7/5/2024

Old Kilcullen Heritage Trail

Feasibility Study

Final Revised Report 5/7/24

Rialtas na hÉireann Government of Ireland | Tionscadal Éireann Project Ireland 2040

Ár dTodhchaí Tuaithe Our Rural Future

Comhairle Contae Chill Dara Kildare County Council

'This project is being 'Funded by the Department of Rural and Community Development through the Outdoor Recreation Infrastructure Scheme'

Hayes Ryan Landscape Architecture

1.0 Introduction

Old Kilcullen Area Community Association (OKACA) came together as a group to increase and develop the potential of their community to flourish in the context of the rich cultural and natural heritage the area has to offer. The association identified a heritage trail as a way of providing a great amenity for residents in the area. The community wishes to highlight and simultaneously protect its heritage whilst enjoying it as a backdrop when exercising outdoors.

The area is set in an old medieval landscape that was once defined as an enclosed walled town. Although the remnants of the walls and gates of the town are unseen, the landscape as it presents itself is finely articulated between key features. The site of the round tower at Old Kilcullen is a listed National Monument in state care (Monument number 71). The monastic site, Old Kilcullen Church, Round Tower and Crosses[1] constitute a historically and archaeologically significant landscape locally and nationally.

Old Kilcullen is close to and within view of Dún Ailinne, upon Knockaulin Hill, the largest pre Norman earthen enclosure in the country. It also boasts the largest henge. Currently Dún Ailinne , is one of six candidate royal sites being considered for inclusion in the UNESCO World Heritage list. According to Johnston et al [2], "Dún Ailinne is one of the major ceremonial sites of the Irish Iron Age (600 BCE–CE 400), a time when society was becoming increasingly centralized. " The process of centralisation was "facilitated by performance though the site's construction and use. Physical movement in the context of ritual has been shown to affect the perception of social relationships. These would have been experienced through performance, including movement through the landscape, the visual dominance of the hill and the site located on it, the hierarchical arrangement of spaces within the bank and ditch, and the resulting ways in which movement and access are gradually more constrained through time. Experienced through the medium of ritual performance, these various aspects would have reinforced ideas of power and elite status, providing a context in which such constraints could have been created, justified, maintained and perhaps resisted."

This infers a certain relationship with the surrounding landscape and interestingly movement of people through the landscape.

2.Background to the Project

Kildare County Council applied for funding for the feasibility study of a heritage trail through the Department of Rural and Community Development Outdoor Recreation Infrastructure Scheme [3.] The fund was established to embrace Ireland's outdoors.
The strategic objectives of Embracing Ireland's Outdoors are:

[1] RMP number KD028-049005-, KD028-04906-, KD028-049002-, KD028-049003-, KD028-049004-, KD028-049010-, KD028-049011-, KD028-049012-

[2] Susan A. Johnston, Pam J. Crabtree & Douglas V. Campana (2014) Performance, place and power at Dún Ailinne, a ceremonial site of the Irish Iron Age, World Archaeology, 46:2, 206-223, DOI:10.1080/00438243.2014.883937

[3] https://www.gov.ie/en/policy-information/43eee-embracing-irelands-outdoors-national-outdoor-recreation-strategy-2023-2027

Leadership: To create a more coordinated, cohesive approach at national and county level to ensure best use of our resources.
Environment: To protect the environment through better planning and development of outdoor recreation, in keeping with best practice management of landscape and habitats.
Awareness: To create awareness of our outdoor opportunities and how to enjoy them responsibly.
Opportunities: To increase and support the number of people active in the outdoors, especially young people and under-represented groups.
Access: To protect and improve access to the outdoors, for the benefit of all.
Expertise: To improve the knowledge, skills and expertise of stakeholders and partners.

2.1 Landscape Character Areas

This background to the project aligns with the landscape character assessment completed by Kildare County Council. This includes valued views and prospects within the county.

Protected Views and Prospects ; The most relevant protected views and hill top views listed in the KCDP relevant to this study are; the hilltop view from Dún Ailinne and route 01, 02 and 23.

These routes are;

01 Views of Old Kilcullen to the east and Dún Aillinne to the west, from the R418 Motorway Interchange to the south of Moortown House. Knockbounce, Knockaulin, Old Kilcullen, Glebe North, Moortown and Moortowncastle.

02 Views to the east of Yellowbog Common, from the junction of R418/R448 to Halverstown crossroads, Yellowbog Common and Glebe South.

23 Views to the north-west of the Kildare Plains along the R418, south of Moortown House to Tippeenan Lower. (Moortown, Thomastown, Ballyshannon and Tippeenan Lower).[4]

Fig.1 Views , routes and prospects near Old Kilcullen

There will be no negative effect on any of these routes or prospects as a result of the proposed trail.

[4] Kildare County Development Plan 2023-2029

2.2 Purpose of the Project

Land based outdoor recreation is defined as activity that takes place in leisure time, requiring physical activity and access to outdoor space. It may require the construction of a purpose built facility (trail or track) , includes play in the natural environment and is not primarily focused on competitive activity. Pertinent to this project it includes walking, hill walking, hiking, running, cycling and riding. This study sets out to examine the feasibility of developing a trail in Old Kilcullen to provide outdoor recreation as described in a local context.

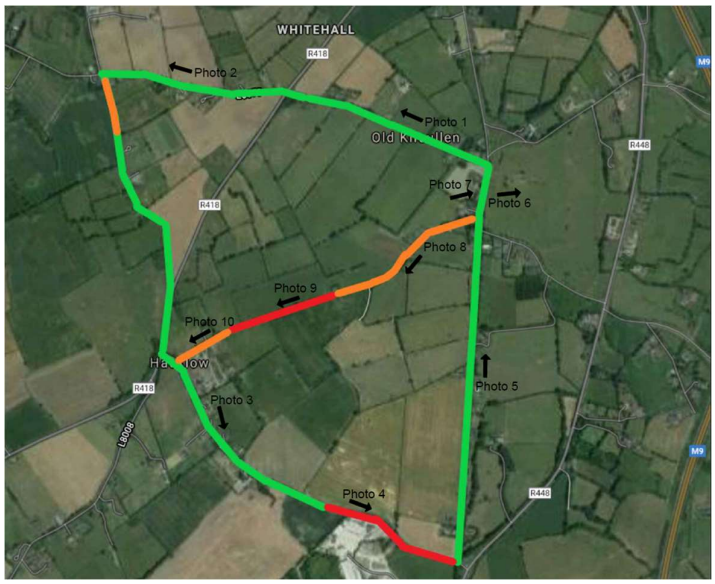


Fig.2 The alignment of routes studied for this trail feasibility study.

A recommended design will then progress the proposed walking and cycling route.
Similar to criteria established both at home and abroad, trails or networks of trails should be attractive and interesting places to be in and pass along. Landscaping, planting, artwork and interpretation boards have all been used to create interest in similar trails. Seating provided helps with inclusion by offering rest points. Trails increase the possibility of enhancing ecological features and biodiversity gain. In its current form the landscape around Old Kilcullen is not short of interest and has a rich biodiversity. The trail will essentially guide the user through an interesting archaeological and rural landscape including the listed national monument (monument number 71, in state care) at Old Kilcullen Church, its crosses and round tower.

(KD 028-0495005,KD 028-04906, KD 028-049002, KD 028-049003, KD 028-049004, KD 028-049010, KD 028-049011, KD 028-049012)[5]

2.2.1 An Outdoor Museum

The trail winds its way over a very interesting and stimulating landscape. The trail will allow for natural stops and halts at interesting features and some which may not be obvious without supplying information (QR points) site specifically along the way. The images below indicate some of the featues and potential of the outdoor museum.

[5] www.archaeology.ie

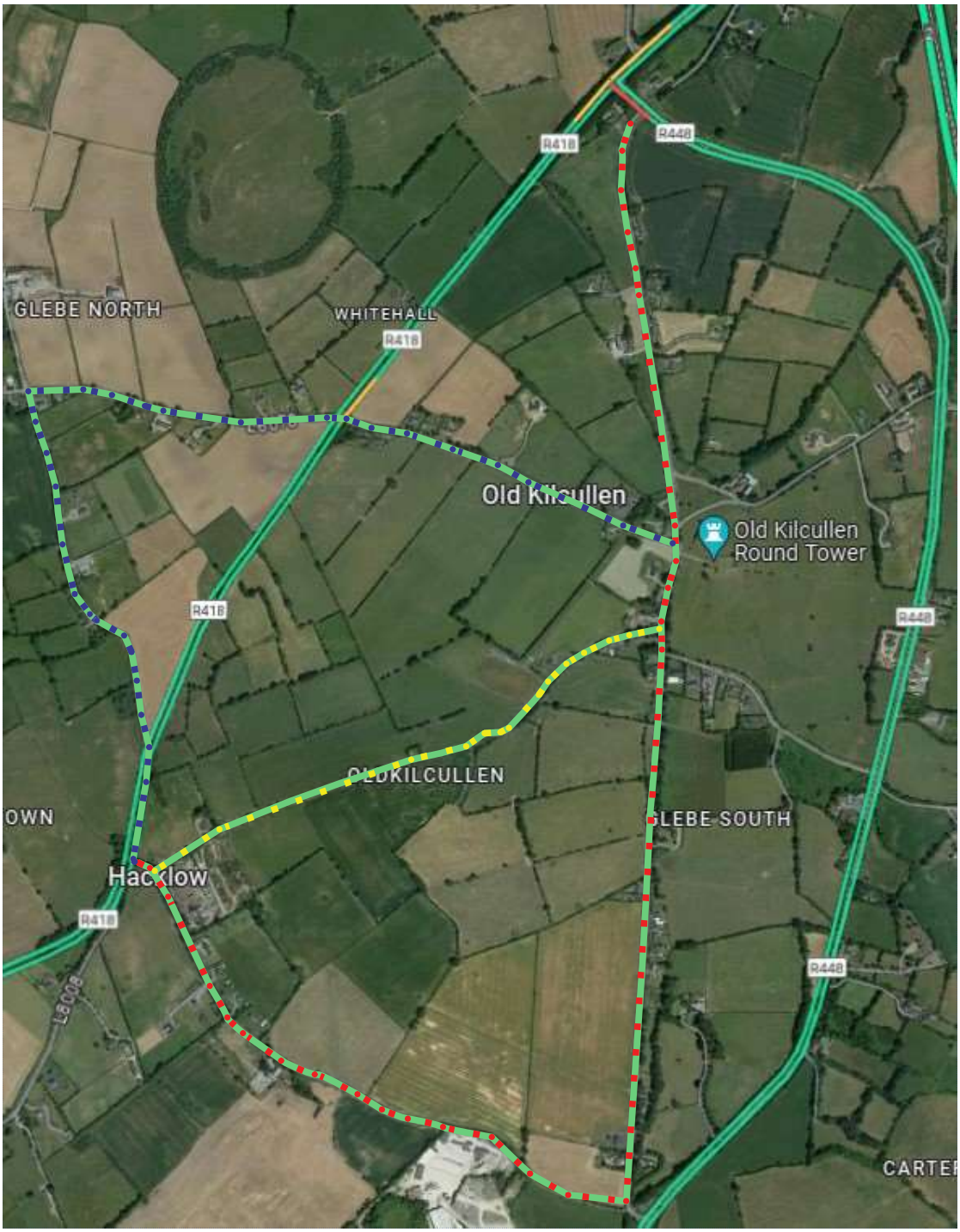


Fig.3

200m

Trail alignment unfeasible (crossing R418)
Trail alignment Phase 1
Moat Lane

[6] Adapted from Google Maps Pro

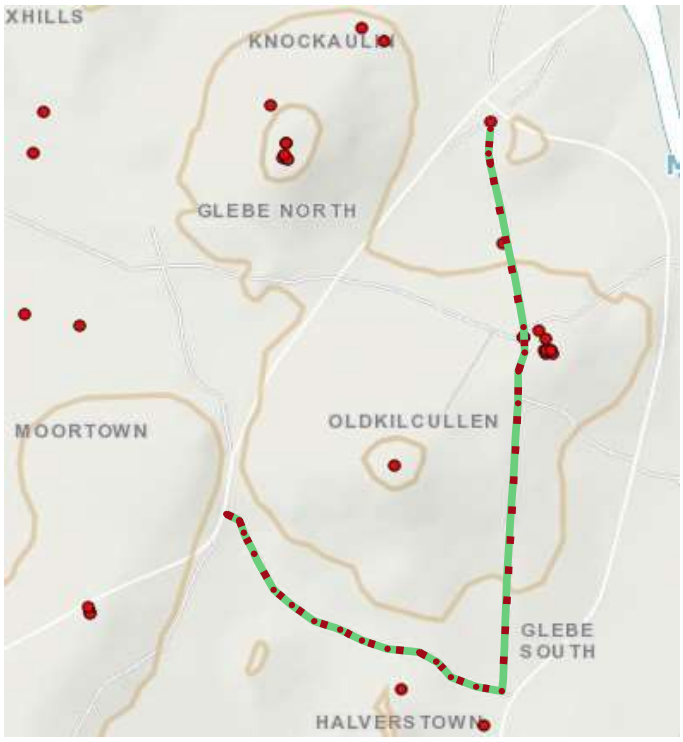


Fig. 4 Trail Phase 1 in relation to NMS SMR[7]. There is an obvious relationship between the landscape topography and the monument locations.

Fig. 5 Round Tower and High Crosses at Old Kilcullen

[7] https://heritagedata.maps.arcgis.com/


Fig.6 Fig.7 Lorg Lane, from Hacklow towards Halverstown Cross, along the existing carriageway. The lane most likely remains from the medieval landscape layout. It is at the foot of the hill marking a radius in the landscape as well as indicating a townland boundary.


Fig 8 Lorg Lane this segment requiring surfacing and hedgerow management. Some attractive remnants of the original stone wall are apparent here ensconced in the hedgerow boundaries.


Fig. 9 Fig. 10 Entry into Moat Lane approaching from Old Kilcullen (left) and at Hacklow Cross (right). This is also most likely a remnant of the medieval landscape layout.

Fig.11 The existing carriageway looking down hill towards Halverstown Cross (below left). This road has been straightened historically. The original alignment most likely followed the townland boundary and is still clearly visible inside the roadside hedgerow to the right of the picture.

Fig.12 A proposal for a ‘Quiet Lane’ strategy for this segment from Halverstown Cross to the monument at the1798 commemoration below left .

Fig.13 The historical landscape pattern radiating out from the hill top at the round tower. The landscape pattern of the Fair Green is still an open common most likely positioned just outside the original town walls. This segment of the carriageway proposed for the ‘Quiet Lane’ strategy will be very pleasant with a restored semi natural grassland bordering the trail.

Fig. 14 . It is clear an arc is formed by the lane pattern radiating from the hill of the round tower at the ‘Barrows. The restoration of the seminatural grassland and the protection of the triangular historical space will improve its visual amenity, the attractiveness of the trail whilst providing for a shared road space (above left)

Fig. 15 Emphasising the spatial layout of the commons by maintaining the grasslands. There is excellent potential to restore the species diversity of the semi natural grassland with positive annual management. (above right)

Fig.16 A‘Quiet Lane’ will allow for safe trail use along the Fair Green and commons with QR codes indicating the likely location and appearance of the original town walls and earlier enclosures.

Fig.17 The grazed portion of the commons provides an open vista approaching from the 1798 monument.

Fig.18 Trail end / beginning. The radius of the original mound to be emphasised by retaining its open centre with light radial planting to soften the appearance of the steps and hand rail and extend the semi natural grassland from the proposed managed margin. There is an opportunity to integrate the seating in oak beam or oak stain with an integrated QR code explaining the archaeological and historical significance of the enclosure and the likely layout of the original medieval lanes near this location. .

2.2.2 Walking and Cycling Trail Use and Climate Change.

The ability to safely take exercise in one's local community without the requirement to travel by car is not only a healthy choice but is also a very efficient way of reducing carbon expenditure. Adults and children who have the choice to opt for walking or cycling at a local level generate an atmosphere conducive to social exercise, help with reducing carbon emissions and meeting reductive targets[8].

2.3 Visual Amenity and Active transport/exercise

Exercising or being outdoors whilst enjoying an interesting and stimulating landscape experience is highly beneficial. Much recent research indicates that exercising in scenery has a significantly greater positive effect on physical and mental health than exercise alone. Further, scenery categorised as "rural unpleasant" have been measured as depressing the beneficial effects of exercise on three different

[8] www.smartertravel.ie/sites/default/files/uploads/2013 Transport National Cycle Policy.pdf

measures of mood.[9] One can deduce that it "appears that threats to the countryside depicted in rural unpleasant scenes have a greater negative effect on mood than already urban unpleasant scenes."

The views along the proposed trail are generally excellent and breath taking in places. However, small tweaks to the foreground of some views will generally improve their quality. This is recommended along with work to trees and tree planting, semi natural grasslands, hedgerows and fly tipping.

Fig. 19 View to the round tower approaching the trail from Kilcullen

Fig.20 Clear view of Dun Alainne from the 'Barrows'. Visual amenity will be further improved by species enrichment of the semi natural grasslands in the foreground.

[9] https://pubmed.ncbi.nlm.nih.gov/16416750/

Fig.21 Heritage gateway view towards Old Kilcullen round tower.

Fig.22 Panoramic views from the cemetery at Old Kilcullen looking towards the Moat Lane summit (above). Moving over the landscape towards the Moat of Ardscull, Mount Leinster and the Dublin Wicklow mountains (photographs below).

Fig.23 Viewing West to South West from Old Kilcullen Cemetery


Fig. 24 Viewing South West to South from Old Kilcullen cemetery


Fig. 25 Panoramas from south west to south east to north east

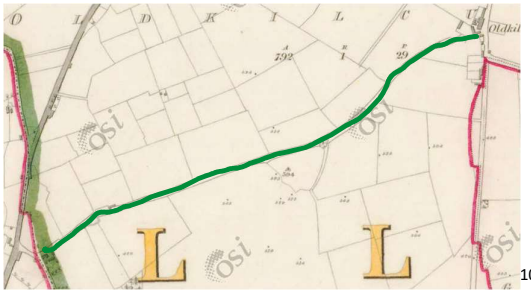

Fig. 26 Panoramic view towards the mountains with stretches of rural countryside in the foreground and middle distance. Whitethorn in the fore ground has a sculptural quality and original to the area. Short sections of repair and hedgerow infill will improve the foreground. With landowner permission samples of the local whitethorn would make an excellent nursery stock of local provenance for infill and simultaneously shape and tidy old *Crataegus monogyna* whitethorn trees.

Fig. 27 Whitethorn in the foreground will benefit from light pruning and shaping. It is also a source of quick material of local provenance for hedgerow infill.

3.0 Placenames

There are placenames and minor place names along the proposed trail along with official names and road numbers as listed in Logainm, some of which are used locally and some derived from maps. **Old Kilcullen, Sean Chill Chuillinn** refers to both the townland and locally to the surrounding area. Official local road names are L6079, L6089, L6082 and L6078.
Hacklow Cross Roads L6083 is found officially and is used locally.
From junction of L6082 and L6078 via Whitehall Cross this segment is considered for feasibility and would form part of **Lorg Lane**.
Halverstown Cross Roads along L6080 to the R448 junction is a relevant segment proposed for phase one, shared surface.
The **Fair Green** refers to the commons area north of the round tower and relevant as part of the proposed semi natural grassland restoration.

The adjoining townlands, **Glebe North** and **Glebe South** border the proposed trail.



[10]

Fig.28 Moat Lane from Hacklow Cross to Brennans Public House. This is a local name referring to the original lane.

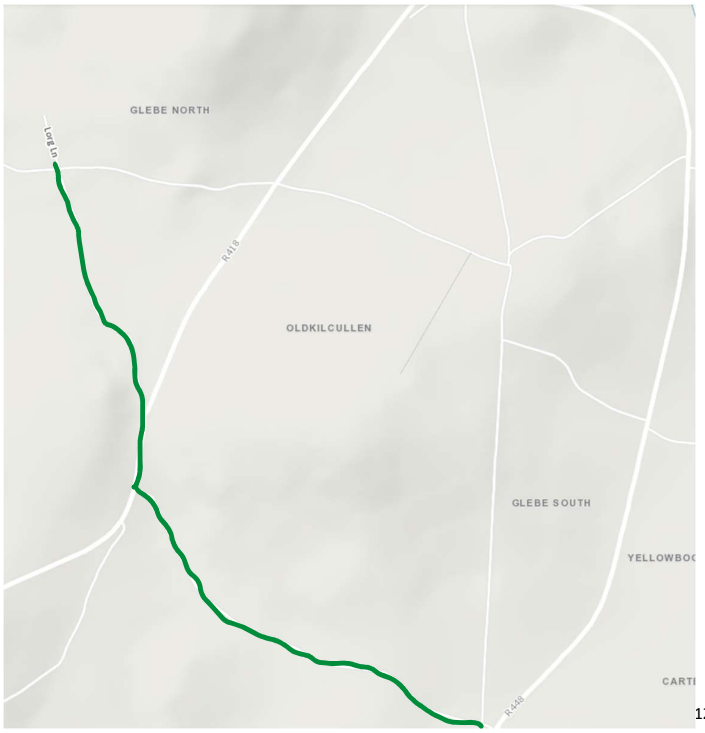
[10] OS Six Inch First Ed. Colour

[11]

FIG.29 'The Barrows' is a local name and refers to the historical triangular landscape just north of Old Kilcullen round tower

R418 the Athy Kilcullen Road, R448 the relevant segment from **Halverstown Cross** to where it returns to the junction with the R418

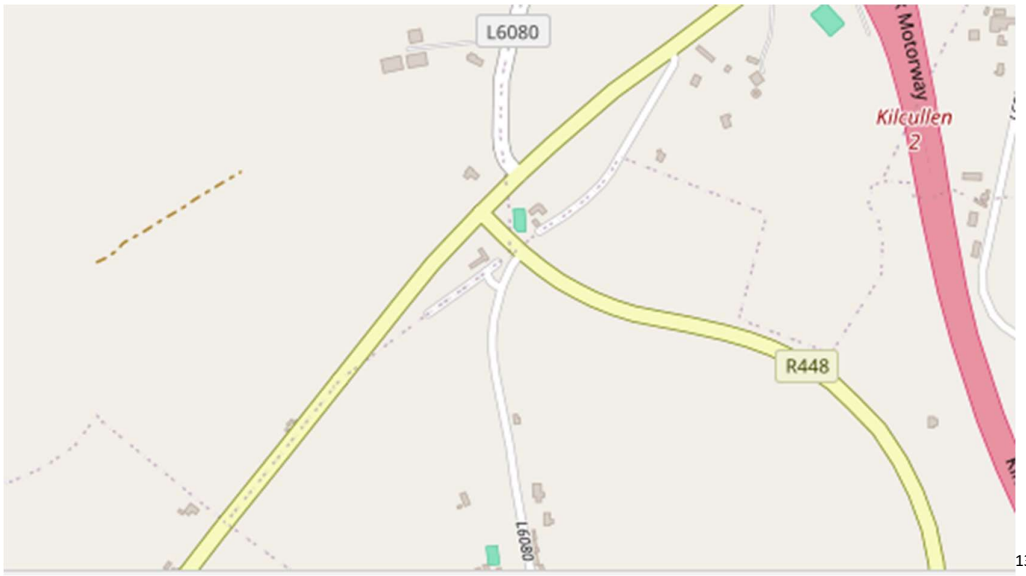
Lorg Lane ; This name does not appear to be used much locally any more but is found both on historical maps and contemporary mapping.



[12]

Fig.30 Lorg Lane

[11] OS Six inch First Ed. Black and White
[12] www.geohive.ie



[13]

Fig.31 The proposed trail will commence just south of the junction of the R448 and L6080

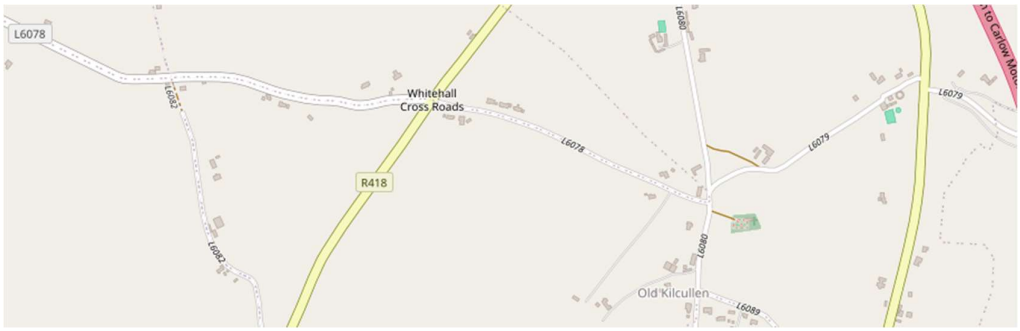


Fig.32 The neighbouring townland of **Whitehal**l and **Whitehall Cross Roads**.

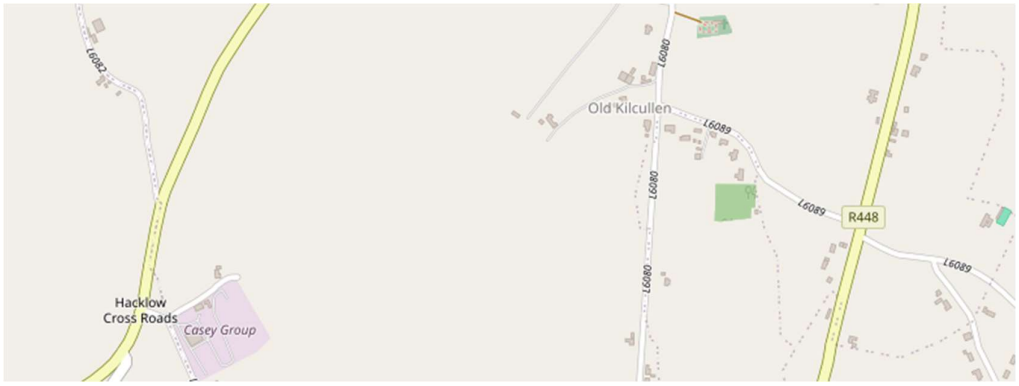


Fig.33 Local road numbers

[13] https://www.logainm.ie/en/1411903/

Fig.34 The relevant segment of L6083, from **Hacklow Cross Roads** to **Halverstown Cross Roads**, is mapped as **Lorg Lane**

4.0 Design Guidance

Over the period of the public consultation process, literature and experiences relevant to trail development both in Ireland and abroad were examined, namely;

- Universal Design Principles
- Sports Ireland Trail Standards
- Maintenance and Trail Condition
- 'Quiet Lane' Design Guidance, Experience of Traffic Calming and Monitoring Experience
- Trails, Gaps and Boundaries
- Active Transport Standards
- Signage
- Security and Passive Surveillance
- Trail Information Communication and Trail Head
- Filtered Permeability
- Semi Natural Grassland Management
- Hedgerow Management
- Archaeological Grassland Management
- Integrated Landscape Management including 'Unification of Biological Gain and Heritage Protection'
- Visual Amenity and Active Transport
- Landscape Management and Monitoring
- European Landscape Convention

Universal design principles were considered from the outset and accessibility grades were guided by expected trail standards as set out by Sports Ireland as well as branding and information required at

trail heads [14, 15, 16] including slopes and potential for universal design as laid out by the Irish Wheelchair Association[17] (multi-access areas, challenging access etc.).
Whilst gradients need to be minimised and be as gentle as possible, there is no real scope to change gradients and trail head information will advise as to the slopes that can be expected on the trail.
Maintenance condition is recognised as very important so that the non-vehicular sections are passable by all users. This is also addressed under maintenance and monitoring below.
The primary conclusion from the consultative process was that the area was very well suited to the adoption of the 'Quiet Lanes' concept. Reducing traffic speed and making rural roads safer and more comfortable for walking cycling and wheeling, allows local communities to enjoy exercise, visual amenity and attractions in a social and pleasant environment. And whilst there is no established guidelines yet for networks of 'Quiet Lanes' using local rural roads in ROI, there are good guidelines and pilot schemes established in the UK.[18]
Design guidance for trails with respect to gaps, gates and stiles is discussed below under access through field boundaries.[19] Both universal design guidance and countryside trail guidance are referenced .

4.1 Landscape, Biodiversity, Visual Amenity and Archaeological Heritage

The unification of ecological gain and heritage protection with visual amenity [20] in the overall landscape context is novel but not unique and recent studies on Iron Age oppida in France, England and Spain have all indicated a great value in an integrated landscape planning and management approach. The authors of the study recognise that in the European context "landscape is recognised as a frame through which societal values are defined and embedded" and that cultural landscape as defined by UNESCO emerged from "the need to emphasise the interconnections between natural and cultural factors in creating landscape character." [21] Also the European Landscape Convention (ELC) has "drawn more attention to the perceptive nature of landscape and the need for integrating a diverse range of stakeholders and values to ensure landscape sustainability." The authors of this study set out to identify "as part of this broader interpretation of landscape, the importance of cultural ecosystems services are perceived not as separate elements but integral to landscape biographies."

The proposal for a heritage trail can be seen as a contemporary cultural benefit whilst simultaneously arising as an ecosystem service provided by the existing landscape, landscape ecology and biodiversity. The presence of the archaeological elements in the landscape around Old Kilcullen have ensured a certain level of ecological protection to the area. It is certain that the fine field pattern of hedgerows and lightly grazed, low fertiliser seminatural grasslands would not have persisted today were it not for the presence of the archaeological elements and their cultural associations over time.

[14] http://www.irishtrails.ie/Sport_Ireland_Trails/Publications/Trail_Development/Greenway_Branding_Guidelines.pdf

[15] https://www.sportireland.ie/sites/default/files/2019-10/classification_grading_of_recreational_trails.pdf
[16] www.irishtrails.ie/National_Trails_Office/Publications/trails_ classification.pdf Guidelines on the classification and grading of recreational trails.

[17] https://www.iwa.ie/access-guidelines/great-outdoors-access-guidelines/4-trails-greenways-public-parks/
[18] https://www.cpre.org.uk/wp-content/uploads/2019/11/quiet_lanes_1.pdf
[19] BS 5709 Gaps Gates and Stiles
[20] Moore, T., Guichard, V., Álvarez-Sanchís, J., 2020/05/08 The place of archaeology in integrated cultural landscape management. Journal of European Landscapes 10.5117/JEL.2020.1.47039

[21] Journal of European Landscapes 1 (2020): 9–28 DOI 10.5117/JEL.2020.1.47039

The proposals identify elements of landscape ecology which are to be enhanced and improved as part of an integrated landscape plan. The most significant is that of the fair green and commonage area. The most northerly fenced segment indicates there is potential for a species rich grassland. This area will not be included in the grassland management proposals. A biodiversity report from 2019[22] noted the area further south, described as the hay meadow (dry meadow grassland) containing ribwort plantain and meadow buttercup with occasional red clover, yarrow, dandelion and birds foot trefoil contributed to moderate species richness.

The old meadow south of this area again is more inaccessible for mowing and hasn't benefitted from annual haymaking and is as such an unmanaged dry grassland, though there is one wet pond area on the western boundary. Herb species are low but this is likely to improve with the management of the thick tussocky thatch of dead grass. Patches of wildflowers occur within the sward including lady's bedstraw, meadow vetchling and speedwell and germander. The aim of the grassland management is to restore the grassland to a species rich meadow which is likely given the indications that a seed reserve is contained with the soil. The encroachment of bramble and gorse is to be curtailed and the hedgerow and hedgerow trees to be managed as part of the hedgerow management plan.

The triangular grassland area described locally as the Barrows has a visible circular ridge within the grassland. Again a thick thatch of tussocky grass has built up here as this area has not benefitted from annual mowing. Grass species within this area at the moment contain false oat grasses, cocks foot grass, sweet vernal grass, red fescue whilst herb species like nettle, hogweed, meadow vetchling birds foot trefoil, lady's bedstraw, creeping cinquefoil, germander speedwell, bush vetch and stitchwort frequent the area. Some rarer sightings of red clover meadow buttercup ribwort plantain and sorrel also were noted. Near the treeline rosebay willow herb and hedge woundwort were noted.

Although this grassland has moderate species richness, flora diversity occurs in localised patches indicating the potential to repair and restore the semi natural grassland.

Fig.35 *Myosotis sps.* (above) in the semi natural grassland area with left *Hyacinthoides non scripta*, bluebells next to the margin with *Primula veris*, cowslips, *Plantago sps.,* plantain, in bunches scattered throughout the roadside and semi natural grassland area. These plants are indicative of excellent potential to renew the grassland and its species riches.

[22] D'arcy, D. Old Kilcullen Biodiversity Action Plan 2019

Fig.36 *Hyacinthoides non scripta*

Fig. 37 *Primula veris*

Fig. 38 *Plantago sps.* above in the seminatural grasslands.

Fig. 39 Cow parsley, Anthriscus sylvestris on the road margins.

Fig. 40 Vetch, *Vicia sps.* at the base of the hedgerows

Good species diversity along the roadside margins is indicative of the potential to generate an extraordinarily diverse plant community along the trail.
It is the landscape management plan for the margins and the seminatural grasslands that will determine the future ability of the grasslands to renew themselves.

Future prospects from the Irish Semi Natural Grassland assessment (ISGS) [23] indicates the best methodology for increasing species richness and indicator species frequency (given many impacts for Annex 1 habitats many that don't appear at the indicated areas in Old Kilcullen). The list of impacts noted that many of the Annex I grasslands "are managed by grazing rather than by mowing. While positive effects may be obtained in the short term with appropriate grazing, the long-term effects may be less beneficial than mowing. Mowing removes litter and keeps nutrient input low, as well as giving a uniform sward structure, whereas grazing can increase nutrient inputs and, if carried out to excess, has additional undesirable effects of trampling and poaching, particularly in wet meadows. Some of the best meadows surveyed in the ISGS to date have been those that have been maintained by mowing rather than by grazing".

This certainly indicates that managing the sward by mowing at least, for the semi natural grassland areas around Old Kilcullen is an excellent opportunity to generate a very special species rich grassland which in time may prove to be very important in the country.

The principal criteria for maintaining and /or restoring semi natural grasslands are ;
• Reduce/stop nutrient inputs by fertilisers (not an issue at Old Kilcullen). This will allow more species to thrive
• If there is any grazing to occur this ought to be carried out by lighter traditional breeds

[23] http://www.botanicalenvironmental.com/wp-content/uploads/2011/10/2010_ISGS_Report_and_Appendices.pdf

• Winter grazing can be beneficial if at a very low stocking rate
• Mow late with after-graze is ideal, allowing as many species as possible to flower and set seed
•Drainage should be maintained in an ecologically sensitive way and no new drains added
•Reseeding will destroy existing vegetation.
•Annual monitoring of semi natural grasslands by selecting a series of 2m x 2m quadrants to record species diversity in spring and late summer before mowing and monitor the successes and concerns each year.

The semi natural grasslands at Old Kilcullen match GS1/GS2 of the Irish semi natural grassland survey 2007-12[24] i.e. Dry calcareous and neutral grasslands/Dry meadows and grassy verges. There is one damp pond area also which will add to the species diversity of the area.

4.2 'Quiet Lane' Definition

'Quiet Lanes' have been defined[25] as; minor rural roads or networks of minor rural roads appropriate for shared use by walkers, cyclists, horse riders and other vehicles. The aim of the Quiet Lane is to maintain the character of minor rural roads by seeking to contain rising traffic growth that is widespread in rural areas.

4.2.1 Community Involvement

The main elements of the 'Quiet Lanes' scheme relate to; (i) community involvement in particular in relation to speed reduction in the community, (ii) discouraging through traffic and (iii) 'Quiet Lane' entry and exit signs to remind drivers that they are entering a place where they can expect people to use the whole road space for a range of activities. The regulations in England [26,27] recognise that the objective of "Quiet Lanes" relate to improving and maintaining the quality of life for local residents and this should take precedence over general objectives to ease traffic movements.

4.2.2 'Quiet Lanes' in the Irish context

The DTTAS support office has produced a brief summary of the US and UK experience.[28] (Appendix 1) The aims of the 'Quiet Lanes' project is synopsised as having three key elements; community involvement to encourage a change in driver behaviour, area wide directional signage to discourage through traffic and 'Quiet Lane' entry and exit signs.

The report proposes signage options for Ireland and notes that given "the likelihood of limited verge widths and hedge encroachment onto roadside verges, it is recommended that sign face designs be as narrow as possible. It is envisaged that these signs would be used at the entry and exit points of Quiet Lanes (or networks of Quiets Lanes) with supplementary plates P080 *'Slow'* and P010 *'End'*. The use of smaller square timber marker posts or traditional finger sign posts at junctions within the networks of Quiet Lanes could be considered to reduce to overuse of larger signage in rural areas."

[24] https://www.npws.ie/sites/default/files/publications/pdf/IWM-78-Irish-semi-natural-grassland-survey.pdf
[25] Countryside Agency (UK)
[26] https://www.gov.uk/government/publications/roads-circulars/current-roads-circulars
[27] https://www.legislation.gov.uk/uksi/2006/2082/regulation/1/made

[28] DTTAS Support Office Quiet Lanes and Neighbourhood Greenways – A brief summary of the US and UK experience

4.2.3 Active Transport Standards

The proposals are cognisant of other guidelines and standards related to active transport.

Existing established standards in the Republic of Ireland pertaining to walking, wheeling and cycling were consulted.[29] [30] Document and design standards pertaining to route design with reference to rural areas were examined for shared as well as traffic free routes (e.g. National Cycle Manual). [31] Useful information from statutory Irish guidance for urban design standards for walking, signage and urban cycle routes was also considered.[32] The basic parameters for integrated active transport were considered namely; safety - to maximise road safety for all road users, coherence, directness, and attractiveness - the cycling environment along a route should be pleasant and interesting. This is particularly important for beginners, tourists and recreational cyclists. It is also recommended that cycling infrastructure should be designed , built and maintained for comfort and ease of use.

4.2.4 Signage

Statutory Irish guidance for street design and the requirement for road signage in Ireland was carefully considered as were branding and European certificates[33] in the context of minimising the amount of signage and information boards visible along the alignment. Design advice friendly to trail users from other jurisdictions was looked at and appropriate items taken on board for this study.[34],[35],[36]. The manuals devised for the Republic of Ireland with respect to the function and form of trails[37] were also examined. Trails can have many place related functions including open space, information points, meeting and gathering, recreation and in particular in the case of the Old Kilcullen trail, places of heritage and architectural value. Outcomes for 'Quiet Lanes' and active travel like walking and cycling, was considered from a variety of sources[38].

'Quiet Lane' signage should help to reinforce responsible behaviour by all users.

4.3 Experience of Traffic Calming

False cattle grids tie with the experience of the 'Quiet Lanes' project in Kent where the grids used as low key calming measures implemented at selected points (where vehicle speeds were thought to be a problem), were well received.

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[29] www.tiipublications.ie/library/DN-GEO-03047-02.pdf

[30] National Cycle Policy Framework 2009 - 2020 Department of Transport Tourism & Sport

[31] Design Manual for Urban Roads and Streets (DMURS) Department of Transport Tourism and Sport www.housing.gov.ie/sites/default/files/migrated-files/en/ Publications/Development and Housing/Planning

[32] Traffic Signs Manual Department of Transport, Tourism and Sport trafficsigns.ie/current-tsm/

[33] Eurovelo

[34] www.sustrans.org.uk/our-services/our-expertise/route-design/ sustrans-design-guidance

[35] www.cycling-embassy.dk/wp-content/uploads/2013/12/ Collection-of-Cycle-Concepts-2012.pdf

[36] Note 2/08 'Cycle Infrastructure Design' Department of Transport UK www.cycling-embassy.org.uk/sites/cycling-embassy.org.uk/files/ documents/ltn208.pdf

[37] https://www.cyclemanual.ie/manual/tools/checklist-function-form-usage/

[38] http://www.sustrans.org.uk/sites/default/files/images/files/scotland/ News/Sustrans_Scotland_walking_and_cycling_outcomes_report_

It is also recognised (UK) that low speeds can be maintained through community involvement and where 'Quiet Lanes' fit into the local road network hierarchy.
The general experience of traffic calming was examined and all relevant experiences at home and abroad were considered in deciding the best traffic calming solution for the Old Kilcullen trail. Some likely problems have been flagged from cycling on shared routes [39] namely road narrowing, vertical deflection (road humps and speed cushions) and central hatching. Apart from the inappropriate appearance of same in rural areas, they can often lead to problems if the resulting gap is not wide enough for cyclists to be overtaken safely. With a 4m average road width it would not be possible to have the required width to facilitate such a gap for this trail on shared surfaces. Considering that even a short section of cyclist bypass would absorb a large portion of the managed margin on either side of the carriageway, this has been discounted for this trail.

Vertical deflections are not suitable where they encourage weaving by cyclists unless comfortable sinusoidal humps can be provided. The Dutch experience points to sinusoidal humps as a preferred option. Again such features are often very useful in urban environments combined with flat topped humps at pedestrian crossing points but would require additional warning and appear incongruent in the setting of this project. Central hatching has been found to encourage motorists to the edge of the carriage way requiring a cyclist bypass which would again absorb much of the managed margin.

This would also appear incongruous. Similarly the UK experience [40] [41] [42]signifies the importance of (1) avoiding uneven surfaces, sections of cobblestones which cause discomfort and are slippery when wet (2) avoiding speed humps not covering the whole width of the carriageway (can result in cyclists weaving unpredictably) and (3) local changes in carriageway width can lead to conflicts in bottleneck locations. The main message in relation to shared surfaces is the avoidance of pinch points or chokes for safety reasons.

Greensand Ridge in Kent established a 'Quiet Lanes' [43] network in July 2001 between three areas: the Medway Gap, Sevenoaks and Tonbridge. Most of the network is within the Kent Downs Area of Outstanding Natural Beauty (AONB) and links historic villages with country lanes dating from Saxon times. In this way, the proposed trail at Old Kilcullen bears some similarity.

The 'Quiet Lanes' project in Kent set out to make country lanes better for local people wishing to walk, cycle and horse ride without restricting the access needs of local communities, such as farmers, local businesses and residents and to encourage the use of the lanes so that everyone travels with care and consideration for others.

Similarly in this project having considered the suitability of the network, it was concluded that the minimum physical works should be undertaken to encourage greater use by non-motorised users whilst having proper regard to safety. The project set out to make signage minimal but effective.

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[39] https://www.cycling-embassy.org.uk/sites/cycling-embassy.org.uk/files/documents/cyclingengland/2011/01/a03_traffic_calming.pdf

[40] https://toolkit.irap.org/safer-road-treatments/speed-management-and-traffic-calming/

[41] https://www.cycling-embassy.org.uk/sites/cycling-embassy.org.uk/files/documents/cyclingengland/2011/01/a03_traffic_calming.pdf

[42] https://www.satinonline.org/Documents/71-Rural-Minor-Road-Traffic-Calming---Sustrans-Routes-for-People-Information-Sheet-FF38.pdf

[43] https://www.cpre.org.uk/wp-content/uploads/2019/11/quiet_lanes_1.pdf

The design measures were developed by consultation with local residents, landowners, interest groups, engineers and stakeholders. For this project many of the traditional traffic management measures were not utilised because they would interfere with the character of the country lanes and there was a preference for unobtrusive and essential signing only. This is similar to the views expressed during the public consultation phase of the Old Kilcullen proposed trail.

The measures adopted in Kent included;

a) 'Quiet Lanes' signs mounted on simple wooden posts marking the entry and exit points of the network
b) fingerpost destination signs revised to divert through traffic away from the Quiet Lane
c) treatment to achieve a visual narrowing of the lane and to guide non-motorised users away from the edges
d) a false cattle grid of five raised parallel bars in grey with white on the edge of carriageway to draw attention to the bars
e) limited measures (e.g. improved warning signs, surfacing with a high skid resistance buff coloured surface, and end of carriageway marking) to improve safety and awareness at busy junctions.

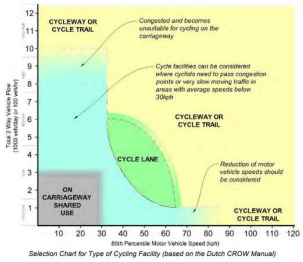
Further for traffic calming measures in Kent and Norfolk, discussions with the community led to the view that traffic calming was considered "urban" in character and was not desirable along Quiet Lanes. The cost of implementing measures across the whole network were also considered to have been prohibitive. Changes to the speed limit were rejected due to likely enforcement problems. As a result, no traffic calming measures were introduced along the Norfolk Quiet Lanes but were in the villages.

As iterated, the low key calming measures implemented in Kent at selected points where vehicle speeds were thought to be a problem (false cattle grid, made up of 5 rumble strips) were well received.

4.4 The Need to Reduce Speed.

The traffic count and design speed study examined the situation locally at Old Kilcullen and found a raised design speed in the busy early morning period when people are likely rushing to work and school. Being cognisant of the work already complete to date on shared surfaces including the cycle manual and the Dutch CROW model (see below), it is clear that for shared surfaces it is preferable to reduce this design speed to make walking and cycling comfortable and safe.

[44]

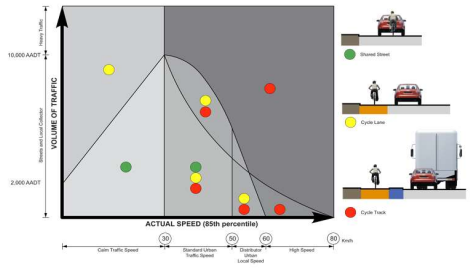


Selection Chart for Type of Cycling Facility (based on the Dutch CROW Manual)

[45]

[44] https://www.nationaltransport.ie/wp-content/uploads/2021/02/English_01_Written_Report.pdf pg 22

[45] cyclemanual.ie



Having looked at all the options on traffic calming in the context of 'Quiet Lanes' and the studies on shared surfaces, *False cattle grids,* which consisted of five rumble strips crossing the full width of the carriageway, came out as the most appropriate traffic calming measure from a rural character and a road safety perspective.

4.5 Non-motorised Users and Security- Passive Surveillance

Best practice for trail design suggests that route alignments should avoid creating places that are enclosed or not overlooked. For this trail, discussions from the outset have discounted the use of additional lighting and security cameras. Both elements will add another dimension to the project and another layer of incongruity to the rural landscape. Trails that are predominantly natural are the most appreciated. The most incongruent elements in the landscape surrounding the proposed trail alignments are the communications mast, the crane hire facility at Hacklow and the presence of the quarry at Halverstown. The communications mast was most cited as a security concern in the area.

4.6 Filtered Permeability

The community expressed preference for filtered permeability, a planning concept that would "filter out" through car traffic on the selected section. This would not only increase security but would create a more attractive environment for walking and cycling, while maintaining accessibility for local inhabitants, deliveries or emergencies. Current guidelines were consulted. [46] Staggered gates with adequate clearance have been chosen to achieve filtered permeability. Signage at the Hacklow end of the road will provide information and advise of a dead end with exceptions for pedestrians, cyclists and equines.

[47] Fig. 41Filtered permeability signage

[46] https://www.nationaltransport.ie/wp-content/uploads/2011/12/Permeability_Best_Practice_Guide_NTA_20151.pdf

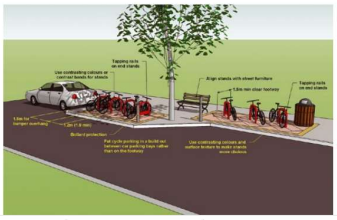
[47] Dead end signs with exceptions for cyclists and pedestrians in Belgium (left) and Germany (right).

The use of unbound compacted stone and dust as a surface in this section makes this a very economical and feasible option allowing for adequate budget to achieve all the aims and ambitions of the trail objectives. Edges along this segment to be supported as appropriate to the expected level of usage and occasional access by maintenance and emergency vehicles with landscape turf to provide a soft edge.

Any stripped topsoil from species rich grassy edges to be covered and stored . This topsoil will contain a species-rich seed bank and should be utilised, where possible, as backfill or landscaping material and allowed to regenerate naturally. There may be enough seed reserve in the soil to act as a biodiverse soft turf edge.

4.7 Trail Head

The trail head is to be situated near the entrance to the round tower with a single stainless steel information board and space for three secure bicycle stands set slightly across the slope, outlined to provide tactile information as to their location . The information board will be accessible set at a height for all to see and with tactile information for visually impaired.



[48] Fig. Trail head bicycle park

The central information board will indicate the location of all the significant historical and archaeological features in the landscape as well as their interaction with features of ecological interest and significance. It will also indicate where QR codes are located along the trail with all relevant information at specific locations.

[49] Fig. 43 Downloadable interactive guide

[48] www.camcycle.org.uk

[49] Image of interactive guide for Bagendon and downloadable guide to Salmonsbury (Greystones).

The studies below[50] have used downloadable and interactive guides to great effect in Greystones and Salmonsbury, UK. Whilst landscapes can be examined explored or described at a variety of scales, the study also backs up the findings that "most stakeholders engage with it (landscape) at a relatively localised scale". The distribution of QR codes at various intervals along the trail allows for this.

The simplicity of the trail head will not draw any attention away from the main features defining the landscape character and is designed to be minimalistic in intervention but conscious of users. Examples of this space were examined both in the urban and rural context and this informs the positioning and security of bicycle stands. A stainless steel curved cycle stand was selected to have the same strength and security as the 'Sheffield' stand, but with curvature displaying a little more sensitivity to the landscape context.

4.8 Suitability Criteria

With the emphasis on 'Quiet Lanes' the suitability criteria for utilising this concept was examined. Suitability criteria employed for designating a 'Quiet Lane'[51] generally requires a low volume of traffic carried daily (no greater than 1000 vehicles per day), a slow speed, a narrow road , rural in character and area involving the local community to effect a change in behaviour and help reduce vehicular speed. The Essex highways report notes that "designation as a Quiet Lane does not bring about any enforceable restrictions nor does designation prohibit use by any types of vehicle or regulate their speed. The sign reminds users of the types of traffic they will be expected to see and encourages them to respect each other." From a legislative perspective and practical implementation it cannot be expected that there will be any enforcement of low speed requirements and this is reflected in UK legislation[52] , [53]and the impact of the 'Quiet Lanes" at local level. [54]

Criteria that other local authorities in England[55] have used to designate quiet roads include:

- narrow, unlined rural roads, on average no more than 4m wide
- daily traffic volumes of less than 800 vehicles
- speed limits to be implemented in line with existing speeds, that is, 85th percentile measurements or where perceived speeds are already below 30mph or 40mph
- routes already used by pedestrians, cyclists and equestrians

or as is the case for Clackmanshire, Perth and Ross, the main features of designated quiet roads in forming an active travel network were:

[50] Journal of European Landscapes 1 (2020): 9–28 DOI 10.5117/JEL.2020.1.47039

[51] https://www.essexhighways.org/uploads/lhp/mg/11_ecclhpmembersguidequietlanesb.pdf

[52] https://www.thenbs.com/PublicationIndex/documents/details?Pub=DFT&DocID=279611

[53] These Regulations may be cited as the Quiet Lanes and Home Zones (England) Regulations 2006 and shall come into force on 21st August 2006. These Regulations apply to England.

[54] Creation and Impact of Quiet Roads Mechanisms to support alternatives to car use in rural areas Enquiry No. 2020/1126 Eoin McLoughlin, Senior Parliamentary Researcher, Economics 18 December 2020

[55] https://westlothian.gov.uk/quiet-roads

- Reduced speed limits, to either 40mph or 30mph
- Gateway signage to remind vehicle drivers of the likely presence of non-motorised users on the road

4.9 'Quiet Lanes' Monitoring Experience

Kent County Council[56] has monitored two key elements: behaviour (by measuring traffic counts, speed measurements or video surveys) and attitudes (by surveys or focus groups). Kent County Council is extremely pleased with the demonstration project which was monitored after two years. It was well received and hugely community driven. Some results indicate that vehicle flow was 13 % lower on weekends after a year and comparing to counts between 1999-2001, pedestrian numbers were higher by 72% on week days and 89% on weekends. Similarly weekday flow of cyclists on the Quiet Lanes increased by around 75% between counts, although weekend flows were down by 31%.

85% of the community were in favour of the scheme in year one and year two, with the scheme generally being recognised as very successful in establishing networks which can be used by walkers, cyclists and horse riders. It was ascertained that keeping vehicle speeds and flows at low levels will be essential in encouraging non-motorised users to use the network.

Specifically 'Quiet Lanes' around the Greensand Ridge, in Kent (Kent County Council 2002) measured changes in flows and speeds (both mean and 85th percentile were lower) and attitudinal changes over a one year and three year period. Perceptions of safety and increased pedestrian, cyclist and equine use of the lanes was measured as were perceptions of decreased vehicular speed.

It was felt that drivers in the area being more aware drove with caution on the selected roads in the area. An advertising campaign to raise awareness was undertaken to reinforce driver behaviour.
The second scheme in southern Norfolk wasn't as successful where 'rat running' was an issue with no features to discourage this habit.

In general representatives felt that where a scheme was implemented, it was respected by the public in the area.

In general it was recognised that low speeds and low traffic flows can be maintained through community involvement where 'Quiet Lanes' fit into the local road network hierarchy with suitable alternative diversion routes.

5.0 Consultation

5.1 Consultation to Concept Feasibility to Preliminary design

Consultation was a combination of face to face meetings, on line meetings, meetings with committee and general members of the OKACA. The information gathered was fed into the concept generated for the trail alignment. Further discussion and feedback at each step resulted in the evolution of the initial concept. This was distilled down to the preliminary design.

56 https://trimis.ec.europa.eu/sites/default/files/project/documents/20060811_105435_59990_UG315_Final_Report.pdf

Public consultation fed into the iterative design approach. Members of the Old Kilcullen Area Community Association (OKACA), met with the consultants and KCC Parks Department at the outset.

General open discussions with OKACA and within the community formed the basis of the initial proposals. The proposals were discussed with the community and feedback informed subsequent sets of revisions. This was by meetings and conversations with landowners ,community members, stakeholders and KCC departments including formal meeting 7/10/22, 9/11/22, 16/2/'23, 2/3/'23 4/7/'23 and a public meeting 11/3/'23 and a follow up meeting with OKACA July '23.

Key stake holder consultation included consultation with land owners, Departments of Kildare County Council and Irish Water, telecom service providers, Vantage Towers (formerly Vodaphone) and Comreg, and heritage services. All bodies were invited to discuss or air opinions and concerns. The KCC Parks Department facilitated meetings within the authority with detailed advice notes and considerations provided for the project, particularly from the Heritage Officer and with respect to road safety from the Roads Dept. (Appendix 1). Some affected landowners thoroughly engaged with the process and others didn't engage at all. All stakeholders were made aware of or invited to participate in the public consultation process and meetings. Feedback from all the stakeholders informed the direction of the project.

5.2 Integrated Landscape Planning- Public Meeting Presentation

The principle of integrated landscape planning formed the basis of the presentations at the public meeting. This was distilled from the stakeholder consultation, the public consultation, design revisions and the design guidance as discussed above. The initial landscape analysis formed the basis of the concept of tying landscape archaeology, landscape as an amenity and landscape ecology with a heritage trail. The feedback from the public on the day indicated an appreciation of this approach. Most people were very happy to see an approach which united landscape, biodiversity, visual amenity and archaeological protection with the practical implementation of a safe trail. This is in line with design guidance whereby; the unification of ecological gain and heritage protection with visual amenity [57] in the overall landscape context recognises landscape "as a frame through which societal values are defined and embedded" and that cultural landscape as defined by UNESCO emerge from "the need to emphasise the interconnections between natural and cultural factors in creating landscape character." [58] This also concurs with the strategies of the European Landscape Convention (ELC) which draws "more attention to the perceptive nature of landscape and the need for integrating a diverse range of stakeholders and values to ensure landscape sustainability." The experience on the day of the public meeting was a strong indication that on a local level as was the case with ELC research, people identified with a broader interpretation of landscape and "the importance of cultural ecosystems services are perceived not as separate elements but integral to landscape biographies."

5.3 Landscape, Biodiversity, Visual Amenity and Archaeological Heritage

The proposals on the day were for a heritage trail as a contemporary cultural and an ecosystem service provided by the existing landscape, landscape ecology and biodiversity with the presence of the

[57] Moore, T., Guichard, V., Álvarez-Sanchís, J., 2020/05/08 The place of archaeology in integrated cultural landscape management. Journal of European Landscapes 10.5117/JEL.2020.1.47039

[58] Journal of European Landscapes 1 (2020): 9–28 DOI 10.5117/JEL.2020.1.47039

archaeological elements in the landscape around Old Kilcullen. The latter having ensured a certain level of ecological protection to the area. Thus an integrated approach to biodiversity and heritage protection was proposed. As iterated the fine field pattern of hedgerows and lightly grazed, low fertiliser seminatural grasslands would not have persisted today were it not for the presence of the archaeological elements and their cultural associations over time.

The proposals identify elements of landscape ecology which are to be enhanced and improved as part of an integrated landscape plan. The most significant is that of the fair green and commonage area.

The undulating old meadow hasn't benefitted from annual haymaking and is currently an unmanaged dry grassland with one wet pond area on the western boundary with low herb species. The proposals include the management of the thick tussocky dead grass here and to restore the species riches of the semi natural grassland. Restoration of the meadow is likely given the indications that a seed reserve is contained within the soil locally. The encroachment of bramble and gorse is to be curtailed and the hedgerow and hedgerow trees to be managed as part of the hedgerow management plan. Pollinating trees and native crab apples are to be added to the hedgerows as appropriate.

The triangular grassland area described locally as the Barrows has a visible circular ridge within the grassland. Again a thick thatch of tussocky grass has built up here as this area has not benefitted from annual mowing. A similar management strategy will bring back the meadow species here and along with road safety measures protect the spatial integrity of the historical landscape.

Good existing species diversity along the roadside margins is indicative of the potential to generate an extraordinarily diverse plant community along the trail.

The proposals presented to the public recognise that the landscape management plan for the margins and the seminatural grasslands that will determine the future ability of the grasslands to renew themselves.

5.4 'Quiet Lane' Concept

A 'Quiet Lane' strategy formed part of the proposals presented at the public meeting. 'Quiet Lanes' have been defined[59] as; minor rural roads or networks of minor rural roads appropriate for shared use by walkers, cyclists, horse riders and other vehicles. The aim of the Quiet Lane strategy is to maintain the character of the minor rural road by seeking to contain rising traffic growth that is nowadays widespread in rural areas.

All the options discussed and the initial analysis (Appendix 2) were presented to the general public at a public meeting at Halverstown National School. A large crowd in excess of thirty people attended and the feedback was generally very positive. Most attendees expressed delight at the prospect and appreciated the integration of heritage, biodiversity, landscape quality, visual amenity with the 'Quiet Lanes' concept. Indeed there was great support for the measures to protect and rejuvenate hedgerows and walls. There is already a large number of people in the community who recognise the significance of their hedgerows and who simply want the correct information as to how to rejuvenate them. Interest was also expressed in the propagation of hedgerow material from original provenance. This is very interesting as it indicates a strong appetite for protecting hedgerows from the introduction of biosecurity risks to local habitats. There was an appreciation expressed by many members of the public on the day that the trail presented an opportunity to identify, restore and protect many facets of the rural landscape and in particular those unique to Old Kilcullen.

[59] Countryside Agency (UK)

Again families of landowners connected to the Moat Lane expressed concern at this aspect of the proposed trail reiterating the concerns expressed at earlier meetings. One person was concerned at the concentration of parking on reinforced grass near her home, citing security concerns This has since been addressed and the orientation of the reinforced spaces changed to diminish the concentration. Reinforced grass will simultaneously prevent erosion at the edge of the commons, allow for enabled parking, whilst protecting the semi-natural grasslands of the commons. Other people present on the day were pleased to see how the proposals could address current security concerns and appreciated the potential for increased passive surveillance. Many people were very pleased to think that the area was safer for walking especially with young children.

An open comment sheet also allowed for members of the public to voice their opinions. Sample of the comments included;" Nice idea if done " well, "looks thoroughly well thought out and hope it will be safe", "An extraordinarily ambitious project! Would be a wonderful resource for residents and visitors. An outdoor classroom for students and historians. A brilliant opportunity to bring history, landscape and diversity together. Well done and thanks." "Excellent with great potential looking forward to progress". Concern expressed that "rights of way that were there for years and are now blocked off with gates" and "open Hacklow -Carlow road to one way traffic" and "why have a car park, why is it needed". Other comments "super work – hope it all comes to fruition", "wonderful initiative and not before its time".

Following development of the proposals a meeting with members of OKACA indicated aspects of the proposals where they had concern and areas that were positively received.

6.0 Outcomes

Taking everything into consideration ie.; public consultation, background research, feedback and comments from the iterative process the outcomes can be categorised under the headings below.

6.1 Unfeasible Segments

At an early stage the feasibility of including a segment North West of Hacklow and Whitehall Cross (see sheet 1 appendix 1) was discounted primarily due to the difficulty crossing the R418 would present to pedestrians at these two points on a busy road. All crossing solutions considered were likely to be expensive, disruptive, impactful and unsupported at a local level.

Fig. 44 Difficulty crossing the R418 makes this segment unfeasible.

6.2 Engagement and Security

Landowners expressed concerns with respect to security, animal welfare and the potential impact of large numbers of trail users on their properties. Concern was expressed particularly in relation to the Moat Lane, where there have been problems associated with the telecoms infrastructure, making the lane a security concern at night. There were concerns raised in relation to dogs and equines on the lane especially around lambing time. Local farmers have also pointed out that there has been a disengagement generally over recent years in relation to everyday farming operations and people are now unaware of what constitutes normal agricultural practice.

The telecommunications mast has attracted activity and possible security solutions were discussed with local telecoms engineers who pointed to the successful use of technology at other sites in filtering access near masts. Telecommunications engineers will need access to the mast. Comreg will need to access the mast occasionally to check electromagnetic radiation levels. This information directed the first draft concept plans which were further discussed with the community.

6.3 Passive Surveillance and Filtered Permeability

Discussions with the community with respect to safety and general local observations gave the feedback below;

People felt safe walking from Halverstown Crossroads to the Round Tower to the 1798 monument as this stretch was largely overlooked from nearby houses and enjoyed a high degree of passive surveillance.

People weren't happy to have the currently disused section of road open to vehicles (Lorg Lane, between Halverstown Cross and Hacklow) as this would lead to increased penetration of the community and filtered access was preferable allowing only vehicular access for emergency vehicles. Any additional tree planting on this section to avoid creating a tunnel like effect. Members of the community expressed a preference to having the northern side of the road open to the hill.
The width of the non- vehicular section was discussed and it was felt that to return the road to its original width would not emphasise that it was non-vehicular. Width of a route should be based on the level of anticipated usage, allowing for growth. A 3m minimum width corresponds to much newly build active infrastructure as well as considering the level of anticipated usage and emergency access.

6.4 Tree Planting; Maintaining Landscape Character, Increasing Visual Amenity, Biodiversity and Carbon Sequestration

The possibility of increased planting was discussed at Halverstown crossroads to prevent fly tipping. This was welcomed so long as the sight lines to the R448 were undisturbed.

6.4.1.Pollinators

Members of the community expressed a wish to see a greater number of pollinating fruit trees in the community. This is addressed with infill planting with *Malus sylvestris* crab apple and *Sorbus acuparia* Rowan in the hedgerows where such is required and in planning ahead to replace ash where they will likely decline from the hedgerow as a hedgerow tree over the coming years.

Following public meetings, members of the public contacted the consultants expressing concern with respect to tree planting. The concerns related to;

Concerns of Crop Damage and Tree Planting

Increased cereal crop take due to crow damage was voiced as a concern. Taking crows and rooks together as a group described as corvids Teagasc[60] has advised that birds and crows "can damage late sown crops particularly where seed is not properly covered. Loss pre harvest is not a problem in standing crops". Crows present a problem to cereal growers at seeding stage and seeding depth needs to be considered. Tall trees with stout branches provide the best habitat for corvids as they require height for vantage points and safety. Young trees are not used as rookeries due to their unsuitability and are very unlikely to generate an increase in corvid populations. The risk to crops from new tree planting is insignificant. The likely hood of rookeries developing in newly planted trees is low.

6.5 Biodiversity semi natural Grasslands

It was pointed out that an earlier study into local biodiversity had already been complete and this included some work on the areas of semi-natural grasslands. This was examined and the recommendations also fed into these proposals.

6.6 Moat Lane

The key problematic issue related to access to the Moat Lane. Some landowners along this lane were unhappy to have a trail close to land and homes, others are happy to see the progress of a heritage trail. Other people expressed concern that the open lane was now closed to access.

6.7 Parking

- Members of the community expressed concern that there wouldn't be sufficient car parking spaces in the community if the trail became popular with visitors. Concerns were expressed that parking would occur at gates and on road verges. However, it is not expected that the proposed heritage trail would attract motorists. It was felt that the trail was primarily aimed at local people who wouldn't need vehicles to avail of the facility. The possibility of using the current roads depot at Halverstown Crossroads was also identified as a potential site if it were ever required in the future.

- The community formally returned a series of feedback points including parking. Parking proposals were considered unnecessary, however the parking proposed is also a method of protecting the semi natural grassland edge from erosion and is therefore simultaneously serving another function.

6.8 Hedgerow Management and Hedge Cutting

The feedback from the public was very positive in relation to proposals for a hedgerow maintenance and management strategy coinciding with the trail. At the public meeting it was proposed the hedgerows could be restored to emphasise the radial pattern of the landscape. Most people expressed a strong desire to know more about traditional hedgerow laying techniques. A lot of garden owners and land owners wanted practical information on how they could go about hedge laying on their own property. Similarly many people wanted more information about propagating their own infill hedging from local source and provenance.

[60] https://www.teagasc.ie/media/website/publications/2009/WheatProduction.pdf

One landowner expressed concern at the difficulty of hedge cutting with the proposed tree planting. This is addressed in the plan by identifying the areas directly behind tree planting which will need localised maintenance allowing ease of use of hedge cutting machinery.

Over management of hedgerows came back as an issue in the ecological consultation report. This is best handled as part of the integrated landscape management strategy addressing invasive species in particular *Clematis vitalba* which will completely cover sections of the hedgerow if allowed to take hold. Treating Old Mans Beard and letting the hedgerow recover and thicken, again infilling with whitethorn as required, will ensure the longevity of the hedgerow.

6.9 Property Values

Fear of decrease in property value due to the presence of the heritage trail was expressed however the evidence from the USA has shown a mean 20% increase in property price premium adjacent to greenways. [6162] Other local authorities have advised an expected increase in property prices adjacent to trails and greenways.[63]

6.10 Road Safety

The community formally returned a series of feedback points. These are addressed as follows;

- **False Cattle Grids**
  A redesign of the false cattle grids was requested as it was felt it was an 'over engineered solution' . False cattle grids in the revised proposals are white 100mm thick lines at 200mm spacings. Specified rumble strips are not to be used to protect residential amenity. Discrete signage and hedgerow measures (for which a preference was expressed) remain integral to the overall landscape and biodiversity plan.

- **Road Safety**
  Road safety on the narrow surface areas between the tower car park and Brennans pub and towards the northern end of the commonage was a concern and the community queried if it were possible to widen the surface here. However it is also within the realm of the national monument (National monument No.71)[64]. Wall repair at the cemetery will require Ministerial consent. It would not be advisable to move or interfere with the walls surrounding the national monument. The proposals address road safety in this area (refer engineering drawings Detailed Layout 05 Old Kilcullen Round Tower and Brennans Public House between L6078 and L6080) with yellow road marking lining each side of the carriageway vehicle area. This creates an informal pathway with a low holly hedge protecting pedestrians from vehicles emerging from the existing car parking area. This addresses vulnerable road users at this location.

[61] https://headwaterseconomics.org/trail/26-impact-greenways-property-values-austin/
[62] https://college.agrilife.org/rptsweb/wp-content/uploads/sites/21/2019/10/Impact-Greenways-and-Trails.pdf
[63] http://www.traleefenitgreenway.com/benifits
[64] www.archaeology.ie

- **Surfaces**
  Road repairs and surfacing are recommended as appropriate over the length of the proposed alignment.

6.11 Stone Walls

- A desire was expressed by members of the community to see repairs to the stone wall network aligned with the trail and cemetery. It is proposed the stone walls are to be repaired to the highest standard as appropriate for heritage walls utilising lime mortars and organised to a stone conservators / conservation structural engineer's plan . This is also advised as part of the archaeological measures.
- Stone walls are also valuable biodiverse refuges. There are some invasive Sedum on the walls but also some valuable native Sedum. It is difficult to tell them apart. The native species as well as ivy leaved toad flax and harts tongue fern are best kept where possible during restoration whilst Sedum album will need to be removed.

6.12 Integrated Landscape Management Plan

The community expressed concern at the management and maintenance of the trail post construction.

- An integrated landscape management plan is highly recommended post construction. This will also include traffic safety and surveying to determine successes in traffic calming. It will include surveying for the effectiveness of passive surveillance and security, biodiversity measures and landscape measures. It will require a detailed landscape management plan broken down by season. The landscape management plan will integrate archaeology and the spatial organisation of the wider radial landscape. An integrated approach will by necessity require a large amount of input from the community and the local authority. A detailed integrated landscape maintenance plan will have to identify each item of maintenance, surveying and identify the person/body/ company responsible for each item and the timing of the operation.

6.13 Key Concerns and Key Valued Proposals Synopsis

Speaking with individual members of the community, the community group and the stakeholders, the key issues of concern identified were;

- Security
- Road Safety – shared surfaces
- Concern at attracting large numbers of visitors
- Farm and farm animal security
- Permeability
- Clutter
- Loss of landscape character and rural identity
- Public Right of Way

Speaking with individual members of the community, the community group and the stakeholders, the key valued proposals were;

- Increase in visual amenity
- Increase in local security

- Decrease in traffic speed and an increase in the safety of vulnerable road users.
- Filtered permeability
- The orientation of the trail in conjunction with the archaeological, historical and spatial landscape pattern.
- The orientation of the trail with ameliorated landscape quality, visual amenity and increased biodiversity
- The potential amelioration of local biodiversity through a focus on native plant planting and semi natural grassland and landscape management.
- An opportunity for garden owners and landowners to avail of workshops based on appropriate hedge and hedgerow restoration and management
- An opportunity to organise/ propagate hedgerow plant material from existing indigenous plant materials in Old Kilcullen guaranteeing the provenance of the planting stock.
- The protection and rejuvenation of historical local walls to the highest heritage standards.
- The generation of an outdoor class room through localised information points utilising QR codes to minimise clutter and maximise the potential information relayed.
- The generation of virtual reality displays from QR points to indicate the original appearance of the high crosses and the round tower in the landscape and the possible appearance of the walled town in medieval times.
- The use of QR codes to indicate where and what is being viewed in the landscape eg Dun Alainne, the peaks in the Dublin Wicklow Mountains, Mount Leinster etc.
- Proposals for a detailed integrated landscape management plan post construction.

7.0 Solutions

Positive feedback as well as all concerns were considered. The landscape analysis revealed a strong connection between the underlying topography, hill top summits, the position of the monastic site and round tower, the archaeological monuments, barrows, townland boundaries, the hedgerows and semi-natural grasslands of the fair green and commons.

7.1 Landscape Spatial Relationship

The spatial relationship is fine and well-articulated in the landscape. The cultural landscape is itself the greatest repository attaching to ecological value in the area. By strengthening the hedgerows and stone walls defining the roads, fields and commons, biodiversity heritage and spatial value are addressed together.

The medieval lanes that led from the original walled town define the layout of Old Kilcullen today. There is a sense of change moving from one space to another passing along the lanes which not only contributes to enjoyment and the visual amenity experience but also triggers a sense of how the space was divided historically as a walled town. It was recognised that in this landscape there is a need to communicate the depth of history attached to the spaces.

The challenge is to communicate all the multi-layered, complex, information about the area without detracting from its landscape character, reinforcing the same character, addressing security and safety concerns, ameliorating and protecting biodiversity whilst simultaneously generating a pleasant trail that will allow local people to exercise close to home in a sociable, attractive amenity.

7.2 Quiet Lanes

Over the course of the stakeholder consultation, the ‘Quiet Lanes’ pilot projects were discussed. KCC roads department supplied information relating to the experience in the US and UK of ‘Quiet Lanes’.

It became apparent that the 'Quiet Lanes' concept would not only deal with the challenges presented by shared surfaces and mixed use of the lanes for recreation but could also address the fears expressed of urbanising the character of the local landscape. The possibility of reducing speed without removing vehicular access became apparent to all involved in the local community. The positioning of the entry and exit points to the lanes also marks in a sense significant entry points to Old Kilcullen. This adds a sense of enclosure to the community, reflecting somewhat its historical evolution from a walled town.

The reduction of speed and the increase in safety will make it attractive for local people of all ages to enjoy walking, hacking, cycling and running in a social way. The greater the number of local people taking exercise and visible on the proposed trail, the fewer the security incidences will be experienced.

7.3 Signage and QR codes

Marking significant points in the landscape along the trail and at seating areas with QR codes enables a huge amount of information to be relayed to trail users. The information is to be well curated and relevant to the place and at convenient and natural stopping points. This will minimise clutter and signage.

Where permissive access and parking is relevant, signage is to indicate that this is the case. This will occur where landowners voluntarily provide access to paths and parking.

Fig.45 Permissive Access signage

Quiet Lane signage at gateway entry points and at selected areas along the road will also indicate that motorists can expect to finds people exercising on shared surfaces.

7.4 Phasing

The discussions with the community indicated that a phased approach to the trail would be preferable, allowing a chance to demonstrate all the positive benefits of the proposals to the community. This is also recommended[65] . The public rights of way and Local Authority Development Plan advises, "A collaborative and engaging approach with landowners and community groups is a preferred approach" and finding solutions to right of ways which might consider alternatives "such as better pedestrian ways along public roads and acquisition of land for the provision of public parks."

The phases identified were;

Phase 1 An extension of the 'Quiet Lanes' concept to the 1798 monument approaching the junction to the R448, to Halverstown Crossroads. This segment of the trail passing by the round tower as the trail head, the barrows archaeological monument, views to Dun Ailinne, the fair green, the semi-natural grasslands of the commons with information points and seating along the way. Measures also included along this segment will enhance visual amenity and biodiversity. There was a segment of reinforced grass proposed to repair and prevent further erosion at the edge of the commons and this was to double as parking space.

[65] Office of the Planning Regulator, 2021, Public Rights of Way and the Local Authority Development Plan; A Survey Report on the Operation of Section 10(2)(o) of the Planning Act

Phase 2 From Halverstown Crossroads to Hacklow. This segment to have filtered permeability with a non- vehicular section. Measures included along this segment will also include visual amenity and biodiversity amelioration, protection and enhancement.

Phase 3 From Hacklow to the Round Tower over the Moat Lane. This is the most controversial segment and doesn't currently have the support of all landowner families. (See Heritage Trail Dwg No. KKOKP121002r. and OKSL01).

Signage at the Hacklow end of the road will provide information and advise of a dead end with exceptions for pedestrians, cyclists and equines.

[66] Fig. 46 Filtered Access Signage

7.5 Surfaces

The use of unbound compacted stone and dust as a surface in this section makes this a very economical and feasible option allowing for adequate budget to achieve all the aims and ambitions of the trail objectives. Edges along this segment to be supported as appropriate to the expected level of usage and occasional access by maintenance and emergency vehicles with landscape turf to provide a soft edge.

7.6 Biodiversity Gain

- The management of the hedgerows along the trail and near the trail will greatly benefit biodiversity connectedness at a landscape ecology scale for many years ahead.
- Tree replacement in hedgerows and identifying potential hedgerow trees to be managed as such, will compensate for the loss of ash in the landscape in the coming years.
- New tree planting as well as providing visual amenity in years to come will act as a carbon sink for a period in excess of 100 years.
- Ensuring there is diversity in species planted and monitoring for disease and biosecurity risks reduces the impact of events where they occur.
- Managing invasive plant species stops their spread as well as allowing the plant populations they suppress to strengthen.
- Planting pollinating trees, increasing hedgerow infill and planting herbs will benefit pollinating insects at a local level.
- The restoration of the semi natural grasslands will protect a very special and rare habitat and sward at both county and national level. This will result in time in an increase in wildflowers and species diversity which will also benefit pollinating insects.

[66] Dead end signs with exceptions for cyclists and pedestrians in Belgium (left) and Germany (right).

- Utilising the existing topsoil from species rich grassy edges as backfill and turfing material will contain a species-rich seed bank which will regenerate naturally as a soft turf edge.

  (Drawing No.s OKLB01r2 OKLB02 r1 OKLB03 RBr1 and detail sheets Alignment Segment AB1-AB9 C and BC)

8.0 Recommendations and Design Proposals

8.0.1 Phasing

Phase 1 and Phase 2 as outlined above to be combined to form the first phase of the heritage trail with the 'Moat Lane' not included for the first phase.

Trail – Combination of Shared Surface and Non Vehicular Trail

- The route will be accessed as a shared surface from the approach to the R448 at the 1798 monument to Halverstown Crossroads. It will be accessed as a filtered trail along a portion of Lorg Lane towards Hacklow with vehicular access being restricted to emergency vehicles. From there to Hacklow Cross the surface will also be shared. The trail will easily be accessed directly from most households in the area to avail of approximately 5-6km of daily exercise and social interaction. (Dwg No. KKOKP121002r OKSL01)
- Staggered gates will ensure both safety emerging from the non-vehicular segment of the trail to the shared surface. It will also prevent vehicular access except for emergency or maintenance vehicles. Drawing OKSAB1001
- The 'Quiet Road' prescribes a managed margin and false cattle grids to make shared surfaces safe and to calm traffic in a manner that does not appear incongruous in the rural setting of Old Kilcullen.

Road Safety

- The recommendations for road safety were devised by Dooley Cummins Architects and Engineers[67]. The examination of the existing traffic volumes and design speed indicated a need for traffic calming. 'Quiet Lanes', 'Gateway Zones' and 'False Cattle Grids' were recommended as an appropriate measure to slow traffic. Civil Drawings 01-04
- Entry to the "Quiet Lane" area is to be signalled at "Gateways". Sentinel signs shall be provided which identify that road users are entering a Quiet Lane. "Share Space" signage will also signal that vulnerable road users are also using the carriageway ahead.
- It is proposed to use buff coloured resin bound Calcined Bauxite for 10m at the 'Gateway' design in this scheme. This provides a high friction surface at the junctions with the R448 and signals the entry to the Quiet Lane zone.
- Rumble Strips
- Following consultation the false cattle grids will be used but rumble strips are not to be used at specified locations to protect residential amenity. (Civil Drawing No 01/04 and 01/02 detailed layout sheets 01-03).
- Quiet Road Signage
- Following consultation road 'Quiet Road' safety signs can be mounted onto oak or steel railing where 1.8m wide step in margin can be provided. This will allow the signage to have a reduced visual impact on areas of the landscape with a more open aspect e.g the Fair Green or the approach from Halverstown Cross roads. (Civil Drawing No 01/04 and 01/02 detailed layout sheets 01-03).

[67] Appendix 3 Dooley Cummins Architects Engineers Old Kilcullen Heritage Trail Engineering Report

Managed Margins

- The primary method of improving vulnerable road user (VRU) safety along the route is to improve the condition of the existing verges. The verges shall be levelled, raked and seed to generally provide 2.0m wide margins where possible. The margins shall not be less than 1.2m. Where road cuts are encountered or required they shall be filled level with the surfaces with drainage stone to avoid trip hazards.
- Care is required when developing the managed margin around the Barrow north of the Old Kilcullen Round Tower site as it is the site of a National Monument and is a protected site. The development of the margin in this area will not involve excavation.

Crossing Points

- The verge widths along the route are not of adequate width to allow users to walk on the left hand side in each direction. For this reason it is necessary to identify informal VRU crossing points which provide good sight distance and vehicle VRU intervisibility. The recommendations show intervisibility triangles from these crossing points. The crossing points are uncontrolled and unmarked. The crossing points shall be signalled by the condition of the margins on both sides and shall be obvious to road users.
- **Sight Intervisibility**
- The traffic survey carried out identified the design speed (85th percentile vehicle speed) as 75 kph. The appropriate stopping sight distance is 90m at a setback of 2.0m.
- These passive recommendations are easy to implement, monitor and amend
- **Road Markings and Verge Lines**
- Road markings shall be used to provide passive traffic calming and also to separate road users where appropriate.
- In the area adjacent to Brennan's Public House the road verges are of limited width and are not suitable for the development of managed margins for VRUs. For this reason it is proposed to provide yellow broken carriageway edge lining along the carriageway surface in this area to define the carriageway travel lane. The verge adjacent to the car parking area serving Brennan's public house shall be repaired and surface dressed to act as an informal footway separated from the carriageway travel lane by the verge marking.

8.0.2 Planting

- It is also proposed to provide a new hedge alongside this car parking area to control the entry and exit points to the car parking area which is currently unbounded. Integrating road safety with landscape amelioration and biological gain this hedge will be evergreen holly which is culturally appropriate and a native plant planted onto a low bank with young oak anticipating the eventual demise of the mature trees nearby. .
- Holly *Ilex aquifolium* is used as infill material in the hedges where possible and in the planting schemes . Where possible it is recommended this be propagated from local provenance.
- Planting at the gateway at the 1798 enclosure bank is to be cognisant of sight lines and will reduce the dependence on gorse for visual amenity. Planting will include holly, guelder rose *Viburnum opulus,* Spindle *Euonymus europaeus* birch *Betula pendula,* Alder *Alnus glutinosa* and swathes of bluebells *Hyacinthhoides non scripta* planted in a radius emanating from the centre of the enclosure.
- Softening in necessary signage along the route holly and rowan, *Sorbus acuparia* are used.
- Infill planting of *Prunus avium* wild cherry, rowan and crab *Malus sylvestris* are used in the hedgerows along the trail as well as *Crataegus monogyna* whitethorn *Prunus spinosa* sloe spindle holly and hazel Corylus *avellana..* Climax trees are planted in where a hedgerow tree cannot be trained - Oak *Quercus petraea, Quercus robur* beech *Fagus sylvatica.* are infilled as required . Sycamore is allowed to emerge out of the hedgerow where a good specimen is likely to emerge.

- A new planting of sessile oak English oak and beech will be planted on the approach to Halverstown Cross to compensate for future losses in the mature stands of ash in the area.
- All along the route where there is a possibility supplementary planting of bluebells *Hyacinthoides non scripta* and snow drops *Galanthus nivalis* will add greatly to the visual amenity of the trail from early to late spring.
- Grassland sward will have supplementary seeding with yellow rattle to increase wild flower proliferation.
- Along the proposed non vehicular segment of the trail tree and hedgerow planting will occur on the southern side of the trail only.
- Disturbed soil post construction in this segment is to be seeded with oxeye daisy *Leucanrthemum vulgare*, corn poppy *Papaver rhoeas*, and corn marigold *Glenionis segetum* all of Irish provenance to provide a colourful display in the first year post construction until the soil seed reserve establishes itself.
  At Halverstown Cross with sight lines protected planting swathes of bluebells and snowdrops at the lower levels , gorse as an edge plant with holly yew and hazel as understory, the opportunity to plant crab apple trees, wild cherry trees, oak trees and beech trees is availed of. This will project a very positive gateway image of the trail as well as planting to prevent fly tipping and to increase the screening of the maintenance depot.
  Planters filled with medieval plants and prostrate rosemary are recommended to further screen the depot gate.
  The same list of pollinating medieval medicinal plants will replace the planting at the stone planter at the trail head near the round tower.

8.0.3 Parking and Erosion

- Following consultation and road traffic audit parking at the round tower is to be supplemented by a slender reinforced grass area at the edge of the semi natural grassland. This will also serve to protect the edge of the semi natural grasslands from erosion. Pedestrians are to be routed around reinforced grass when vehicles are accessing or leaving the space. Three bicycle parks are to be instated at the trail head near the entrance to the round tower.
- spaces are to be provided parallel to the carriageway and shall be separated by the managed margin walking route to ensure safe vehicle access and egress away from the carriageway. The spaces and managed margins shall be reinforced with Grass Reinforcing Grids on a sub base layer on a geotextile membrane.
- Control of unauthorized car parking at the Halverstown Junction with the R448 and at the Barrow shall be provided in the form of 0.75m high 0.25m x 0.25m oak bollards.

8.1 Trail Head and Orientation

- The trail head is to be located at the entrance to the round tower and cemetery. A polished stainless steel information board universally designed with tactile surfaces to accommodate all trail users, will orientate trail users to specific locations relaying information via carefully positioned QR codes along the trail.
- There will be a stainless steel cycle park with a textured limestone/granite surface to indicate the presence of a change of function with an edge for visually impaired people accessing the information board. The remaining surfaces to be repaired.
- The cycle stand will be parallel to the carriageway and set across the slope.
- The stone planter is to be replanted with medieval medicinal plants associated with monasteries . (e.g. Ledburgh monastery Scotland). A detailed planting plan from the selection below is recommended. Many of the plants are also excellent pollinators;
- Lemon balm *Melissa officinalis* counter sunk in a baseless container *Mentha suaveolens,* monks herb, similarly countersunk, also for *Mentha piperita* peppermint, *Oreganum vulgare*

Oregano *Oreganum majorana,* Marjoram, *Thymus serphyllum* Wild thyme, *Thymus vulgaris*, Common thyme, *Symphytum officinale* Comfrey (bone set) planted countersunk , *Salvia officinalis*, Sage *Viola tricolour* Heartsease Pansy, *Digitalis sps.* Foxglove, Anise *Pimpinella anisum,* Betony *Stachys officinalis,* Hyssop, *Hyssopus officinalis,* Rue *Ruta graveolens*, Dill *Anthemum graveolens*, Cumin *Cuminum cyminum*, Cotton lavender *Santolina chamaecyparisssus* , Marigold *Callendula officinalis* , *Scutterleria gariculata* Skullcap.

- Once planted from a detailed planting plan, all will require inclusion in a landscape management plan to ensure their presentation is always optimal at the trail head.
- **QR information Points**
- The information at each QR location will be relayed in a layered manner. and very well curated. The landscape at each point will be described with key information. Views will be described, 3D illustrations of the original high crosses and round tower will be brought up, as will the likely appearance of the medieval walled town and Fair Green at each location. A layer of information will describe the underlying geology, topography, soils and the relationship between the landscape and the archaeological elements in the area. The historical landscape will be described at each location with 3D imagery illustrating the appropriate archaeological/historical features in time. Trees, wildflowers and in particular semi natural grasslands species will relay information at each location with respect to plant species and the biodiversity they support at that location. This can be changed each year as species diversity increases.

8.2 Seating and Signage

The recommended seating will be of a solid oak beam which will store carbon and have a historical reference. There will be a back rest and arm rest. Existing seating can be redesigned and stained/ painted in oak or replaced with the same oak beam to have design unity in the scheme. The seating will also be the location of the scannable QR codes. Oak posts will carry the QR codes at other points.

8.3 Heritage Gateway and Art

Heritage gateway points are added to increase the sense of enclosure to the area. They will approximately mark the walled town and are placed where there is more than 600mm space available between the post and the carriage edge. They will supplement the approach to the trail though not part of the actual trail itself. A small art trail will complement the trail objectives as well as ensuring spaces like Halverstown Cross are obviously intentionally cared for and this will ensure it is not subject to continued fly tipping. A design unity in a range of small pieces will reflect the medieval origins of Old Kilcullen. Heritage gateway and art pieces will add a new cultural layer to the trail and strengthen its visual wealth.

8.4 Integrated Landscape Planning

The landscape recommendations for the trail are at both the landscape planning and design scale. To be feasible the trail must be attractive. The landscape recommendations protect and conserve the archaeology along the trail as well as protecting and enhancing landscape and biodiversity.

8.4.1 Grassland archaeology and semi natural grasslands

It is proposed that the method for semi-natural grassland restoration and the management of the grassland archaeology and historical landscapes are integrated. To that end the following principles of managing grassland archaeology[68] are recommended;

Traffic and heavy machinery is discouraged near sensitive archaeological areas. There is to be no grazing where there are elements of exposed soil or loose stone visible. Digging near monuments is not to occur and any plans to disturb soil will require consent from the National Monuments Service. All works to have consent from the National Monuments service.

In the future if there is to be any grazing near monuments it is to be with light stock e.g. Dexters weanlings or yearlings or sheep and not in wet weather conditions. Grazing only to occur in good dry conditions. On slopes in particular the grass cover near monuments or over enclosures is to be protected and treated as a protective layer for the underlying archaeology. Grazing is to be brief and only enough to prevent overgrown and dead grass.

Bramble and Scrub Encroachment
Bramble and scrub will have to be tackled at the very beginning. If left unchecked bramble and scrub like blackthorn and willow will likely take over the semi natural grassland area. The initial control measures will pay off subsequently making the meadow far easier to manage. Normal annual meadow and hedgerow management will then suffice in keeping bramble and scrub under control. Bramble and scrub control can be integrated with hedgerow management in the first instance. Normal meadow mowing practices will control bramble, blackthorn and willow thereafter.

Mowing
Mowing semi natural grasslands is the best way of ensuring their continuation and species diversity. Whilst there may be some initial benefits from grazing, mowing in the medium to long term will be the most effective way of restoring and maintaining semi natural grasslands. Noxious and pernicious weeds are to be controlled and pulled during the year to make this a feasible and viable option. Patch seeding in yellow rattle will help reduce the dominance of perennial rye grasses where they have come to dominate the sward and increase the amount of wildflowers appearing in the meadow. The thick tussocky grass will have to be removed initially to get the meadows back and restore an annual mowing regime. Once seed has fallen the hay needs to be removed to avoid adding nutrients to the soil.

Machinery
The use of light machinery which will allow meadow like harvesting on awkward slopes and a late mow will simultaneously protect the archaeological grasslands and the semi natural grasslands. Any reseeding to be spot treatment and from the harvested seed of the existing meadow stand. Power scythes, Austrian upland biodiversity mowers and or small 'Billy Goat' mowers will have to be trialled to ascertain which is the most practical implement or combination of implements to mow the grasslands on an annual basis with the object of restoring meadow species diversity and removing hay.

Low nutrient Management and seeding
The management of semi natural grasslands is dependent on a low nutrient input and no reseeding. Where it is desirable to reduce the dominance of perennial rye grass or to infill bare soil, yellow rattle seed will successfully increase wild flower content of the sward over time.

[68] www. Managing Grassland Archaeology Farming Rathcroghan.html

Seed Bank
Any stripped topsoil from species rich grassy edges to be covered and stored . This topsoil will contain a species-rich seed bank and should be utilised, where possible, as backfill or landscaping material and allowed to regenerate naturally. There may be enough seed reserve in the soil to act as a biodiverse soft turf edge.

8.4.2 Hedgerows

Hedgerows play a very important role in the proposals not only with respect to biodiversity but as discussed in the way they define the finely articulated landscapes around Old Kilcullen and demarcating its historical landscape pattern. The hedgerows mark the townland boundaries, the original layout of the medieval lanes as well as emphasising the division of space in a fundamentally radial pattern. The design proposals recommend a metre by metre detailed plan for the hedgerows which run along the trail alignment to ensure their longevity for a period of at least fifty years.

Garden Hedges

Private garden hedges along the trail will play an important part in visual amenity, biodiversity and the control of invasive species. Where it is desired they be replaced a suitable native hedge is best considered as well as holly and pollinating trees.

Hedges and hedgerows bordering the trail alignment

It is proposed that hedgerows bordering the trail alignment be layed infilled and or treated for invasive plant species in the first instance as part of the overall trail proposals and subsequently managed as part of an overall integrated landscape management plan.

Provenance Propagation at source from local material

The hedgerow infill materials are best propagated from local sources. As advised workshops will fulfil a training function in this respect but a good quantity will need to be made available for infill quicks and tree replacement material over the next coming years. The first step is to identify likely original sources for harvesting original propagation material ideally during pruning, laying or hedge cutting. Harvesting is to be done in a manner that does not damage but rather increases the density of the hedge/hedgerow. Where local garden owners/land owners are interested they can do the propagation themselves otherwise this work may have to contracted out to local nurseries who can identify disease free space for propagation and guarantee not to spread disease or other biosecurity security risks to the hedgerows. Whitethorn, hazel and holly identified locally will be particularly valuable over the coming years as infill hedgerow material.

Compensate for the loss of ash to date and expected complete loss over the next 20 years

The identification of tree species within the hedgerow which can be allowed to take over the climax role of ash is proposed. The tree species are to be trained as hedgerow trees. This will also include crab apple and rowan as valuable pollinators. Oak and beech will also be infilled where there is no obvious existing replacement for ash. There may be no other choice but to allow sycamore to develop as a hedgerow tree in many locations.

Integrated landscape and hedgerow management to also address invasive plant species

The integrated approach will remove invasive species from the hedgerow over a period of five years and monitor the hedgerows after that to ensure there are no new invasive plant materials appearing

in the hedgerows. A long term plan is to be devised with garden owner agreement to replace laurel and snowberry hedges along the alignment. In the short to medium term a risk management approach will ensure that neat hedges will not spread beyond the owners boundaries. Where Japanese Knotweed appears it is to be treated in hedgerows for at least five years until it is controlled. Where Old Mans Beard is starting to dominate overmanaged hedges it is to be treated whilst integrating a better management solution with respect to over management of hedgerow segments. Infilling may also be required.

Hedgerows indicating historical radial pattern and landowner field hedgerows

Many of the hedgerows and lanes which demarcate a strong radial pattern do not bound the proposed trail and are in exclusive private ownership. It is proposed that members of the community who would like to participate in a hedgerow management and plant material propagation workshop or series of workshops/ annual events be invited along and form a subcommittee of the community association. The aim would be to restore the hedgerows as traditional stock proof fencing which would also restore the well-articulated landscape pattern. Sources of financial assistance will need to be investigated for this.

The integrated landscape approach recommended would necessarily see the hedgerow encroachment onto the commons and fair green managed as part of the hedgerow renewal until control is established. Once woody material and bramble encroachment is controlled onto the semi natural grasslands, annual mowing will be sufficient to control bramble and scrub.

QR code and hedgerows

Hedgerows are very important in the overall landscape ecology providing valuable corridors for genetic and wider ecological transport and interaction. QR codes positioned to indicate a medieval lane rest point or archaeological feature can also carry information identifying plant material contained in the hedgerow at that point. Young tree planting requires staking in the first few years. QR codes can also be added to the tree stakes identifying the species and their significance to wider biodiversity.

Coordination Post Construction

The landscape department of Kildare County Council will be best placed to coordinate an integrated trail plan and subsequent integrated landscape management plan which will oversee the amelioration of the hedgerows and hedges along the alignment and in the area. Input from the biodiversity officer will monitor the increase in ecological value each year as the hedgerows recover.

Fig. 47 *Malus sylvestris* in the roadside hedgerow

Fig. 48 Bramble encroachment from the hedgerow into the semi natural grasslands

Fig.49 Hedgerow trees will need to be selected from within the hedgerow to develop over the coming years to replace ash. Bramble encroachment and hedgerow rejuvenation can be managed together.

Fig 50 Tree planting or selecting from within the hedgerow for climax hedgerow species other than ash will be required to ensure the longevity of the hedgerows

Fig. 51 Infilling and or laying the mature hedgerows to ensure their longevity for a period of more than 50 years

Fig. 52 Good species diversity in the hedgerows and plenty of pollinating plant material, whitethorn and crab in flower.

Fig. 54 Management of the hedgerows aims to ensure their longevity. This will also define the spatial construct of the landscape and preventing bramble and scrub encroachment onto the semi natural grasslands, as in the example below left.

Fig. 55(above right) Managing the hedgerow and damp pool above for longevity and to keep the definition of the commonage space. There will be a need to continue to manage the commonage as a meadow to prevent the loss of semi natural grasslands. Unmanaged it will result in a loss of species diversity

Fig.56 Close to the fenced segment of the commonage, coppicing and willow spiling will allow for a managed margin and safety for road users on the road bend.

Fig.57 Along Lorg lane there is a lot of work required to repair the hedgerow and screen the quarry. This will be very open eventually once all the ash die out. Oak, Crab, Rowan and some beech will be needed to provide tree height, plant diversity, screening and secure visual amenity along this stretch of the alignment.

8.4.3 Invasive Species

Invasive species are best managed as part of the integrated landscape management approach. There is no choice with high risk invasive species like Japanese knotweed *Reynoutria japonica* syn. *Fallopia japonica* but to treat with a glyphosate based product usually carefully applied or stem injected with signage erected to indicate the management of the species. The landscape management plan will iterate the need to treat the regrowth and note where it occurs each spring /summer as it emerges. This persistence over a period of five years will be vital in gaining control over the species each year. Professional horticulturists with the appropriate registered plant protection qualifications will be required for this operation. Japanese Knotweed has to potential to be damaging to older foundations and buildings near Brennans Public House, if unmanaged

Stem Injection requires a high concentration of the active ingredient. A specialist herbicide injection tool injects the herbicide directly between the first and second nodule into each cane (approximately 20-30cms from the base). Subsequently approximately 10mls of herbicide mix is injected into each cane at a ratio of 5:1 through the use of a specialist stem injection tool. The application of glyphosate based products, are most effective when applied between the beginning and middle of September when the stems are obvious and the plant still actively growing. Given that the spread of rhizomes can be up to 7m underground it is not advised to have any disturbance of the existing car park at Brennans public house or the soil surrounding whilst there is a danger of spreading rhizomes via soil disturbance. Fresh soil from a clean uncontaminated source to BS 3882:2015 will be required for the proposed low holly hedge. Site hygiene, the minimisation of movement of machinery and only the use of clean machines and plant over the course of all works will prevent the introduction of rhizomes from outside sources.

Fig. 58 Japanese Knotweed (below)

Fig. 59 Laurel in the stone planter near the round tower entrance

Integrated landscape management will ensure the removal of laurel *Prunus laurocerasus* near the entrance to the round tower due to its invasive properties and its ability to affect the stone wall. This

will require all parts of the laurel to be removed carefully so as not to affect the wall. The replacement of the planting along this wall will simultaneously provide a better plant mix from a beneficial pollinator perspective and appropriate to the landscape character of the setting. The proposals ensure the removal of laurel and the replacement of planting with medieval medicinal plants.

Cherry Laurel (*Prunus laurocerasus*) is listed by the National Biodiversity Data Centre as a highly invasive plant species and can cause damage to young woodlands similar to *Rhododendron ponticum* allowing only established climax species to survive. Cherry laurel is a dense thicket forming invasive ever-green shrub of gardens and parks. The leaves are thick, dense and have cyanide poisonous properties. If unmanaged it is very troublesome damaging low wall foundations with its dense winter and summer shade not allowing other species to compete for light or establish themselves. As a hedge species it is well managed along the route alignment but as part of the overall hedgerow management strategy, a medium to long term plan, focused on its eventual replacement in agreement with garden owners would be the best solution. In the short term it is to be managed as a neat hedge and its spread prevented either from abandonment or mismanagement of garden waste.

Fig. 60 A neat laurel hedge along the proposed alignment.

Fig. 61 Cotoneaster sps. in the hedgerow margin

A small patch of cotoneaster, *Cotoneaster sps.* in the vicinity of the cross roads near the round tower entrance will also benefit from replacement with bluebells, cowslips, primroses, snowdrops and brizia which are visually more appropriate and will address the future potential of Cotoneaster to be invasive in the area. It is best to cut back and treat this patch of Cotoneaster. Stem treatment and stump treatment combined with a dye will make it easier to identify any missed stems in the subsequent years. It will likely take two years to gain control of the patch but it is small and easily managed. It is

best to take control of the species between April -September when it is actively growing. [69]All arisings will need to be removed and destroyed to prevent spread by seed.

Travellers Joy *Clematis vitalba,* was noted in the study area in the hedgerow. Over management of hedgerows often allows *Clematis vitalba* to take hold. *Cotoneaster sps.* and *Clematis vitalba* are on the Invasive Species Ireland Amber List of invasive species. [7071] Clematis vitalba can be a skin irritant and appropriate PPE to be used in its management. Complete removal of *Clematis vitalba* from a site may take a number of years. A combination of physical and chemical control measures is generally considered the most effective. Small seedlings can be readily pulled by hand. Larger stems can be cut and pulled by hand once the foliage has dried. It is important that hanging vines do not touch the ground causing asexual spread and seed kept off clothes tools and machinery so hygiene at hedgerow management is very important with only clean machinery used and seeds not transported from area to area. Control will require continued monitoring and follow-up over a number of years to deal with re-growth and subsequent seedling germination.[72] The overmanaged section of hedgerow needs to be allowed to rejuvenate via laying or infill planting so that it is vigorous and strong enough to withstand continuous *Clematis vitalba* invasion.

Fig. 62 Sedum album on the wall of the round tower cemetery. Allowed to remain it will push out native Sedum acre and Sedum anglicum.

A good example of the benefit of integrated landscape management would be the case for managing invasive *Sedum album* above, which can outcompete native *Sedum anglicum* and biting stonecrop *Sedum acre* . *Asplenium cetarach*, rustyback fern, along with lichens are beneficial wall flora whilst *Crataegus monogyna* , whitethorn, a native hedgerow species is excellent in hedgerows but will damage walls in the short to medium term. The archaeological importance of the cemetery walls as well as their significance in the cultural landscape and spatial definition, warrants their maintenance and restoration. The restoration will require removing *Sedum album* whilst retaining *Sedum anglicum* and *Sedum acre* which will require skilled identification of the species prior to work on the wall.

[69] https://www.nonnativespecies.org/assets/OGN-239-Controlling-cotoneaster.pdf
[70] https://species.biodiversityireland.ie/profile.php
[71] Reynolds, S.C.P. (2002) A catalogue of alien plants in Ireland. National Botanic Gardens. Glasnevin, Dublin.
[72] https://Assets gov.ie department of food and marine

Fig. 63 *Symphoricarpus albus* snowberry hedge neatly maintained approaching Halverstown Cross.

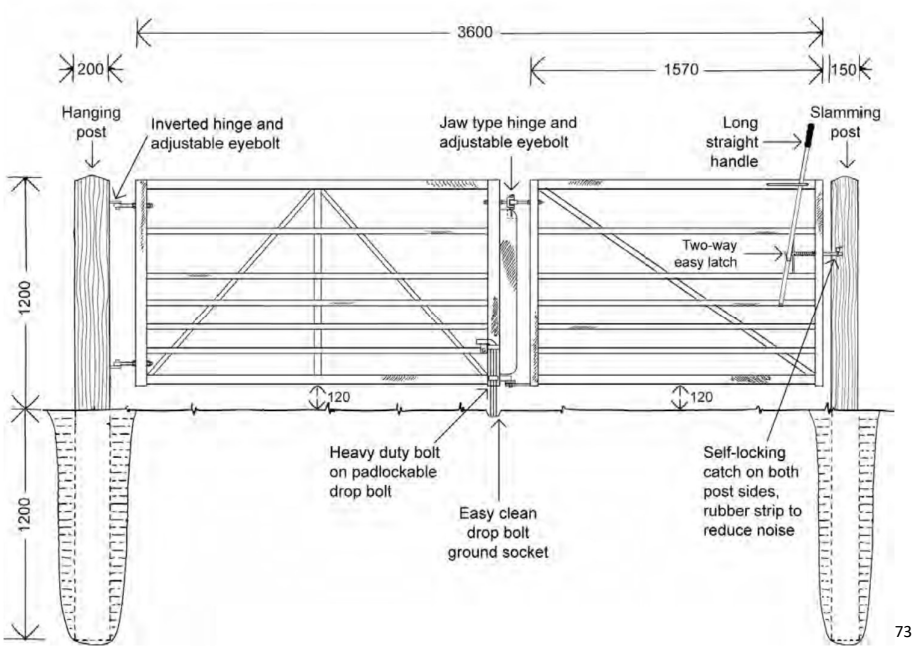
Symphoricarpus albus is a medium risk invasive species traditionally planted as a garden hedge. It is a risk where it can dominate native woodland. The prolific growth of suckers will result in the spread of the species. However, given it is maintained as a neat garden hedge where it appears along the alignment and it is also a source of food for wild birds, the best solution in this context is to manage the hedge and ensure it does not spread. The overall strategy would be to slowly replace it with a mixed species neat native hedge over time but unlike Japanese knotweed, it isn't an immediate priority.

8.5 Access Through Lane Boundaries BS 5709

Access through field boundaries is not relevant for the first phase of the proposals but is discussed here as it may in the future become relevant should the Moat Lane be considered part of the trail. There would be a need to restrict animal movement and allow for normal farming practices whilst allowing for potential users cross the space. The British standard BS 5709 is a good guide in this respect recognising that no one structure which provides access through a field boundary is suitable in all situations with no one solution being mandatory and many variations being acceptable site specifically. The main thrust of the standard is that the least restrictive option be chosen. In order of preference this would equate to (i) gap, (ii) gate (iii) kissing gate (iv) stile. Where a gap is insufficient for land management or other purposes, installing a two-way opening gate is the preferred option. An assessment of reasonableness is carried out if a gap is not maintained and a structure is put across a path. A metal two in one, two way self-closing gate as in the example below with a stock proof handle would suit the lane above the mast. It allows for the expectation that livestock are regularly grazing nearby.

A fenced margin restoring the lane alignment in the field with reinforced grass underfoot, will allow for a reasonable pedestrian passage whilst allowing for the presence of animals.

A digital smart gate solution at the end of the lane will allow vehicular entry and egress onto the L6080 whilst a simple gap will allow pedestrian access.



[73]

8.6 Monitoring, Maintenance and Management – An Integrated Landscape Approach

The success of trails often depends on how well it is maintained. The maintenance condition of non-vehicular sections is very important so that the trail is always passable by all users. Landscape maintenance including hedges and in particular tree maintenance along the alignment will be important to get as many years as possible from mature stands and to keep the route free of debris and branches following storm conditions etc.

In addition, it will be necessary to monitor the efficacy of all the measures post construction to establish how well each is working in particular traffic calming and road safety. This period of monitoring will give valuable feedback to the maintenance planning of the trail.

For the non-vehicular section of the proposed trail, maintenance will ensure that surfaces will be suitable for all users, irrespective of age, ability or mobility needs. The surfaces will need to be maintained in a condition that is free of undulations, rutting and potholes. The surfaces will be free draining with no ponding at the edges of the trail.

The margins will require maintenance on a regular basis which includes grass cutting and repair of vehicle rutting. Ongoing monitoring of the managed margins may suggest that other measures are required to protect the margin for vehicle tracking which may include edge protection, edge reinforcement or vehicle lay-by's. Vehicle lay-by's are not being employed initially as they act as a traffic calming measure in their own right.

The use of the crossing points shall be monitored by interviewing VRUs. Where issues with understanding of the informal crossing points is encountered bespoke signage shall be provided at the crossings

[73] Paths for All Scottish Natural Heritage

8.6.1 Landscape Quality and Visual Amenity

All landscape measures will need maintenance and monitoring especially at the early stages until establishment is secured. Managing hedgerows, trees and grasslands in a manner that increases their ecological value and increases their worth to ecosystem and heritage services will also necessarily need to address visual amenity. All problems relating to maintenance will need to be addressed promptly and with as much involvement from the community as possible. As iterated, the most attractive trails are those that are most respected and well maintained. This will include general landscape operations planting, pruning, irrigation, timely mowing, managing semi-natural grasslands, hedgerow management and replanting, laying etc. It will also include litter management, fly tipping and grass tipping and wall repair.

8.6.2 Security

Monitoring and surveys will measure the improvement to security locally and feedback will indicate where additional measures are needed.

8.6.3 Landscape and Biodiversity Gain

To ensure an increase in landscape quality, visual amenity and biodiversity gain a landscape maintenance plan will be required to ensure landscape maintenance is effective in (1) keeping the trail clear and user friendly (2) ensuring planted and natural materials employed in the project are thriving and have all nutritional and irrigation requirements met along with pruning weeding trimming and similar operations (3) landscape management measures are meeting the biodiversity gain ambitions of the project (4) the responsibility for each maintenance measure is identified, the frequency of the operation and any coordination necessary for successful implementation between relevant persons or bodies is identified.

The maintenance plan will commence during the development process. Construction quality will be optimum to minimise future maintenance needs. With this in mind all new planting are kept well clear of the trail. The arboriculture report identifies trees which will need surgery or maintenance to minimise issues pertinent to keeping the trail clear. Recommendations for trail maintenance will follow Sports Ireland trail maintenance guidance.[74]

8.6.4 Monitoring, Landscape and Biodiversity Gain

Examples of projects [75] (Greener Greenways) which monitor the enrichment of local biodiversity indicate the interrelationship between active transport (walking, hacking, wheeling and cycling) and biodiversity. The potential to protect and enhance wildlife and biodiversity on traffic free networks was examined between 2013 and 2019 (UK wide). The ability of linear spaces to address habitat loss by habitat fragmentation, climate change and changes to agricultural practices is often overlooked. It is also possible to monitor the effect of this trail and measure the benefits and flag changes to landscape management practices which will be required to ensure the success of the scheme. The linear scheme can increase and improve biodiversity along the alignment. Monitoring the conservation gain and

[74] www.irishtrails.ie/National_Trails_Office/Publications/ Management_Standards_Access.pdf Basic guidelines for developing/ managing recreational trails. Classification and Grading for Recreational Trails National Trails Office

[75] https://www.sustrans.org.uk/our-blog/projects/2019/uk-wide/greener-greenways-the-project-that-defined-how-we-work-with-wildlife

improvement to wildlife will by necessity involve the community, citizen scientists and perhaps local schools in surveying the trail.

Evidence gathered by Sustrans in the UK has indicated that the more beautiful and engaging a route is the more it is protected, loved and respected by those who use it. Citizen scientist information gathering is also a social engagement which can make the daily walk engaging and intergenerational. Frequent monitoring and formulating a methodology, fact checking with identified landscape ecologists and specialists, will provide a blueprint for other communities wishing to develop a trail or 'Quiet Lane' network. Landscape management practices which are mindful of biodiversity requirements and seasonal maintenance can be tweaked each year following an evaluation of local biodiversity gains.

Fig 64 The rate of ash die back and the success of replacement hedgerow trees will require monitoring over the coming years to examine the success of the integrated landscape management approach and to keep the trail clear following storms.

Fig. 65 Managing bramble and scrub encroachment will initially be best conducted with hedgerow laying and management and afterwards as part of the annual mowing regime. As for any meadow, noxious weeds, pernicious weeds and bramble will have to be removed during the growing season to ensure a healthy, diverse sward. Specific quadrants checked annually before mowing will indicate the success of the management plan.

Fig 66 The 'Barrows' has great potential to be managed as a semi natural and archaeological grassland simultaneously. This will allow for historical landscape protection and an increase in sward diversity at the same time. The greater number of wildflowers expected every year will also increase visual amenity along the heritage trail.

8.6.5 'Quiet Lanes' Monitoring

Similar to the experience discussed above relating to the Kent County Councils monitoring of behaviour and attitudes to 'Quiet Roads', the maintenance strategy will have to include surveying and monitoring of driving behaviour. After two years this will have to be appraised and the results will reflect how road safety will feed into an integrated management plan.

8.7 Leave No Trace and Countryside Code

One of the key stumbling blocks identified as part of the community consultation process was a fear expressed by local farmers that visitors to the area would generate problems with livestock and day to day farming operations. The Leave No Trace movement has been successful in Ireland in addressing many of these concerns. The Countryside Code[76] in UK has also provided some good pointers in successfully managing trails.

The following principles of the Leave No Trace movement[77] will be pertinent to the monitoring and management phase of the trail - Be Considerate of Others, Leave What You Find, Respect Farm Animals and Wildlife, Dispose of Waste Properly and Minimise the Effects of Fire.

8.7.1 Leave No Trace Actions

Temporary Signage

Whilst it is desirable to minimise signage and clutter, the experience in Scotland suggests that plenty of temporary signage attached to gates and fencing at the outset directs the behaviour of visitors to the area. Once an etiquette is established there is little need to continue to use the signs except to remind visitors of seasonal activity etc.

[76] https://www.gov.uk/government/publications/the-countryside-code/the-countryside-code-advice-for-countryside-visitors

[77] www.leavenotraceireland.org/seven-principles

Be Considerate of Others. Temporary signage attached to gates and QR codes added to or near gate posts can be utilised to outline the following;

• Respect the people who live and work in the countryside. QR information on all QR codes.

• Park appropriately - avoid blocking gateways or narrow roads. Reminders that farm machinery, local residents and the emergency services may need access at all times. A laminated sign simply attached to key gates with uniform agreed graphics for the Old Kilcullen area.

• Take care not to damage property, especially walls, fences and crops. This information on all QR codes and agreed laminated signs attached to gates when cereal crops are establishing before harvest in particular gates where people have been known to enter fields uninvited in the past.

• Respect other visitors and protect the quality of their experience. QR code information.

• Let nature's sounds prevail. Keep noise to a minimum. This hasn't been reported as an issue to date but temporary signage with agreed graphics can be prepared in advance and positioned where any future noise nuisance is identified.

Canine Control

Dogs to be kept under close control. Advice that no dogs or equines are to be brought onto private farmland. Temporary signage and advice on QR codes that dogs must be kept on a lead at all times

Wildlife

Temporary signage with a visual que indicating nesting season time can be placed relevantly by the area association with input from local school children to generate awareness. Information on QR codes to indicate the following;

• Observe wild animals and birds from a distance. Avoid disturbing them, particularly at sensitive times: mating, nesting and raising young

• Keep wildlife wild, don't feed wild animals or birds

Property

Temporary signs and QR codes to communicate;

Leave What You Find ; Advice also relating to property namely;

Respect property. For example, farming machinery, fences, stone walls etc. Leave gates as you find them (open or closed).

Farming and the Community Fair Day

• Respect Farm Animals and Wildlife

• Farm animals are not pets; remain at a safe distance.

As iterated, in addition to general information to the public, a pilot scheme with signage specifically to be used by landowners adjacent to the trail may need to be considered to bridge the gap and understanding between trail users and farming families. Signs e.g. during lambing season warning trail users to ensure their dogs are secure, or advising of the likely days slurry is being spread.

There is also a need to have a fun information day organised perhaps on the fair green (e.g. Fair Day for Old Kilcullen, June 11, Saint Mactail's Day) where trail users can interact with farmers, see farm animals up close and get information about the role local agriculture plays in biodiversity and archaeological protection or examine the role of local agriculture in history. There may be an

opportunity to double this with the maintenance of the semi natural grassland section identified, where a few days of light cattle grazing e.g. Dexters or yearlings on the after grass every year, would benefit its species diversity. A community haymaking festival supported by local farmers with community involvement in the style of an old fashioned meitheal could be considered to get the whole community and local schools involved in the semi natural grassland management and add an agro historical and family element to the work involved.

QR code information integration

Preserve the past: Advice on the best way to examine the monuments without disturbing them can also be added to QR codes along with archaeological information e.g. examine - without damaging - archaeological structures, the walls, the round tower and the entirety of Old Kilcullen's National Monument. The archaeological report has also advised the QR codes should give a 3D presentation of high cross details and their significance. The same is advised of the landscape and in particular the historical landscape with 3D presentations of how each part of the landscape would have appeared at important junctures in Old Kilcullen's history. The likely appearance of the town walls and town gates at their likely locations would also be included and available at QR code information points. This information would be archaeologically guided. Advice around the archaeological monuments as information is accessed via QR codes can include advice to visitors to not build rock cairns, structures or shelters etc.

Some more archaeology led walks at relevant times of the year with an emphasis on preserving the past would support heritage trail enjoyment and protection. The archaeologist can indicate at each QR point all the information to be gleaned on future visits.

Conserve the present: The ecology information on the QR codes to advise visitors to leave rocks, flowers, plants, animals and all natural habitats as you find them. Fallen wood is not to be removed for firewood. Only branches or timber identified in the management plan to be removed as part of landscape operations. The community therefore need to be involved in the formulation and implementation of the landscape management plan. The QR code information relevant to each aspect of biodiversity to be guided by the relevant expert e.g zoologists, bat specialists, ornithologists, botanists, lepidopterists etc. KCC biodiversity officer to input relevant elements of the current policy. All to have clear imagery which would help those interested easily identify what is around them.

Litter Waste and Fires

QR codes and temporary signage to communicate the following;

Dispose of Waste Properly ; "If You Bring It In, Take It Out" – encouragement to visitors as they access information on QR codes to take home all litter and leftover food. However in the case of most litter generated currently in the vicinity, fly tipping and grass clippings account for what was visible on site visits. The placing of the temporary signs very obviously at known fly tipping sites can discourage littering by indicating that the site is being observed.

Litter Campaign

A campaign involving the litter warden on addressing the issue can be included in the parameters for monitoring and management of the trail.

Fire Community Response Plan and Landscape Management Strategy

Minimise the Effects of Fire ; Fires can cause lasting impacts and be devastating to plants, hedgerows, natural habitats and farmland. Accidental fire damage to gorse seems to be the main item to be avoided possibly from cigarette disposal on the proposed trail. A community wide level of alertness with specific plans included in the monitoring and management phase of the trail development will

have the most effective outcome. The proposals also include planting to reduce the dependence on gorse and allow for it to be cut back from time to time making it less flammable.

8.8 Integrated Trail and Landscape Management

Integrating all the strands below with trail and landscape management is ambitious and will require clear communication and input from the relevant parties and members of the community. However once a plan is in place it can be monitored and upgraded. It will need to be detailed, problems identified and solutions implemented. There is overlap between the elements as outlined below which is why an integrated plan coordinated on a landscape level will be important to optimise the benefits of the trail.

Practical Trail Management Surfaces and Managed Margins etc.

Keeping the trail clear of debris , branches leaf and litter. Mowing and maintaining margins will require an integrated management approach between landscape managers and road managers.

Archaeology

Trail information, curating information for QR codes. Walking trail, school information etc An integrated management approach as to the information and how it is relayed will be required as well as the overall archaeological landscape pattern as we see it today. Practical interactive site maintenance with IT input will be required as well as practical landscape maintenance at QR code sites along the trail.

Archaeological grasslands

Semi natural grasslands

The semi natural grasslands and archaeological grasslands to be managed together in a coordinated fashion. Hedgerows are also to be coordinated with semi natural grassland management at the outset until control of bramble and scrub can be achieved.

Hedgerows

Hedgerows, Radial Pattern and QR information points

Private Garden Hedges

Invasive species

To successfully achieve a radial pattern restoration and to control invasive species in the hedgerows the local authority and the private garden / land owners will need to work to a long term plan to achieve the ambitions as set out. This will require training workshops in laying, managing invasive species and plant propagation as well as the significance of specific lengths of hedgerows in the context of the Old Kilcullen Landscape.

Disease

Plant disease monitoring is going to be more important over the next coming years. As well as ash die back, it is likely rural landscapes will suffer other set backs in the years ahead and this will need to be tackled.

Tree Planting and Maintenance

Young trees will need watering, weeding and nutrients until they establish themselves. The location of infill hedgerow trees and hedgerow needs to be marked and their maintenance included in overall plans to ensure they get a chance to establish.

Wall Restoration and Maintenance

Wall restoration and wall biodiversity will require some coordination. The lime content of walls makes for an interesting flora but restoration will necessarily mean raking out joints etc. There is a balance to be struck on the vegetation to be removed to protect the wall and the flora which can remain eg *Cymbalaria muralis* which is unlikely to harm the wall. At the round tower there is a difficult task in selecting invasive Sedum alba to be removed from the other beneficial Sedum in the wall and this will have to be coordinated at the time of restoration and will be an ongoing management issue for a time thereafter.

Safety, Speed Reduction and Trail Usage

Monitoring of the safety of the trail will need to occur every two years and community surveys will need to feed into the trail management strategy. Continuing to get community buy in to speed reduction will greatly determine the success of the trail.

Community Events and Leave No Trace

Community involvement will be very important in extending the inclusion of all members of the community in particular the farming community at festival like events. This provides an opportunity to include all voices and concerns and disseminate Leave No Trace style information to potential trail users.

Fire and Community Security

The community alert scheme members might also take on the role of fire alert along the trail. A community wide alert coordinated with the local fire station with in advance training as to appropriate response in cases of emergency.

9.0 Conclusions

The main conclusions following public meetings, the review of literature, stake holder and public consultation was that;

Practical Strategy

- The 'Quiet Lanes' strategy was most suited to the Old Kilcullen trail.
- Extending the 'Quiet Lane' to the north to the R448 at the 1798 monument would provide the community with an interesting local amenity closely associated with heritage features, increase passive surveillance and allow local people to comfortably avail of landscape and visual amenity. It would also extend the length of the trail.
- General community support to change driving habits and reduce speed.
- A phased approach to trail development was required to bring along as many members of the public as possible.

Landscape and Biodiversity

- The landscape proposals will greatly benefit the visual amenity of the area as well as having very significant ecological benefits.
- Semi natural grasslands are rare and it is important to restore them. They also constitute an important and special landscape character defining a space that has probably existed since monastic times.
- The spatial layout of the landscape is unique around Old Kilcullen and is worth preserving and protecting in its entirety.
- Hedgerow maintenance and material propagation. This measure can be implemented immediately with support of OKACA and KCC. There is a very enthusiastic cohort of the community who would like to avail of a workshop/ training course (with Irish Hedgerow Association) in order to preserve the hedgerows in their own ownership. This could occur in November or January and February each year with a community wide plan indicating where and the methods used to protect, lay or replant sections of hedge. Local nurseries in the county who specialise in hedgerow materials to be asked to propagate from local plant materials. Plant propagation workshops for local people who would enjoy rejuvenating their hedgerows using their own materials would also be popular and very beneficial.
- Additional measures to include all members of the community and local schools e.g Leave No Trace Information campaign to increase awareness and establish a local etiquette, informing visitors to the area of same.
- Integrating heritage, landscape and biodiversity with the positioning and location of the 'Quiet Lanes' key components was welcomed by the community. The use of smart codes allows users to avail of a wealth of information at key locations.

Benefits

- Generally a cost effective solution to trail development that will have a large benefit to all members of the community.
- Monitoring and landscape management to inform traffic calming and biodiversity improvements and landscape protection will be required post construction to ensure the trail will be a success.
- Large benefits to the wider community in addition to outdoor exercise making it an attractive place to live and work from home.

- A project that encourages exercise in the community that does not require any carbon emissions.
- The use of shared surfaces and unbound compacted stone and dust as a surface along Lorg Lane, makes this a very economical and feasible trail. It also ensures there is adequate budget to achieve all the landscape biodiversity and wall restoration ambitions of the trail . This will ensure it is an attractive place for exercise or an outdoor classroom/museum.

First Example

This scheme if successfully implemented will be the first 'Quiet Road' scheme in Co. Kildare. It will also be the first in rural Ireland making it a very important example. Many areas of County Kildare and indeed all over Ireland have similar strengths and opportunities to avail of 'Quiet Roads'. It is a hugely underutilised resource which could greatly improve the quality of life in rural communities. Trails offer a great way of improving the visual amenity and biodiversity of rural areas. Whilst Old Kilcullen has a particularly rich archaeological heritage, all rural communities have some heritage elements worth highlighting.

As a first example of a 'Quiet Road' scheme it is a great opportunity to showcase the many benefits this trail will have for the local community and its quality of life.

Another first example in the country would be the integrated landscape planning and management approach for sites rich in archaeological heritage. Integrating the site protection with information dissemination, landscape and biodiversity protection and amelioration and trail management will be an important example to other similar sites. The low impact of walking and cycling with site visitation will be a significant factor in visiting all heritage sites in the future.

The proposed scheme as well as being feasible will be a great example of the potential of other similar areas around the county and within the country generally.

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Appendix 1

Stakeholder Consultation Roads Dept. Road Traffic Perspective

Roads Design perspective of Feasibility Study Walking Route at Old Kilcullen

DTTAS Support Office Quiet Lanes and Neighbourhood Greenways- A Brief Summary of UK and US experience.

700MM MAINS KCC Ballymore Eustace

Appendix 2

Public Meeting Sheets

Appendix 3

Engineering Report