterplan area, linking development parcels with open space and beyond where practicable into the wider Ponteland and Darras Hall area. The landscape treatment of these links will consider planting, verges, swales, set back distances from roads and incidental play or open space as appropriate to each location.
- The detailing of footpaths and cycle paths will be appropriate to the location and the individual character area through which it passes, so as to maintain sense of place and to limit an urbanisation of the open landscape areas proposed. Seating and sign posting will be considered as appropriate.



Sketch illustration of main street



Sketch illustration of home zone



Sketch illustration of cycle street

FARRELLS

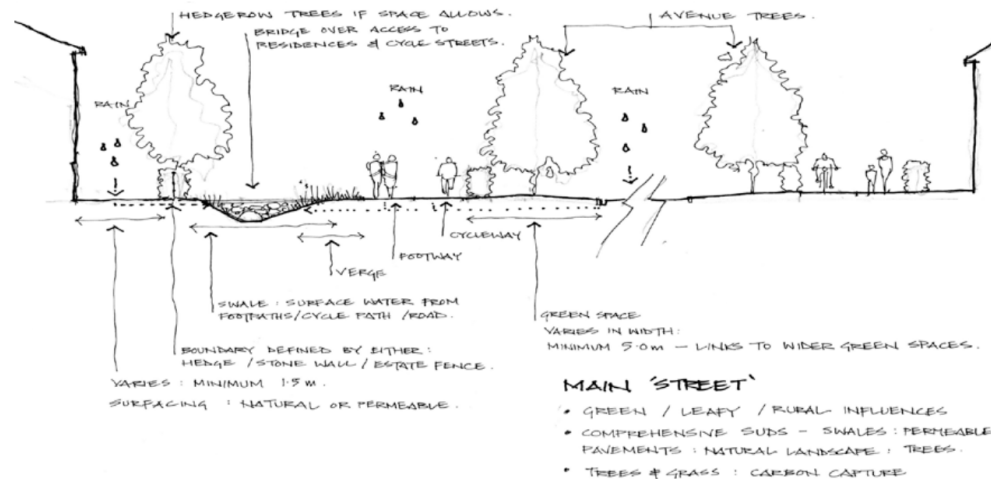
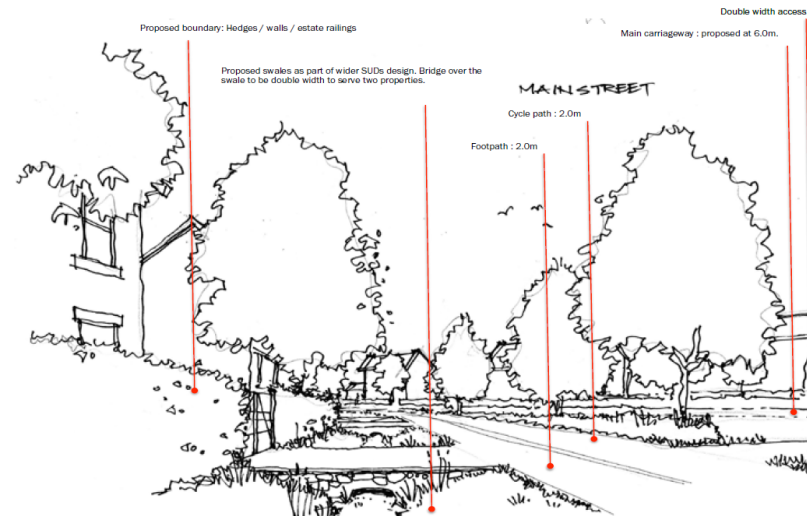
PlaceOnEarth Landscape Design  
glenkemp  
LANDSCAPE ARCHITECTS

95

## 5.4 Connectivity Main Streets

The Main or Principal Streets in the development carry a higher volume of motor traffic and in most cases provide a bus route or routes through the residential development. The Main Street should be designed with Cycle Tracks & Footways on both sides of the carriageway.

- Segregated space for walking and cycling takes more width than that for buses and cars.
- Provide for cycling on both sides (mix of 2 Way & Unidirectional depending on desire lines).
- Area for green space &/or SUDS.
- Multifunctional verge or flexible strip can be necessary in order to accommodate car parking and bus stops.
- The width and space referring to streets of this type means that they have to be used frugally within a Garden City, Town or Village.





## Street character

A hierarchy of street character and access creates a gradual hierarchy of street width, frontage, building scale and landscape detail to establish the primary road, secondary access streets, lanes fronting the wider green open spaces and a loose network of tertiary perimeter green lanes, and short cul-de-sacs linked by paths.

- A loose network of secondary, tertiary streets lanes and paths to create connected neighbourhoods with housing fronting both sides of the street.
- Tertiary streets link together to create either dual frontage streets or short cul-de-sacs linked by pedestrian cycle routes.
- Housing fronts onto perimeter green streets from tertiary lanes, which have a limited number of homes, to reduce scale. They are linked by pedestrian and cycle paths.
- Housing fronts onto primary streets by using tertiary lanes with a limited number of homes linked by pedestrian cycle paths.
- Mews courts accommodate some rear parking; however mews have homes above garages to provide natural surveillance.
- Layouts take into account slopes and topography with a Suds drainage strategy to use streets and lanes in the direction of the slope as conveyance swale. Green perimeter or central breaks between blocks act as collection swales.

- The varied combination of slopes and green spaces introduced as swales, curved streets to accommodate either of the above, or orientation of solar PV or perimeter hedgerows provide many variations of spaces within a reasonable framework principle.
- Fragmentation of block edges on the perimeter, varied field boundaries and specific topographic or physical features such as groups of trees or streams is actively encouraged, provided that the core principles of layout are met.



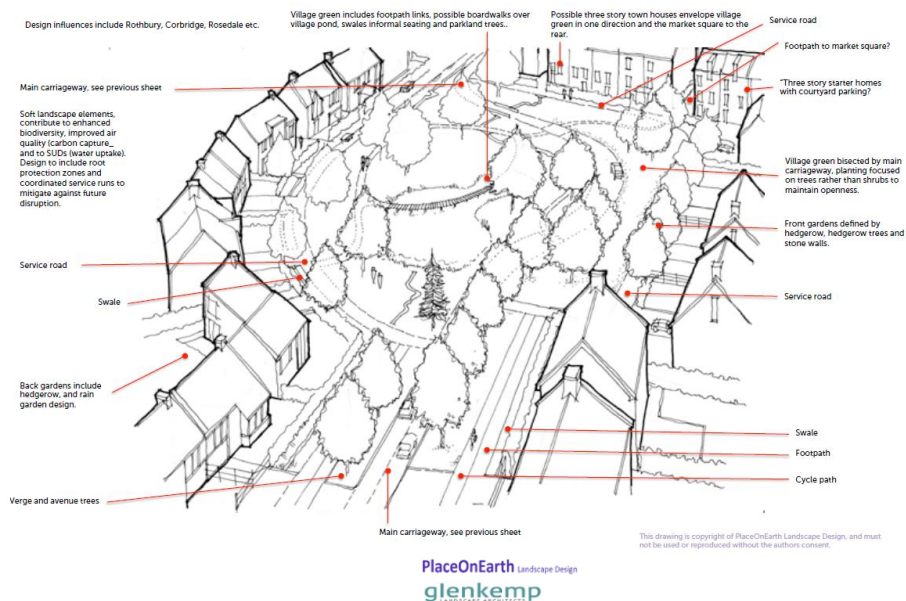
Proposed sketch views



Proposed sketch views

## Sustainable Access Principles

- Must be a main cycling route through residential areas where car traffic is low and cycle traffic is high (see below).
- Convenient and direct route between key destinations
- Cyclists should have priority on the road itself but also right of way at junctions to increase convenience; the street must be physically recognisable, including from side roads
- Addresses real and perceived conflict issues between cycles and motor vehicles
- Design should encourage cyclists to adopt the primary riding position or ride two abreast, with drivers of motor vehicles behaving as 'guests'
- Available width should discourage drivers from overtaking
- The street can be one or two way for motor traffic
- Traffic speeds to be low – generally below 20mph
- Minimise nuisance caused by parked vehicles
- Where parking / loading is permitted, the design should take account of variation in use of the kerbside space throughout the day and the effect on user behaviour at times when parking / loading space is unoccupied
- Design should include public realm improvements
- Take account of any local concerns that may be addressed by the scheme



Proposed sketch views



## Cycle Streets

A cycle street is a road designed so that cyclists dominate visually and motorized traffic is tolerated as a guest. They look like street-wide cycle tracks on which motorized traffic is allowed. Legally, a cycle street is a mixed traffic road. Cycle Streets are an essential tool in delivering a network that runs into the heart of housing estates cost effectively. Their use allows a complete high capacity active travel network whilst still being able to lay out an estate efficiently and provide residents with the ability to store a motor vehicle close to each dwelling. Cycle Streets require footways and parking bays, so are more expensive than private shared drives / courts but comparable in cost to a conventional tertiary street. A complex set of design requirements means that more design time and specialist engineering expertise is required that will result in higher design costs.

## 250m Grid

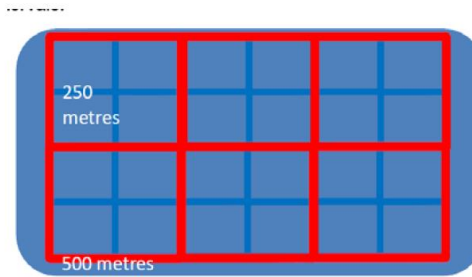
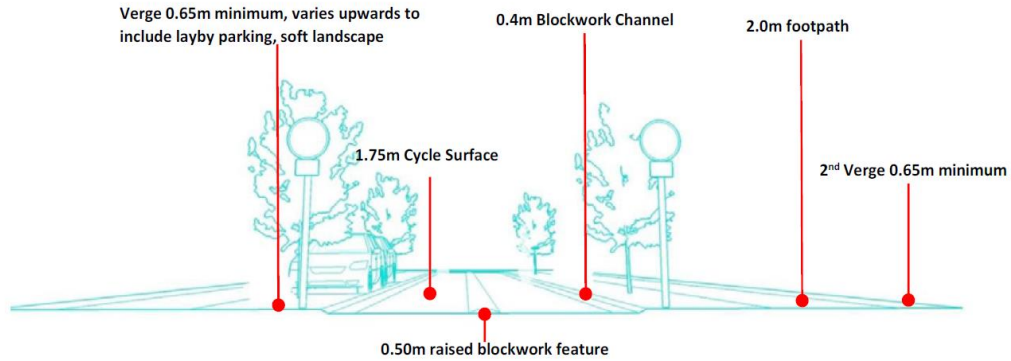
The Garden Village Cycle network will be designed based on a 250 metre mesh comprising primary and secondary routes. Creating a safe environment where children can move freely and independently on all routes.

A 250 metre mesh is specified for cycling networks and reflects a key objective that no resident should live more than 125 metres from the cycle network. By this we mean a grid of paths and streets where surfacing, directness, legibility, & junction design are optimised for safe and efficient active travel.

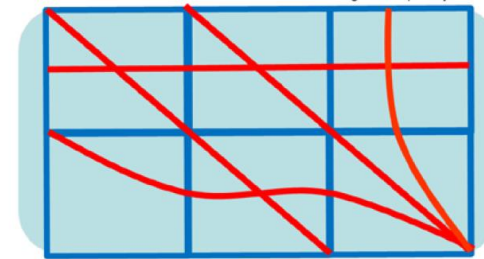
The way that the grid is laid out is key to ensuring that it is affordable across a range of local housing markets. Running grid sections through the middle of neighbourhoods can imply building a shorter network comprised of higher capacity sections and more extensive use of cycle streets.

### Cycle Street – Type 1

The Type 1 Cycle Street will provide part of the bicycle network connecting into the Boulevard. It will offer a ultra-low traffic environment, transitioning to traffic free or Type 2 Cycle Street as it moves further into the development.



Regular 250m grid



irregular grid, primary routes aimed at key trip generators, secondary routes following landscape

## 7.1 Deviation Testing

Deviation testing began in advance of work to look at options for the masterplan area. Journeys were tested against key destinations:

- The Junction of NCN10 with the Newcastle Airport Bridleway. Possible site of light rail station, leisure and secondary school.
- The route to Ponteland Main Street (junction of National Cycle Route 10 – Reivers)

Table 1 Deviation between village centres

Trip	Crow Flies	Actual	Ratio
Distance	3.07 km	3.46 km	1.13
Within Dissington Estate	2.19 km	2.52 km	1.15

Within the masterplan site the need for routes with minimal deviation to connect to route midpoints (bridges) has been factored in. To accommodate a direct route extensive use has been made of cycle streets in order to minimise the impact of a route which does not follow landscape features within the site. Direct routes through the new settlement reduce overall deviation to within acceptable levels.

## 7.2 Public Transport

Public Transport is envisaged as a demand responsive (App enabled) service connecting to neighbouring villages, Metro (Light Rail) and Newcastle. Within the timeframe envisaged for development low emission connected vehicles will become available. Public Transport will be contracted by the Village Community Trust with funding provided from the development offering flexibility on choice of vehicles.

Pick-up points for public transport will be walkable within the village. Vehicles will also be selected with a view to operating comprehensive integration with cycling for multi-mode travel. Cycle rail integration is being pursued by Nexus on the Tyne & Wear system with carriage of cycles as far as Callerton Park which is the natural interchange for Dissington.

Cycle Park & Ride will be relevant to residents of the lower density fringe of Dissington and also to parts of the neighbouring villages where low density makes public transport difficult to deliver. Comprehensive secure cycle parking will be provided at likely interchange points.



## 8 Sources of further information

- Advisory Team for Large Applications (ATLAS)  
<http://www.atlasplanning.com/page/index.cfm>
- Welsh Active Travel Design Guidance <http://gov.wales/docs/det/publications/141209-active-travel-design-guidance-en.pdf>
- Sustrans <http://www.sustrans.org.uk>
- TfL – International Best Practice Infrastructure Study  
<https://tfl.gov.uk/corporate/publications-and-reports/cycling>
- Cyclenation Cycling Environment Assessment Tool <http://ceat.cyclenation.org.uk/>
- Highways England IAN95/16  
<http://www.standardsforhighways.co.uk/ha/standards/ians/pdfs/ian195.pdf>
- Cyclenation “Making Space for Cycling Guide <http://www.makingspaceforcycling.org/>
- House of Lords National Policy for the Built Environment Committee  
<http://www.parliament.uk/built-environment>
- Manual for Streets 2 [www.gov.uk/government/publications/manual-for-streets-2](http://www.gov.uk/government/publications/manual-for-streets-2)
- Design manual for bicycle traffic: CROW-25 (The Netherlands)  
[www.crow.nl/publicaties/design-manual-for-bicycle-traffic](http://www.crow.nl/publicaties/design-manual-for-bicycle-traffic)
- Department for Communities and Local Government  
<https://www.gov.uk/government/organisations/department-for-communities-and-local-government>
- Design Council Cabe <http://www.designcouncil.org.uk/our-work/cabe/>
- Homes and Communities Agency <http://www.homesandcommunities.co.uk/>
- Letchworth Garden City Heritage Foundation <http://www.letchworth.com/heritage-foundation>
- Local Government Association <http://www.local.gov.uk/>
- National Community Land Trust Network <http://www.communitylandtrusts.org.uk/home>
- National Custom & Self Build Association <http://www.nacsba.org.uk/>
- Planning Advisory Service <http://www.pas.gov.uk/>
- Town and Country Planning Association <http://www.tcpa.org.uk/pages/garden-cities.html>
- TCPA New Communities Group <http://communitiesgroup.org.uk/>