Dublin Cycling Campaign,

% Tailor's Hall,

Back Lane,

Dublin 8

COOLMINE-PORTERSTOWN-CLONSILLA-BARBERSTOWN-BLAKESTOWN

21 October 2020

INTRODUCTION

We are writing to you on behalf of the Fingal Cycling Campaign a subgroup of the Dublin Cycling Campaign which has been advocating for improved cycling infrastructure for Dublin for 26 years and a registered charity #20102029. Dublin Cycling Campaign is a member of Cyclist.ie (www.cyclist.ie), the Irish Cycling Advocacy Network, is the network in Ireland of Cycle Campaign, Bike Festival, and Greenway Groups, and is the Irish member of the European Cyclists' Federation (www.ecf.com). Our aim is to make Fingal a safe and friendly place for everyone, of all ages, to cycle and walk. Dublin and Fingal Cycling Campaign welcome Fingal County Council's intent to improve walking and cycling infrastructure

We welcome the DART+ West line improvements which will move Dublin's transport sector to a more sustainable mode of transport in light of the climate emergency. This submission will focus on all level crossings West of Ashtown. There will be similar issues raised from our Ashtown submission. We urge Irish Rail to take into consideration our recommendations as suggested below.

GENERAL COMMENTS

There are pros and cons for use of either an underpass or a bridge. Fingal Cycling Campaign is recommending an underpass where possible. This submission will focus on the following level crossings

Coolmine
Porterstown
Clonsilla
Barberstown
Blakestown

The benefits of an underpass are that it's protected from the elements such as wind and rain and cyclists don't have to deal with an incline to cycle over the royal canal, as they would approaching a bridge. It will be important if the gradient is less than 1:20 (1:5 and even 1:3.5). We have referenced both the Irish guidelines which are limited in their scope for design standards in APPENDIX I and Dutch design standards which have more comprehensive examples in dealing with similar complex junctions in APPENDIX II. We would recommend Irish Rail consider the best practice and design standards from the Netherlands - the leaders in cycling infrastructure design. There are some common questions across all these bridges in

that are the cycle paths shared spaces with pedestrians or segregated? We would prefer segregated to avoid collisions.

The main issues with design of tunnels/underpass and bridges for cyclists and pedestrians are

1. Lighting
2. gradients (<1:20)
3. Safety (especially at night time for women)
4. Line of sight
5. Segregation
6. Noise
7. Priority
8. CCTV
9. Passive surveillance
10. Active surveillance by An Garda Siochana

ES1.5.2 Coolmine Level Crossing

Figure ES-11 Coolmine Option 3 - Emerging Preferred Option Coolmine Level Crossing Replacement

The Emerging Preferred Option provides a new road bridge over the railway line and canal connecting to the north of St. Mochta's Grove / Station Court and to the south of the Riverwood Court Road. A new standalone pedestrian and cycle bridge will be provided over the railway line immediately adjacent to Coolmine Station.

At Coolmine the maintenance of road access north-south across the railway is important due to the high level of traffic using the existing road. The proposed replacement roadway will provide a critical link for traffic flows between Castleknock/Carpenterstown to the south with Blanchardstown/Coolmine to the north. (See Annex ES 1.1: Figure 08)

SPECIFIC COMMENTS - COOLMINE LEVEL CROSSING

Our focus will be on Option 1, 3, 6 and 7 as these options have gone through to Phase 2. *(Although there is an issue in the report stating that Options 1,3,4 and 6 will go through to Phase 2, We expand further on this issue below)*

- Will there be cycle paths provided on the overbridge on Option 3?
- Concerns about the entrance to cycle and pedestrian bridge through Coolmine car park. No connectivity and will put people who cycle and pedestrians at risk from conflict with car drivers and walkers commuting across the car park. The car park will need to be redesigned to cater for all modes of transport. This is one of the "5 needs" of design needs for cyclists referenced in the National Cycle Manual. https://www.cyclemanual.ie/manual/thebasics/fiveneeds/
- Will the new pedestrian and cycle bridge connect to the Royal canal entrance? Space is limited and might put people in danger trying to join the royal canal from the new pedestrian and cycle bridge on the Northside of the royal canal as the entrance to the Royal canal is situated between Sheepmore lane and the level crossing. Pedestrians and cyclists will have to walk back towards the level crossing to enter the royal canal towpath. How will this area be laid out when the level crossing is closed? Will it become a place for people to park their cars? Placemaking and well thought out design is required to make this location inviting also at night time to make entering the royal canal towpath safe and well lit up for walkers and people who cycle in the evening or commuting from employment for example.
- In the preliminary option design selection Options 1, 3, 6 and 7 are given green to go ahead to Phase 2 although in the report you state that Options 1, 3, 4 and 6 are going to Phase 2? This doesn't make sense. Is there a mistake? Can you clarify this please? This means that Option 7 is being dropped which was given green according to the MCA criteria and Option 4 which was red is going instead to Phase 2? This is really important for people who cycle and walk as Option 7 is not being considered and it's a walking and cycling bridge. We have attached the preliminary options report below.

9.3.3.2 *Preliminary Options Assessment*

Table 9-6 below provides a summary matrix of the comparative assessment undertaken as part of Stage 1 MCA. Options deemed to be feasible and comparably more advantageous than other options are identified to progress to Stage 2 MCA for a more detailed assessment. A complete detailed Stage 1 MCA matrix is provided in **Appendix 6.3B**.

Table 9-6 Stage 1 MCA Matrix

Criteria	Do Nothing	Do Min	Options							
			1	2	3	4	5	6	7	8
Economy										
Integration										
Environment										
Social inclusion										
Safety										
Physical Activity										
Shortlisted for Stage 2 MCA	No	No	Yes	No	Yes	No	No	Yes	Yes	No

9.3.3.3 *Summary and Recommendations*

As shown above Option 1, Option 3, Option 4 and Option 6 will progress for a more detailed MCA Stage 2 assessment.

- Option 1 – Online Overbridge;
- Option 3 – New Overbridge Connecting St.Mochta's Grove to Luttrellpark Road;
- Option 4 – Under Rail and Over Canal; and
- Option 6 – Overbridge to east of Coolmine Road.

9.3.3.2 Preliminary Options Assessment

Table 9-6 below provides a summary matrix of the comparative assessment undertaken as part of Stage 1 MCA. Options deemed to be feasible and comparably more advantageous than other options are identified to progress to Stage 2 MCA for a more detailed assessment. A complete detailed Stage 1 MCA matrix is provided in **Appendix 6.3B**.

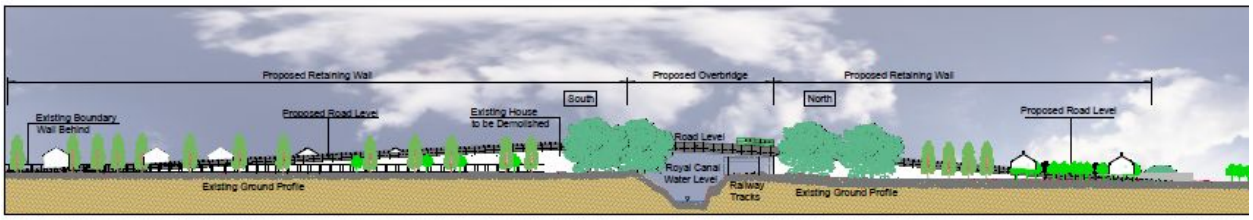
Table 9-6 Stage 1 MCA Matrix

Criteria	Do Nothing	Do Min	Options							
			1	2	3	4	5	6	7	8
Economy										
Integration										
Environment										
Social inclusion										
Safety										
Physical Activity										
Shortlisted for Stage 2 MCA	No	No	Yes	No	Yes	No	No	Yes	Yes	No

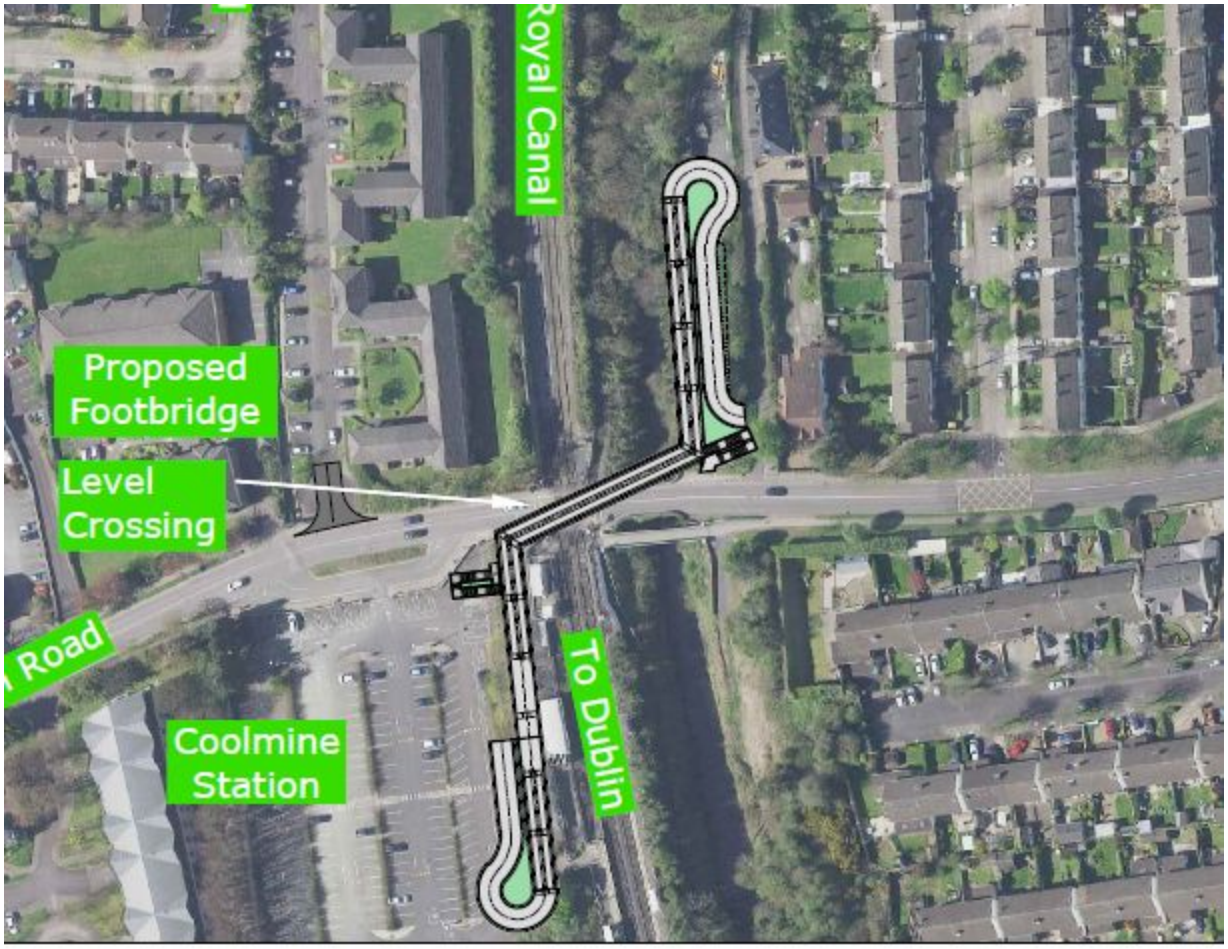
9.3.3.3 Summary and Recommendations

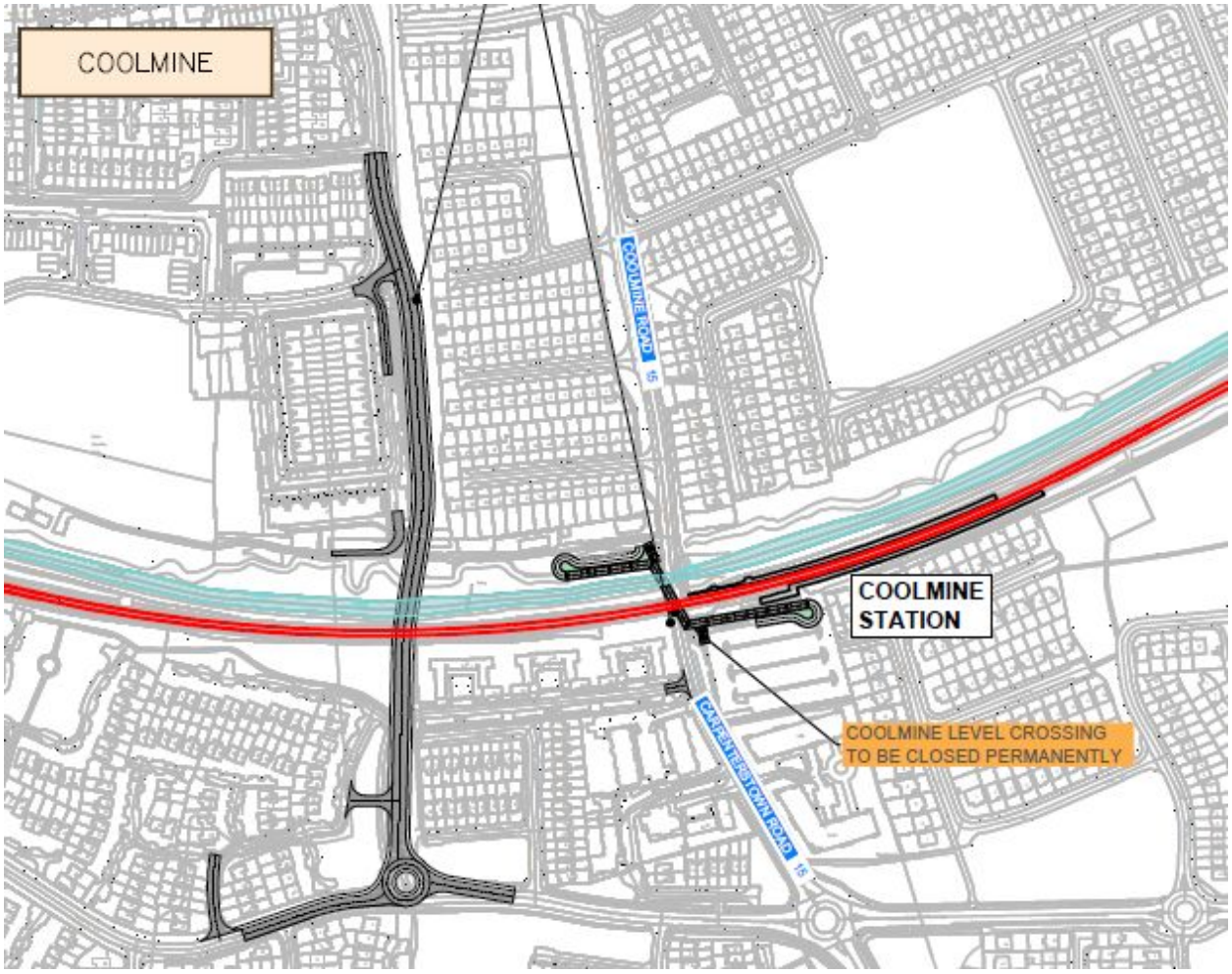
As shown above Option 1, Option 3, Option 4 and Option 6 will progress for a more detailed MCA Stage 2 assessment.

- Option 1 – Online Overbridge;
- Option 3 – New Overbridge Connecting St.Mochta's Grove to Luttrellpark Road;
- Option 4 – Under Rail and Over Canal; and
- Option 6 – Overbridge to east of Coolmine Road.


Proposed Retaining Wall
Proposed Overbridge
Proposed Retaining Wall
South
North
Existing Boundary Wall Behind
Proposed Road Level
Existing House to be Demolished
Road Level
Proposed Road Level
Royal Canal Water Level
Railway Tracks
Existing Ground Profile
Existing Ground Profile


Riverwood Distributor Road
To Maynooth
P4
P1
P5
P2
P3
P4 Riverwood Road
P5 Riverwood Court
P1 Sheepmoor Lane
P2 Station Court Way
P3 St. Mochta's Green
ELEVATION
ELEVATION
Station Court Way
Lucan Park
Royal Canal
Proposed Road Alignment
Proposed Footbridge
Level Crossing
Coolmine Road
Riverwood Distributor Road
Carpenterstown Road
Coolmine Station
To Dublin
N


Royal Canal
Proposed Footbridge
Level Crossing
Road
Coolmine Station
To Dublin


COOLMINE
COOLMINE ROAD
15
COOLMINE
STATION
COOLMINE LEVEL CROSSING
TO BE CLOSED PERMANENTLY
CASTLETHORNTON ROAD
15

SPECIFIC COMMENTS - PORTERSTOWN LEVEL CROSSING

- The emerging preferred option in the Executive summary report mentions Option 2 as the preferred option for Porterstown level crossing. It is not clear why this option is selected in either report? Can you clarify this, please? From the preliminary assessment report, the MCA shows that Option 1 is green for all criteria but Option 2 is the preferred option in the Executive summary report. Can you explain your decision for this, please? Although you do mention that all Options from 1 to 4 will go to Phase 2.
- Option 3 looks like the best option purely from sightlines and the ability to maintain speed and momentum which makes this option more attractive than the nested design in the other options provided. It also has the ability to reduce the gradient to <1:5 to possibly <1:3.5 which will make it easier again to cross for people who cycle or parents with cargo bikes and less well able-bodied people. Although it might have an impact on the sight and heritage of Kennan bridge when built.
- Why was a tunnel/underpass not considered for this level crossing?
- Option 1 would be a significant detour to the hundreds of students and parents crossing this location currently at Kennan bridge for both via the Royal Canal from the west and north from Clonsilla Village..
- There is an SHD development under consultation with An Bord Pleanala for the Old porterstown school. How will this affect your plans?
- Have you considered the volume increase in pedestrians with the new Kellystown development which is out to consultation at the moment with Fingal Co Council? An underpass connecting the Royal Canal and Kellystown and Scoil Choilm Primary school and LCC post-primary would be important here.
- What are the approach elevations for cycling?
- What is the width of the cycle lanes on these bridges in all options?
- What is the width of the pedestrian path (5m shared walking/cycling path, assuming 1.5m per the direction of cycle lane and 2m pedestrian)
- Is it a shared pedestrian and cycle bridge?
- How will the entrance to the bridge for cycling and pedestrian work with the access and egress point for the entrance to St Mochtas Football club? Both locations are very close to each other and there is a possibility of pedestrians and cyclists coming down of the bridge in front of vehicles exiting the football club.
- In the image above the old Porterstown school is at pre-application with An Bord Pleanala and could possibly be given planning permission for apartments. How will this work with the bridge designed into this location? **Case reference 307464** Old schoolhouse site
- In summary, it would be nice to get more detailed maps and designs for all Options on Phase 2. If an underpass option could be considered it would be welcome by Fingal Cycling Campaign

Option 3 – Pedestrian and Cycle Bridge – Straight Approach Ramp

This option follows the same bridge alignment as Option 2 but features straight ramps on either side of the railway as opposed to nested ramps. The ramps on either side of the bridge will not exceed 5% gradient.

Figure 9-46 Option 3 Pedestrian and Cycle Bridge – Straight Approach Ramps (Copyright Ordnance Survey Ireland – 0039720)

9.3.4.2 Preliminary Options Assessment

Table 9-8 below provide a summary matrix of the comparative assessment undertaken as part of Stage 1 MCA. Options deemed to be feasible and comparably more advantageous than other options are identified to progress to Stage 2 MCA for a more detailed assessment. A complete detailed Stage 1 MCA matrix is provided in **Appendix 6.3B**.

Table 9-8 Stage 1 MCA Matrix

Assessment Criteria	Do Nothing	Do Min	Options			
			1	2	3	4
Economy						
Integration						
Environment						
Social inclusion						

Assessment Criteria	Do Nothing	Do Min	Options			
			1	2	3	4
Safety						
Physical Activity						
Shortlisted for Stage 2 MCA	No	No	Yes	Yes	Yes	Yes

SPECIFIC COMMENTS - CLONSILLA LEVEL CROSSING

Figure 9-48 Clonsilla Level Crossing Options (Copyright Ordnance Survey Ireland – 0039720)

Assessment Criteria	Do Nothing	Do Min	Options						
			1	2	3	4	5	6	7
Physical Activity									
Shortlisted for Stage 2 MCA	No	No	Yes	Yes	No	Yes	No	No	No

9.3.5.3 Summary and Recommendations

As shown above Option 1, Option 2, and Option 4 will progress for a more detailed MCA Stage 2 assessment.

- Option 1 – Pedestrian and Cycle Bridge;
- Option 2 – Overbridge 200m to the east of the existing crossing; and
- Option 4 – Overbridge 210m to the west of existing crossing.

ES1.5.4 Clonsilla Level Crossing

Figure ES-16 Clonsilla Option 1 - Emerging Preferred Option Clonsilla Level Crossing Replacement

The Emerging Preferred Option provides a new pedestrian and cycle bridge over the railway to the west of the existing level crossing. Given the low traffic flows utilising the crossing combined with the proposed new road bridge at Barberstown to the west and the Diswellstown Link Road to the east of the crossing,a new pedestrian and cyclist bridge is considered the optimal solution.

The proposed pedestrian cycle bridge is presented below in sectional elevation looking west to illustrate nature of the proposed works.

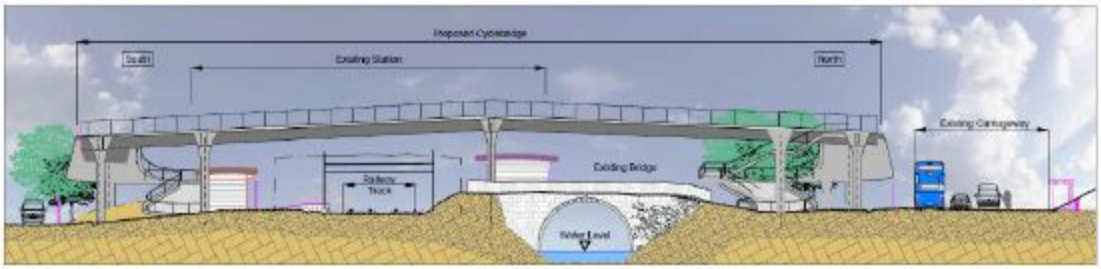


Figure ES-17 Clonsilla Emerging Preferred Option: Cycle Bridge - Sectional Elevation

SPECIFIC COMMENTS - CLONSILLA LEVEL CROSSING

- We agree with your assessment of Option 1 as the emerging preferred option as it would be unnecessary to build another road over bridge with new bridges going over the canal east and west of this location. THis would also cause further noise and air pollution along the Royal canal and diminish its tourist potential and enjoyment as a green space
- Was an underpass/Tunnel considered?
- What are the approach elevations for cycling?
- What is the width of the cycle lanes on these bridges in all options? It looks like 5 meters will be a shared space. Ideally, it should be segregated bridges to avoid collisions.
- What is the width of the pedestrian path (5m shared walking/cycling path, assuming 1.5m per the direction of cycle lane and 2m pedestrian)
- Does the new bridge account for the Kellystown development, which would see a roundabout placed further down the present road to Beechpark and the entrance to Luttrellstown Castle?

Option 1 – Pedestrian and Cycle Bridge

This option includes the provision of a new Pedestrian and cycle footbridge at 5m in width. The bridge provides a connection between Clonsilla road either side of the crossing. The arrangement of the bridge utilises nested ramps to the north and south of the existing station where it crosses.

The rail level at the crossing is approximately 63.2m above MSL and the canal at 61.5m above MSL with the bridge level over the railway at 69.7m above MSL. The ramps on either side of the bridge will not exceed 5% gradient. Constraints on bridge crossing here include the train station, the Royal Canal, the protected railway structures, and the canal bridge. Vehicular traffic will need to divert around the crossing, the diversion being an estimated 4.3km.

SPECIFIC COMMENTS - BARBERSTOWN LEVEL CROSSING

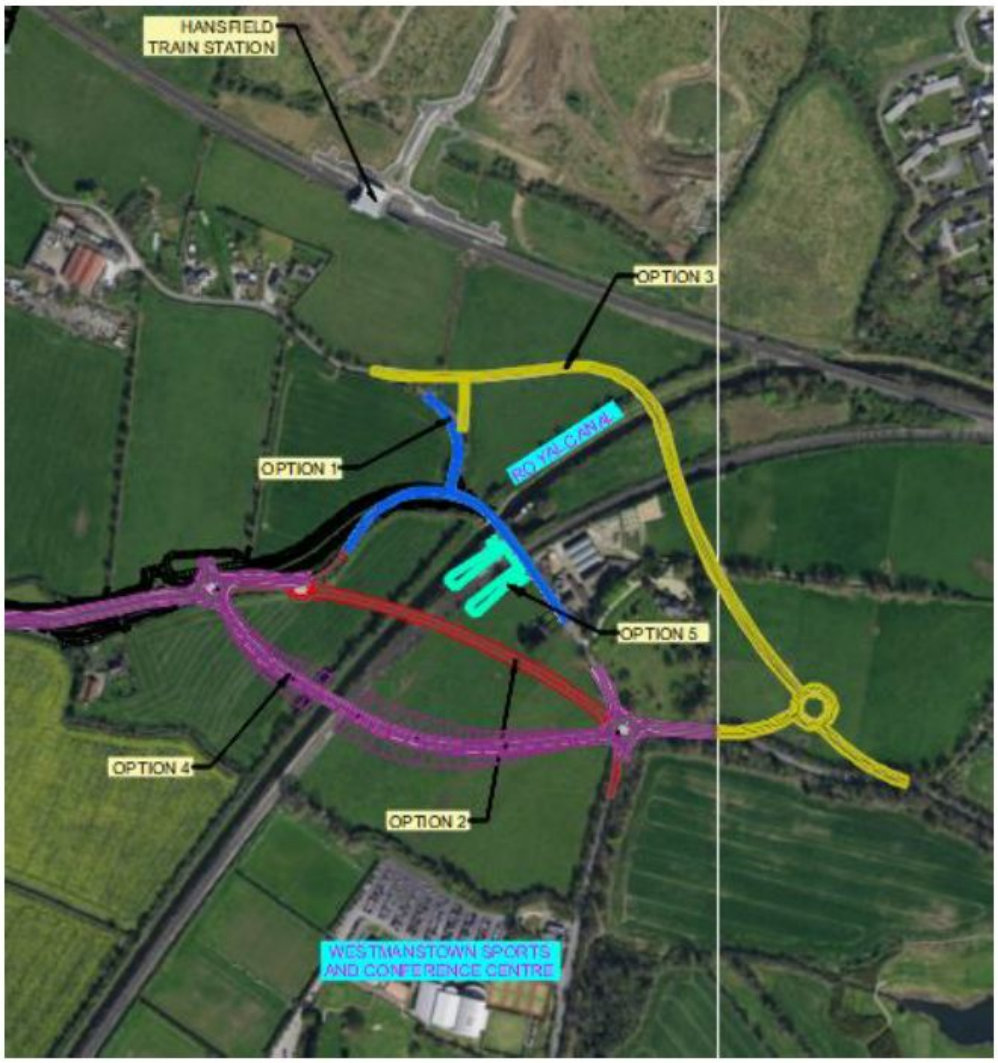


Figure 9-55 Barberstown Level Crossing Options (Copyright Ordnance Survey Ireland – 0039720)

EMERGING PREFERRED OPTION BARBERSTOWN

ES1.6.1 Barberstown Level Crossing

Figure ES-18 Barberstown Option 4 - Emerging Preferred Option Barbertown Level Crossing Replacement

The Emerging Preferred Option provides a new road bridge over the railway line and canal, southwest of the current level crossing and connecting the existing R121 to the east of the rail to the Barberstown Lane to the west of the rail line. (See Annex ES 1.1: Figure 10)

SPECIFIC COMMENTS - BARBERSTOWN LEVEL CROSSING

- It's concerning that there is no separate cycling and walking bridge for a location that has no developments and is not hindered by space constraints, although the current proposal for Kellystown Road would include a two-way cycle lane both could have two-cycle/pedestrian connections for local access.
- Are there separate cycle lanes and pedestrian paths in the Options 2 and 4 going to Phase 2?
- There is an opportunity to extend a bridge from Option 3 to connect to Hansfield train station to increase connectivity in this area and also Westmanstown golf club and the Liffey Valley region.

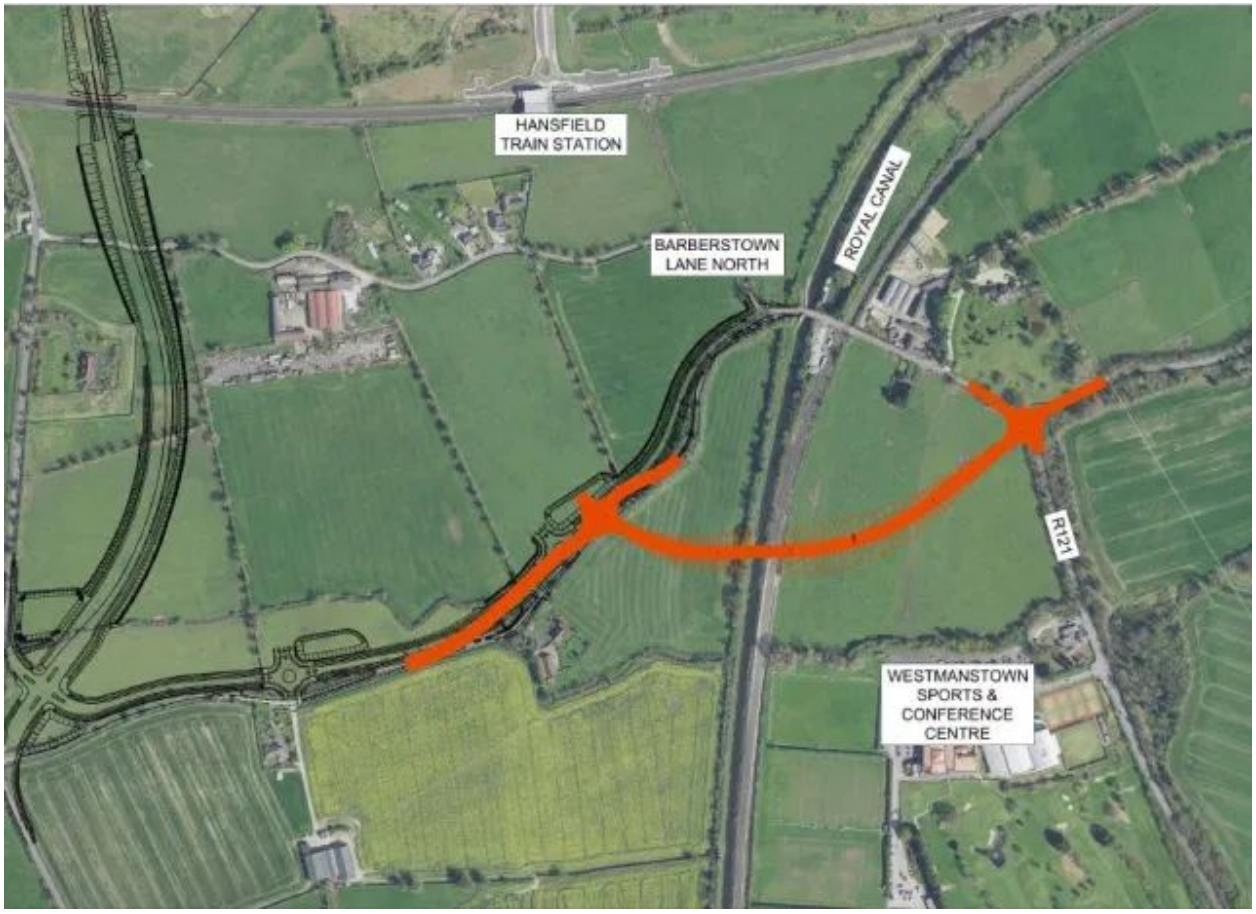

HANSFIELD
TRAIN STATION
BARBERSTOWN
LANE NORTH
ROYAL CANAL
R121
WESTMANSTOWN
SPORTS &
CONFERENCE
CENTRE

Table 9-12 Stage 1 MCA Matrix

Assessment Criteria	Do Nothing	Do Min	Options					
			1	2	3	4	5	6
Economy								
Integration								
Environment								
Social inclusion								
Safety								
Physical Activity								
Shortlisted for Stage 2 MCA	No	No	No	Yes	No	Yes	No	No

9.3.6.3 Summary and Recommendations

As shown above and outlined below Option 2 and Option 4 will progress for a more detailed MCA Stage 2 assessment.

- Option 2 – Overbridge 130 metres to the West of the Existing Level Crossing
- Option 4 – Overbridge 250 metres to the West of the Existing Level Crossing

SPECIFIC COMMENTS - BLAKESTOWN LEVEL CROSSING

- We would recommend proceeding with a cycling and walking bridge going to Phase 2 as it is mentioned in the preferred options to close this crossing completely. This would be unfortunate from a cycling and walking perspective and reduces connectivity for people who want to cycle and walk in quiet locations and provides better options. We would recommend an underpass is a viable option for the Blakestown crossing.

CONCLUSION

Fingal Cycling Campaign welcomes the DART+ West plans. We are excited to see the plans put forward by Irish Rail. We have some concerns around the design standards that will be used. The current Irish design standards are not of a high quality and lack detail. So we would stress highly that it is pointless using these standards as a reference or guide as they are below par and unacceptable in our view. We would recommend Irish rail take on board our points referenced and also highly stress to look further afield outside Ireland to other countries who have expertise in this area for many decades such as the Dutch design standards for best practice that will help cycling for all ages and abilities and future proof this design for generations. We have attached a snippet of guidance from the Design manual for urban cycling

traffic [CROW] in our submission which reiterates many of our points. We understand it is at an early design stage but are very concerned about cycling and pedestrian surveys taken only on one day for this initial phase of this design and will be a factor in not building high quality infrastructure (See Appendix III).

Please contact us if you have any questions

Regards

Ken O'Connor (Acting Secretary)
Paul Corcoran

Fingal Cycling Campaign

Fingal@Dublincycling.com

APPENDIX I - IRISH DESIGN STANDARDS

Please see guidelines referenced in the National Cycle Manual for design standards for cycling and walking bridges and underpasses.
https://www.nationaltransport.ie/wp-content/uploads/2013/10/national_cycle_manual_1107281.pdf

1.9.4 Bridges
The key determinant of whether to mix cyclists and pedestrians on bridges is the speed of the bike. This is influenced by the length and slope of the bridge.

Non-traffic short flat bridges are suitable for shared use with pedestrian priority.

However, longer bridges where cyclists are likely to build up higher speeds, should segregate both modes.

Where new bridges are intended for cyclist usage, it is recommended that they meet the following requirements. Feature Design Requirement External parapet 1.2 to 1.4m height Clearance to parapet See Section 1.5.1 Surface Suitable for bicycle wheels and braking Lighting Sufficient for social security Landing points (each end) Bridge deck gradient < 1:20, to keep cycle speeds low Priority Design to reinforce pedestrian priority in mixed area at bridge access/egress aprons

5.3.3.6 Lighting and Safety at Isolated Locations

Outside of built-up areas, recreational routes will not normally require lighting unless there are specific road safety concerns, e.g. at junctions or crossings.

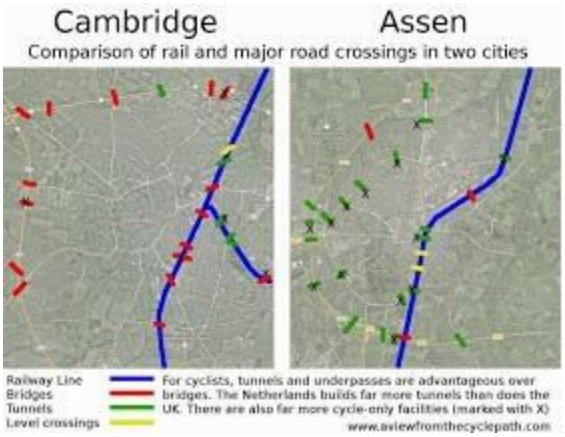
Underpasses require special attention to address a perceived sense of reduced personal safety for pedestrians and cyclists. Underpasses should be provided with a minimum level of 30 Lux unless a CCTV system requires a higher level.

APPENDIX II - DUTCH DESIGN STANDARDS

Why tunnels are better than bridges for cycling

Some useful information on why underpasses are preferred in the Netherlands (http://www.aviewfromthecyclepath.com/2014/08/why-tunnels-are-better-than-bridges-for.html?m=1)

> *"A couple of weeks ago a campaigner from Cambridge in the UK asked me a question about bridge parapet heights in the Netherlands especially with regard to clearing railway lines. He'd realised that he'd not had any problems due to climbing bridges in this country and assumed that the Dutch had standards which were more suitable for cyclists than the UK.*
>
> *"However, the answer to this question turned out to be more involved than just heights of bridges. Actually, in the Netherlands there are not many high bridges. Cyclists in the Netherlands use tunnels and underpasses far more often than bridges. There are very good reasons for this which I'll explain below, but first a graphic showing the facilities which exist in both Cambridge and Assen to cross railway tracks and major roads which would otherwise form barriers to cycling:*



Crossings marked with an X are cycle and pedestrian exclusive crossings. Note that all but three of the combined crossings for cyclists and motor vehicles in Assen have separate cycling infrastructure. Crossings of the river Cam and canals in Assen are not included though they make much the same point. There are many canal bridges in Assen - mainly cycling specific flat opening bridges which do not require riding uphill and none have obstacles upon them. Assen's many crossings form important links in the fine grid of high quality cycling facilities required for a high cycling modal share.

The diagram above does not include

bridges over rivers and canals. No

bridges in Assen require dismounting

like this example in Cambridge.

As you can see, in both cities, the railway line cuts the eastern part of the city from the western part while major roads have a similar effect on the western parts of the cities. The maps show crossings of motorways and ring-roads only, excluding rivers and canals as well as roads closer to the centre.

Comparison of crossings in Assen and Cambridge

It's immediately obvious that there are far more green crossings (tunnels) in Assen than there are red (bridges). The reverse is true in Cambridge. What's more,

The railway has a similar effect on both cities, cutting off people in the east from the centre. More people live east of the railway in Cambridge than is the case in Assen. Note that in Assen all the most commonly used crossings are either tunnels or level crossings while in Cambridge the majority of crossings are bridges.

It's a similar story with major roads. Both cities have a motorway running north-south west of the city. Cambridge also has a dual carriageway (a road built to motorway standard) running west-east across the north of the city, while Assen has a partial

ring-road which runs around the west of the city. These roads are crossed almost entirely by tunnel or level in Assen while they are crossed by bridges in Cambridge.

All crossings in Assen can be used

without slowing down. This is one

of the many cycle and pedestrian

crossings of a major road in Assen.

Four metre wide cycle-path, separate

pedestrian path, gentle inclines, well

lit and we can see right through for

good social safety. Built in the 1970s

well maintained: last resurfaced 2012

Note also that in Assen the crossings mostly have an X which indicates that they are cycle-specific crossings. There are also crossings shared with cars, but these include separate infrastructure for cycling.

In Assen it is rare for a cyclist to use a bridge, common to use tunnels, and very often we cross on infrastructure which is cyclist specific so that cars are rarely seen. In Cambridge the crossings are mostly bridges, usually along the same routes as used by cars, and in several cases you have to cycle on the road to cross major roads or the railway line.

Dutch standards for Tunnels and Bridges

Het is stevig doortrappen voor fietsers. Jennifer Hamersma

Fietstunnel Assen zorgt voor ophef

De fietstunnel die het centrum van Assen verbindt met Assen-Oost was de afgelopen weken gesprek van de dag.

ASSEN

Deze tunnel maakt deel uit van het Stationsgebied. Dit gebied, onderdeel van het infrastructurele plan FietsnAs, ondergaat de komende jaren een metamorfose. De tunnel is voor veel mensen te steil. De gemeente is niet van plan om de fiets tunnel te gaan verbouwen en de helling houdt u en blijft vijf procent.

Aandacht

Bewonersoverleg Assen-Oost en de Fietsersbond hebben de publiciteit gezocht om aandacht te vragen voor het probleem van de steile helling waar veel weggebruikers dagelijks last van ondervinden.Het CDA heeft de desbetreffende wethouder tijdens een raadsvergadering gecon-fronteerd met de situatie. De fractie heeft een concreet alternatief, namelijk de bicycle lift. De lift helpt fietsers de steile helling op te komen. Donderdag 14 maart is het opnieuwde doel betreffende het stationsgebied. Het Bewonersoverleg Assen-Oost en de Fietsersbond www.hamnow.eu dan spreekuur.

CROW still recommend maximum of 5% incline and that's what this tunnel has. Complaints from some local cyclists have led to this Assen underpass being redesigned at 3.5%.

The CROW Design Manual for Bicycle Traffic includes many details of how both bridges and tunnels should be designed to make cycling over and through them safe and convenient. I'm not going to repeat all of their recommendations here but will include some important points.

1. *The incline to a bridge or tunnel should be less than 1 in 20 (5%)*
2. *Upward inclines: "Upward inclines require cyclists to make an extra effort and should be avoided where possible in the design of a bicycle friendly infrastructure."*
3. *Downward inclines: "On long declines, attention should focus on the speed of the descending cyclist". It is suggested that planners should expect "35 to 40 km/h" and that there should be "plenty of free deceleration space at the bottom of inclines, with no intersections, sharp bends or other obstacles in the way".*
4. *Absolute minimum width of cycle-paths should be 3 m. That's permissible only if there's a separate 1 m minimum walking path on both sides of the cycle-path. Without a separate walking path (i.e. where no pedestrians are expected, this isn't shared use) the minimum width becomes 4.15 m, made up of 3.5 m cycle-path plus 0.325 m clearance between each side of the cycle-path and any railings or wall.*

All the examples in Assen meet all these requirements except for one tunnel built in the 1960s which is a little too narrow.

Generally speaking, it is better that cyclists do not have to climb to cross roads or railway tracks. It is better to have cyclists continue on flat infrastructure and that powered vehicles should climb.

Only three bridges in Assen have a significant inclines for cyclists. Most are completely flat like this example.

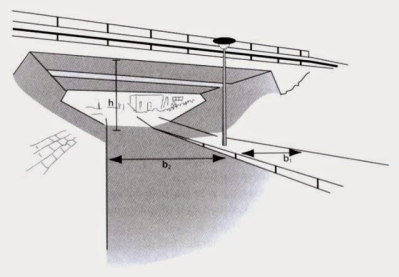
Advice for bridges

1. *Gradients should not be constant all the way up the incline. Cycling speed diminishes when climbing. For relatively short inclines (height less than 10 m), the highest section should be less steep than the lowest section to enable cyclists to maintain an almost steady speed uphill.*
2. *If a height over 5 m must be climbed, 'resting places' in the form of a horizontal section about 25 m in length should be provided before cyclists must to climb again.*
3. *Wind nuisance is greatly increased on an exposed bridge so this should be taken into account. Climbs against the prevailing wind should compensate by being less steep. Wind barriers can be installed on bridges to reduce the nuisance to cyclists.*
4. *It should be possible to cycle onto and over a bridge. Cyclists should never be required to dismount. Escalators or lifts to access the bridge are OK as a last resort measure.*

Problems with bridges

The following are given as specific problems with bridges:

1. *There are often longer inclines than with a tunnel (because of greater height difference in order to clear railway lines, for instance - precisely the parapet height question which prompted this blog post)*
2. *There is a possibility of fear of heights with a high bridge*
3. *Bridges must be designed to keep height difference to be overcome by cyclists as small as possible*
4. *Suggestion that with a cycle-bridge across the road: if necessary the road should be lowered to make the cycle-bridge less high.*



CROW ideal tunnel impression. Short

open, well lit, separate pedestrian path

also of good width. Splayed out sides

Advice for tunnels

1. *Steeper gradients can be used than with a bridge because cyclists going into a tunnel first ride downhill and pick up speed which can be used to climb back out of the tunnel.*
2. *Tunnels can be made less deep by moving roads and railways above them upwards.*
3. *Social safety issues should be addressed by making it possible to see out of a tunnel before you enter, and by avoiding long tunnels.*

4. *A "semi-buried" design can work well, with the road above rising by about two metres, effectively a small bridge. This makes the tunnel into an open structure and reduces the change in height required of cyclists.*
5. *Tunnels require good drainage (often pumped) and should be designed to be easy to clean.*
6. *Tunnel height should never be less than 2.5 m and width should be no less than 1.5 x the height in order that the tunnel feels comfortable to use.*
7. *Lights and light colours are preferable in a tunnel to make it appear as 'open' as possible. The time spent in a tunnel should be minimised and sides should be splayed outwards.*

Some of the suggestions refer to social safety issues. In short, infrastructure should not lead to a feeling of unease, especially after dark.

All the tunnels were retrofitted to Assen. The process continues. This tunnel dates from 2008. Note that this is an example of where the road rises slightly as the cycle-path drops.

Why tunnels are preferred

CROW consider that tunnels are "often more favourable". They make many points including:

1. *Tunnels have a smaller height difference than bridges. Only need clearance for the height of a cyclist, not for trucks or trains plus electric lines.*
2. *Tunnels take up less space than a bridge because inclines are shorter*
3. *Tunnels are easier to fit into an existing landscape.*

4. *Tunnels offer protection from wind and rain*
5. *Tunnels offer faster journeys than bridges due to less climbing*
6. *In rural areas tunnels can also be useful for wildlife*

There are also other advantages which may seem to be quite small such as that tunnels naturally provide shelter when it rains.

Tunnel disadvantages

A possible disadvantage is low social safety. It is important that cyclists can see out of a tunnel before they enter it. There should be no turns within the tunnel, no-where for a potential mugger to hide. Obviously tunnels should also be well lit.

Drainage is very important in tunnels. The Netherlands has many tunnels which are below the water table and require pumps. Nevertheless, it is rare that tunnels become flooded.

The best tunnel in Assen is a bridge

Conceptually, this is an incline-less tunnel for cyclists, not a bridge for cars. It provides part of a direct and uninterrupted route by bike from a new suburb to the centre of Assen. This bridge has no benefit at all for drivers, only for cyclists. Re-opening the canal

for tourism was a side-benefit. This

replaced a large flat road junction.

If possible, it's best that cyclists don't have to change level at all. If motor vehicles can be sent into a tunnel or over a bridge then they no longer hinder cyclists.

In 2007, there was a traffic light junction at this location in Assen. For cyclists to use the road to travel directly into the city they had to stop at a traffic light. By 2008 this bridge had been built. It severs the pre-existing link by motor vehicle into the city, leaving the direct route as a bicycle road which excludes through motor traffic.

This bridge has no utility for drivers. It actually reduces their options as it is now impossible for a car travelling over the bridge to turn left of right as used to be possible.

Instead of building this bridge to carry four lanes of motor vehicles, a much smaller and less expensive bridge could have been built to take cyclists over the road, a small tunnel could have been excavated to take them under the road or a signal controlled crossing could have been installed on the level. However all these other options would have meant a reduction in speed and convenience for cyclists due to inclines for bridge or tunnel and delays at traffic lights for a level crossing. There could also have been social safety issues. The solution, to ensure the best possible service for cyclists was this bridge. Cyclists now have a smooth, level uninterrupted route which is well lit at night and has good sight lines in all directions.

Just as recommended by CROW, motor vehicles have to use inclines in this example rather than cyclists.

Short note about funneling

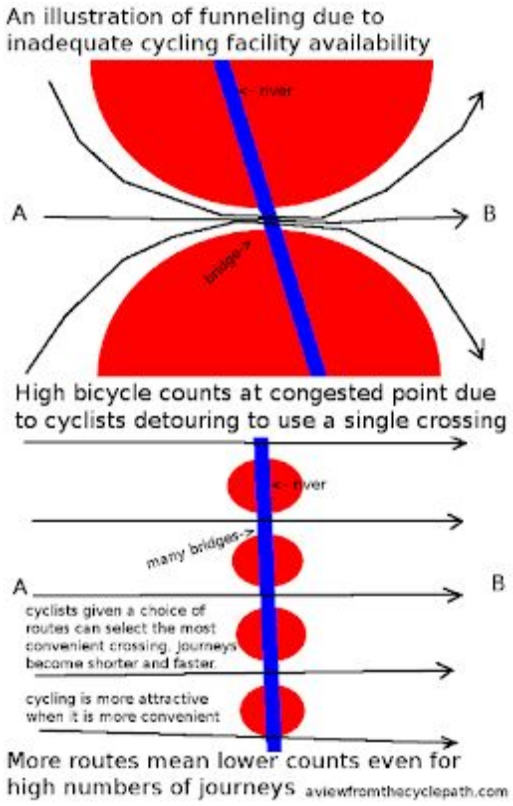


Illustration of how high cycle counts can indicate

a problem: A lack of bridges or tunnels to cross

railways, roads, rivers or canals can force people

onto the same crowded route. High cycle counts

are not a symbol of success when they result from

detours and traffic-jams for cyclists. A proper

comprehensive grid of infrastructure keeps counts

down. Not so good for photographers who want

to see lots of bikes but good for individual cyclists.

Unless enough pleasant routes are provided, excess numbers of cyclists are likely to be seen on the few remaining routes. It can be especially a problem where there are too few crossings of railway lines, major roads or rivers. Such funneling can make for great promotional headlines ("N bicycles per day pass this point") but actually it's not good news for cyclists at all because this actually means a detour onto overcrowded cycle-paths and conflict.

It is far better for cyclists that there should be more available routes so that more people can make direct journeys and there is less of a need to detour to find a comfortable route. Detours should be minimised by providing extra cycle crossings of large roads, railway lines, rivers and canals. This makes cycling more viable for more people and therefore more attractive. This principle should not only be applied for what are considered to be practical routes - CROW state that "recreational routes can also form reason enough to remove barriers".

Reducing funneling in Groningen

Groningen has many students, making up a relatively transient population who while they are more likely to cycle are also likely not to know the local area well. The city used specific marketing to encourage people to choose a selection of other routes which would serve them better. However, it's important to note that this was only possible because a very comprehensive grid of cycling infrastructure already existed.

It comes down to having a proper grid

I've often railed against hype about exceptional pieces of infrastructure. They're nice to see, but not really very important. The fact is that a few impressive bridges or tunnels are of relatively little use unless they form part of a comprehensive grid of good quality infrastructure. The grid is really the exceptional achievement of the Netherlands. The grid is the thing which should inspire and be copied elsewhere.

Tunnels are less photogenic than bridges, but they are preferable for the reasons explained above. However, whether tunnels or bridges are built it is most important that there are enough of them, that they are of high enough quality and that they link everything else together.

UNDERPASS DUTCH DESIGN

Here is a good reference for cycling underpass by a Dutch cycling infrastructure blogger.

https://bicycledutch.wordpress.com/2016/11/15/a-roundabout-bypass-in-goes/

https://youtu.be/_FwhBFL-0F0

Here is another example of a Dutch design in Harlem which is similar to the Ashtown issue with a major route to cross and a built up area. https://youtu.be/EfD8_ApgXi4

APPENDIX III

Traffic counts and Pedestrian and cycle counts.

It's disappointing to read in the Main report in Section 3 under Transport surveys that pedestrian and cycle counts were only done on one day on the 5th February 2019 and there were 3 week surveys completed for vehicle traffic.

This is the data from the Phoenix park weather station and you can see that there was quite a lot of rain that day of 13.3.mm. How accurate would the counts be on a rainy day for pedestrians and cyclists?

date	ind	maxtp	ind	mintp	igmin	gmin	ind	rain	cbl	soil
05-Feb-19	0	13.3	0	-1.2	0	-6.3	0	3.3	1008.5	3.932