

# Old Kilcullen Heritage Trail – Engineering Report



**DOOLEY CUMMINS**  
ARCHITECTS + ENGINEERS

Stanhope St., Athy, Co. Kildare  
Tel - 059 8640013  
Email - [info@dcae.ie](mailto:info@dcae.ie)

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3190 – Part 8

27/11/2023

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*Civil Engineering Report in support of the development of a heritage walking route in Old Kilcullen.*

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## 1 Introduction

### 1.1 Project Description

The Old Kilcullen Area Community Association (OKACA) wish to develop a heritage walking trail in Old Kilcullen. Kildare County Council are supporting OKACA in their endeavor. OKACA and Kildare County Council had identified a number of potential walking routes around and through the Old Kilcullen area.

Hayes Ryan Landscape Architects were invited to investigate the proposed walking routes and prepare a feasibility assessment for the proposed development. Hayes Ryan have instructed Dooley Cummins Architects + Engineers to consider the civil engineering aspects of the proposed scheme.

### 1.2 Rural Nature of Old Kilcullen

This Old Kilcullen area is rich in natural and archaeological heritage. The area is adjacent to the hill of Dun Ailinne, which is a candidate UNSECO World Heritage Site. The project area contains two National Monuments being the Old Kilcullen Round Tower and a barrow north of the Round Tower.

The area contains a public house, a crane hire business, a quarry / soil and subsoil waste facility and low density residential properties consisting of detached bungalows. The land is generally in agricultural use with some commonage land to the north of the study area.

The road network in the area consists of narrow local roads with typical widths of 4.0m. The edges of the carriageway consist of grass margins. These margins are well maintained adjacent to residential properties but have grown wild in most other areas. The roads are bounded by mature hedgerows in various conditions along the routes. Traffic generated in the area can be considered to be local traffic. There are no significant trip attractors in the immediate area.

### 1.3 Development Phasing

During the course of the study it became apparent that consensus did not exist for the scheme to be developed as originally proposed by OKACA and Kildare County Council. Portions of the route were found to be unsafe as they involve vulnerable road users having to cross major roads where pedestrian crossing facilities were not provide or considered appropriate. Additional portions of proposed routes were in private ownership where consent for the development of the lands has not been obtained to date.

It became clear during the initial feasibility assessment that phasing of the project would be appropriate.

- **Phase One** Halverstown Cross Roads to 1798 Monument
- **Phase Two** Halverstown Cross Roads to Hacklow Cross Roads
- **Phase Three** Brennan's Pub to Hacklow Cross Roads via the Telecommunications mast.

The initial phase would be likely to meet the project requirements for a walking route with improved safety measures. A second phase would involve more infrastructural work but would link additional areas. A final phase does not have consent and is seen at this stage as aspirational only. This final phase would link up the first two phases.

This report primarily addresses measures to be taken to support phase one of the project.

## 2 Site Appraisal

### 2.1 Site Description

The site consists of a network of local roads generally with a restricted width of circa 4m. The roads contain grass margins on both sides of varying width. The roads are bounded by mature hedgerows in various condition.

The land use is primarily agricultural with low density residential development comprising detached bungalow.

Commercial development is limited to a rural public house, a quarry/waste facility and a crane hire compound.

### 2.2 Existing Traffic Volumes and Design Speed

A traffic count and traffic speed assessment was carried out on Friday, 5 May 2023 between 8am and 10am. The weather was dry, warm and bright.

Time	Cars		LGV		HGV		Agri		Ped		Cyclss		Moto rcycle s	
	N	S	N	S	N	S	N	S	N	S	N	S	N	S
8:00-8:15	2	2	1	0	0	0	0	0	0	1	0	0	0	0
8:15-8:30	6	0	1	0	0	0	0	0	1	0	0	0	0	0
8:30-8:45	7	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45-9:00	7	6	0	0	0	0	0	0	0	0	0	0	0	0
9:00-9:15	4	6	0	0	0	0	0	0	1	0	0	0	0	0
9:15-9:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0
9:30-9:45	1	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45-10:00	5	4	0	1	0	0	0	0	0	0	0	0	0	0
<b>Total Link</b>	34	20	2	1	0	0	0	0	2	1	0	0	0	0
<b>Total Modes</b>	Cars		LGV		HGV		Agricu ltural		Pedes trians		Cycles		Motor cycles	
	54		3		0		0		3		0		0	

Fig 1 – Traffic Count Data

The traffic count was taken at chainage 1350, identified on drawing 3190/01/02.

The count separated the modes of transport and their direction of travel in 15 minute intervals. The two hour count suggests low traffic volumes on the existing local road network in the area. The majority of vehicles were observed between the 8:30 to 9:00 period suggesting people leaving for work and school runs. There was no commercial traffic, with LGV's taken to be commuters travelling to work. The daily traffic flow on the local road network is expected to be less than 300.

### 2.3 Design Speed

The traffic survey also estimated vehicle speeds between 8am and 10am. A total of 34 speed observations were taken. These observations were taken in both directions but the majority of recordings were travelling towards the north on a decline towards the observation point. The observation points were 150m apart.

Time	Speed	Time	Speed	Time	Speed
(s)	(km/hr)	(s)	(km/hr)	(s)	(km/hr)
8.8	62	10.7	51	9.4	58
10.0	54	9.0	60	9.1	59
11.7	46	9.5	57	7.2	75
11.0	49	11.0	49	9.7	56
9.0	60	7.5	72	7.4	73
7.0	77	9.1	60	6.4	85
9.0	60	6.8	80	9.9	54
7.0	77	9.6	56	10.7	50
7.2	75	9.0	60	22.6	24
9.9	55	10.2	53	11.4	47
6.8	79	7.6	71	9.2	59
7.3	74				

Fig 2 – Vehicle Speed Trials

<b>Design Speed</b>	<b>75.2</b>	<b>km/hr</b>
<b>Maximum Speed</b>	84.6	km/hr
<b>Average Speed</b>	61.1	km/hr
<b>Minimum Speed</b>	23.9	km/hr

Fig 3 – Design Speed.

The design speed can be taken to be 75kph.

## 3 Management of Road Users

### 3.1 Road Users

The local road network primarily serves the local population with limited passing traffic. The local network does not provide alternative routes to trip attractors and does not provide the function of a 'rat run'. Transport modes are expected to be varied and consist of pedestrians, cyclists, motorcycles, private cars, LGV and agricultural vehicles. The predominant current transport mode is the private car.

#### 3.1.1 Vulnerable Road Users

A primary aim of the project is to improve the safety of vulnerable road users (VRU's) such as pedestrians and cyclists and to encourage physical activity for mental and physical health.

The existing road network is currently in regular use by walkers for recreational purposes. All walkers use the road as a shared surface. The main walking route is from Halverstown Cross to the 1798 monument but all local routes in the area are in use. The principal users are local residents who are aware of the road geometry and expected traffic types and volumes.

#### 3.1.2 Local Vehicular Traffic

Existing vehicular traffic on the local road network consists primarily of private motor cars. The principal trips are to and from work/school. Traffic volumes are low with approximately 300 movements per day for all modes.

#### 3.1.3 Agricultural Traffic

The Old Kilcullen area is predominantly an agricultural area with a mixture of live stock and tillage farming taking place. Agricultural traffic is expected on the road network in the form of large tractors and associated long trailers. Volumes of agricultural movements is expected to be generally very low other than during seasonal operations such as ploughing, planting, fertilizing, spraying and harvesting. The road surface may become soiled during these periods.

#### 3.1.4 Commercial Traffic

Commercial traffic volumes are expected to be very low on the local road network. The main commercial activities consist of the Kilsaran Quarry and Waste Facility accessed from the R448 at Halverstown and Casey Group Crane Hire yard at Hacklow Cross. Neither commercial enterprise use the local road network for access.

### 3.2 Management Techniques

A variety of methods were considered to improve VRU safety on the walking routes. A number of techniques are consider suitable only for urban use where traffic volumes are higher, VRU numbers are larger and the road

network is wider and contains footpaths and traffic control measures such as defined crossings and traffic lights.

Methods for use in rural areas are more limited. Consideration of the economy of traffic calming and VRU safety measures also plays a part in the decision making process. For this reason novel methods have been considered which are intended to positively change road user behaviour.

### 3.2.1 Rural Nature of Old Kilcullen

The Old Kilcullen area is primarily an agricultural area with low density detached single storey dwellings. The area is rich in nationally important archaeological heritage. The area is immediately adjacent to Dun Ailinne hill which is a UNESCO candidate World Heritage Site. The area is also rich in natural heritage in the form of mature hedgerows which are an important habitat for indigenous flora and fauna.

### 3.2.2 Urban Traffic Calming Methods

The use of urban traffic calming measures and provision of VRU facilities such as hard footpaths and road crossings, traffic light controls and heavy reliance on “Signing and Lining” is therefore not considered appropriate.

### 3.2.3 Horizontal and Vertical Deflections

The use of horizontal and vertical deflections to slow traffic is widely used in urban and suburban locations.

Vertical deflections included, ramps, speed cushions and speed tables. The use of vertical deflections is advised against by emergency services. Vertical deflections also promote vehicles travelling outside the travel lane to avoid or partially avoid the speed control measure. Vertical deflections are incongruous with the rural setting of Old Kilcullen.

Horizontal measures include build outs and chicanes. These measures have the effect of changing the horizontal alignment of the road forcing traffic to slow on approach. VRU's however are also forced out by the alignment change unless separate travel lanes are provided clear of the horizontal measures.

The existing road is approximately 4m in width with verges of limited width on both sides between mature hedgerows. There is limited scope to provide chicanes or build outs and also provide for pedestrian and cyclists along the route. Horizontal deflections are also incongruous with the rural setting of Old Kilcullen.

### 3.2.4 Passive Traffic Calming Measures

Various passive techniques to positively influence the behaviour of road users were considered which respect the rural setting of Old Kilcullen and do not negatively impact on its natural and archaeological heritage. These techniques are considered appropriate and economically sensible considering the length of the routes, the low

traffic volumes and low likely VRU's who will use the scheme. These passive methods are easy to implement, monitor and amend.

## 4 Traffic Calming Proposals

### 4.1 Quiet Lanes

The quiet lanes scheme was developed in Suffolk to improve the quality of the road network for the enjoyment of recreational activities such as walking and cycling. The organisation's website [www.quietlanessuffolk.co.uk](http://www.quietlanessuffolk.co.uk) describes the Quiet Lane ethos as:

*"They are routes where visitors and locals can enjoy the natural surroundings and use them for activities such as cycling, horse-riding, jogging and walking. However, the idea is not to restrict motor vehicles on these rural routes, but to encourage considerate use of the road, so they can be shared and enjoyed by all.*

*An official Quiet Lane will have advisory signs at either end to show motorised users clearly that the road is a shared space. These green signs also clearly show the hierarchy of priority on the road, with pedestrians at the front and motor vehicles last."*

There are currently 350 Quiet Lanes in Suffolk County.

This scheme is considered to be a very good fit for the Old Kilcullen area as it is relatively easy and cost effective to implement, monitor and adjust. The aim of the scheme is to positively influence the behavior of all road users and create as a safer shared space for all.

### 4.2 Gateway Zones

The Phase One portion of the scheme is located between Halverstown Cross Roads to the south and the 1798 Monument to the north of the L6080 local road. 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 VRU's are also using the carriageway ahead.

Transport Infrastructure Ireland (TII) have recommendations for Gateway designs for *Rural Urban Transition Zones*. It is proposed to modify detail CC SSD 05101 for use in this scheme. The TII detail uses an alternative surface at the gateway for the full carriageway width for a length of 10m. It is proposed to use buff coloured resin bound Calcined Bauxite in this scheme. This provides a high friction surface at the junctions with the R448 and signals the entry to the Quiet Lane zone.



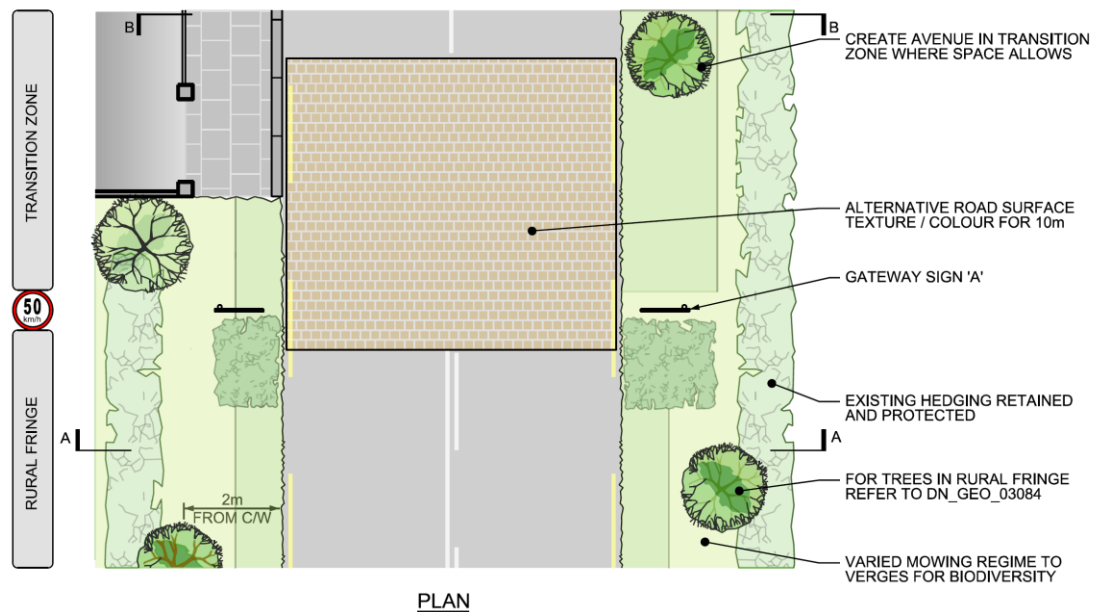


Fig. 4 – Extract from TII CC SCD 05101

### 4.3 Speed Control Measures Appropriate to the Rural Area

Opportunities for speed control in this rural area are limited. The use of “False Cattle Grid” road markings is considered to be an effective way to slow traffic without negative impact on residential amenity, natural or archaeological heritage.

The control measure uses closely spaced bands to give the perception of a cattle grid to slow down road users. This measure is used throughout the scheme and is repeated at 70m centres at the gateway zones and at informal crossing locations. The intention is to continually reinforce the “Share Space” / “Quiet Lane” zone.



Fig. 5 – False Cattle Grid.

## 4.4 Signage

### 4.4.1 Quiet Lanes / Share Space Sentinel Signage

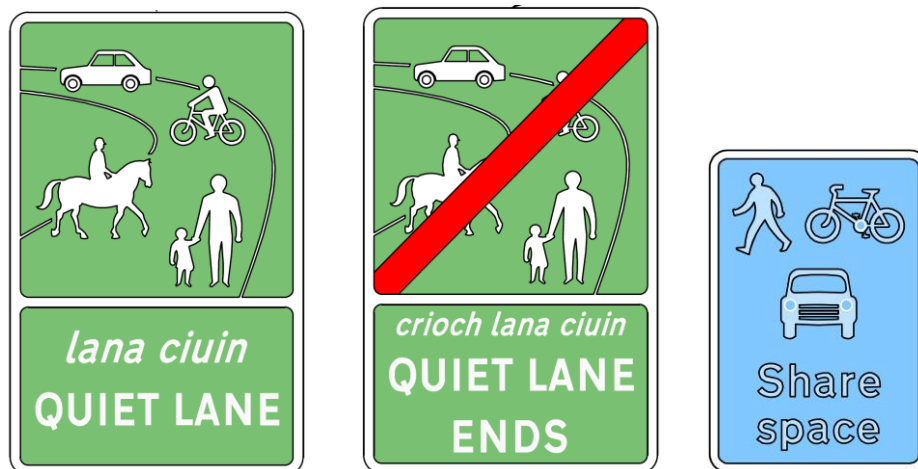


Fig 6. – Gateway Zone Quiet Zone Sentinel Signs

The gateway entry zones shall be provided with sentinel type signage including Quiet Lane, Share Space and Quiet Lane Ends. Signage shall be located to ensure that pedestrian/VRU use of the managed margins is not impeded and that intervisibility is not restricted. No signage shall be within 0.6m of the carriageway surface. Where signage is immediately adjacent the carriageway edge the bottom of any sign shall not be lower than 2.4m above the road surface. Signage can be mounted on oak or steel railings where a step in space of 1.8m is available between the sign and the carriageway edge.

### 4.4.2 Heritage Signs – Signboard at Round Tower

Other finger type signage may be used along the route. Such signage shall be located to ensure that pedestrian/VRU use of the managed margins is not impeded and that intervisibility is not restricted. No signage shall be within 0.6m of the carriageway surface. Where signage is adjacent the carriageway edge the bottom of any sign shall not be lower than 2.4m above the road surface.

A scheme signboard is to be provided adjacent the Old Kilcullen Round Tower site. This signboard is located well away from the carriageway and pedestrian routes.

### 4.4.3 QR Codes Avoidance of Visual Clutter

The scheme will use QR codes on timber bollards to avoid visual clutter along the route while providing access to useful information on the Natural and Archaeological Heritage of the area. Such signage/information points shall be located where adequate space is available for VRU's to step in away from the carriageway to use the QR code station and read any associated information on their phone. Such QR code stations will be located in sensible safe locations once their content has been developed.

## 4.5 Road Markings

Road markings shall be used to provide passive traffic calming and also to separate road users where appropriate.

### 4.5.1 Verge Lines

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.

It is also proposed to provide a new hedge along side this car parking area to control the entry and exit points to the car parking area which is currently unbounded. Access to the car parking will otherwise be unaffected by the proposal.

## 5 Pedestrian Provisions

### 5.1 Managed Margins

The primary method of improving VRU safety along the walking heritage 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.

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.

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.

### 5.2 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 drawings which accompany this report show intervisibility triangles from these crossing points. The crossing points are uncontrolled and unmarked. The crossing points shall be signaled by the condition of the margins on both sides and shall be obvious to road users. 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.

### 5.3 Sight Intervisibility

The traffic survey carried out identified the design speed (85<sup>th</sup> percentile vehicle speed) as 75 kph. The appropriate stopping sight distance is 90m at a set back of 2.0m.

## 6 Parking Provisions

### 6.1 Car Parking (Details)

It is proposed to provide 11 car parking spaces at the northern end of the walking route. The 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 Geosynthetic Grass Reinforcing Grids on a sub base layer on a geotextile membrane. The car parking area will require on going maintenance consisting of grass cutting.



Fig 7 - "Geogrid" Geosynthetic Grass Reinforcing Grid (prior to Grass growth).

An informal car parking area is located adjacent to the Old Kilcullen Round Tower. It is not proposed to include this area as a car park serving the walking route as it is located close to an existing junction and sight visibility is restricted at this location.

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

timber bollards at 3m centres. The bollards shall be fitted with reflectorized strips. The bollards shall be removable where access is required.

## 6.2 Bicycle Parking Provisions (Details)

3no. Bicycle parking racks (6 bicycles) shall be provided on a bitumen macadam surface with coloured resin surface to differentiate the parking area with the surrounding area. The cycle rack shall be simple tubular stainless steel racks set in concrete foundations. The parking bay shall be laid out so that the bicycles are parked parallel with the carriageway line of travel.



Fig 8 - Stainless Steel Bicycle Racking.

## 7 Future Phases

### 7.1 Phase Two

Phase Two of the project is located between Halverstown Cross and Hacklow Cross. This phase envisages the development of a VRU track for approximately 530m and for local road improvements on the L6083 for a length of approximately 840m.

#### 7.1.1 VRU Track

The proposed VRU track shall facility walkers, cyclists and equestrian users. The track shall be surfaced with unbound quarry dust and shall be designed to comply with TII DN-GEO-03047 which states:

*“Although a closed pavement construction is preferred by cyclists in terms of comfort and safety, there are occasions where a surface is required to give a sense of the environment.*

*In rural cycleway and greenway situations, where the cycleways attractiveness is just as important as comfort, dust path construction or other loose material*



*construction maybe the preferred option in order to blend with the environment and to avoid unnecessary impacts in forests, along protected heritage trails, tow paths and along river banks. The application of loose surfaces can enhance the cycleways' appeal to its users due to its more natural aesthetics."*

Over-the-edge drainage is the preferred arrangement for a rural road with a cycleway adjoining and is the method used for the VRU track.

Where over-the-edge drainage is used it is important to ensure that the surface water runoff flows off the cycleway towards the drainage ditch and does not pond. Suitable crossfall of between 1% and 3% shall be provided on the trail way pavement. The verge either side of the route shall be constructed with a crossfall of no more than 10%. The outside pavement edge detail of both the trail route should be higher than the proposed ground level by the depth of the pavement wearing course to stop back flow of the surface water runoff from a flat grassed verge.

### 7.1.2 Local Road

The balance of the Phase Two route will require repair of potholes and surface dressing.

The existing route is a cul-de-sac and provides local residential access and agricultural access only. There are no opportunities for vehicle turning on the roadway at the end. Signage will be required to identify the road as a cul-de-sac without turning opportunities.

Managed Margins shall be provided along the Local Road element of the Phase Two trail where possible.

### 7.1.3 Signage

Gateway zone signage and traffic calming measures such as false cattle grids will be provided along the L6083 as appropriate and shall generally mirror the provisions along the Phase One element of the project.

## 7.2 Phase Three

Phase Three of the project is in private ownership where consent for the development of the lands has not been obtained to date and is seen at this stage as aspirational only. This final phase would link up the first two phases. Phase Three is not considered further at this time and may be visited in the future when the successful implementation of Phase One and Two can be assessed.

## 8 Conclusion

The development of a "Quiet Lane" at Old Kilcullen by the Old Kilcullen Area Community Association supported by Kildare County Council is an important pilot project to create a safe active recreational local road network which promotes the enjoyment of the area's natural and archaeological heritage and allows for active healthy enjoyment of Old Kilcullen.

The Quiet Lane project started in Suffolk County in England and has grown to include 350 quiet lanes at present. The scheme aims to allow the sharing of the rural space

with restrictive legislative controls or inappropriate traffic calming measures in a rural area. The scheme attempts to change the mindset of the road users to ensure that vulnerable road users can use the road network actively in a safe manner.

The proposed scheme is phased to ensure a project that can be delivered economically without negative impact on residential amenity or the rich natural and archaeological heritage of the Old Kilcullen Area. The measures are passive and can be modified easily following a period of use and monitoring. The success or otherwise of Phase One will inform the further development of Phase Two and Three.

The scheme has the potential to be expanded into other parts of rural Kildare and become a recognizable shared space that motorists will understand.

A handwritten signature in black ink, appearing to read 'Cormac Dooley', written over a horizontal line.

Cormac Dooley, BE MSc MIEI  
Dooley Cummins Architects + Engineers