

# Trial of Preventative Winter Salting Treatment for Key Cycleways Around Exeter

## Findings Report and Confirmation of Continuation in Winter '22/23

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### Version History:

Version	Date	Sign-off	Summary of Changes
1.1	July 2022		Initial document
1.2	August 2022		Minor changes to cost estimates etc, following Alex's review

## 1.0 Executive Summary

This report presents the findings following a trial of preventative winter treatment on the most well used cycleways in Exeter and should be read in conjunction with the associated business case submitted in February 2022.

The trial was initiated following endorsement by the Corporate Infrastructure & Regulatory Services Scrutiny Committee in March 2019 based on various recommendations from the Highway Winter Service Task Group, namely:

### *Recommendation 1.3*

*The County Council to continue to monitor cycle path journeys in Exeter and other key cycling routes, and reconsider winter treatment if/when journey numbers significantly increase (i.e. when winter cycling path journeys are around 1000 per day, in line with the criteria used for roads).*

The project team worked alongside colleagues in the Planning, Transportation and Environment directorate (now jointly Climate Change, Environment and Transport) to determine routes around Exeter which are now regularly exceeding the above count, in order to establish a trial route.

A number of options in relation to treatment vehicles, methods and materials were considered and a significant amount of stakeholder engagement took place, with a trial formalised and successfully undertaken in April/May 2022.

**Following completion of the initial trial, and recognising the current budgetary pressures, it is the recommendation of the project team that a second trial is undertaken for the whole of the 2022/23 winter service period. This has subsequently been agreed by:**

- **Meg Booth – Director of Climate Change, Environment & Transportation**
- **Cllr Stuart Hughes – Cabinet Member for Highway Management**

**This report will provide further details on the lessons learned and subsequent continuation of this trial**

## 2.0 Further Endorsements

The following quotes represent some of the key endorsements received regarding the trial:

Councillor Stuart Hughes (Cabinet Member for Highway Management):

*“We are committed to promoting active travel as it will improve people’s health and reduce carbon emissions, but we also recognise that when the temperature drops routes can become slippery and of concern to cyclists. We were pleased with the success of last year’s short trial to treat the busiest cycle paths in Devon and this was reflected in positive feedback on social media. The cycle count data also showed positive trends after treatments. This is a great example of our Traffic Group contributing to DCC’s Strategic Plan and I’m therefore delighted to support an extended trial this winter.”*

Mike Walton, Chair of Exeter Cycling Campaign:

*“If we’re to reach our goals of decarbonising the city’s transport and enabling half of Exeter’s journeys to be by foot or bike we must make it safe to travel like this....all year round. De-icing cycle paths plays an important role in ensuring our cycle paths are seen to be safe and can be used by everyone for their everyday journeys. The Exeter Cycling Campaign is very supportive of moves to trial cycle path de-icing in the winter and will continue to ask that this becomes part of the normal road safety measures the county takes each winter.”*

Mike Walton also kindly agreed to put together a brief [questionnaire](#) to be shared with Exeter Cycling Campaign members to collect their thoughts on the trial. In total 127 responses were received, with very positive results showing that:

- **62% were aware of the treatment trial last winter**
- **87% of people would be more inclined to cycle if they knew cycle paths were being treated**
- **over 95% of people support the treatment trial being extended**
- **nearly 84% support the routes that you've started to treat**

Daryl Taylor-Hopgood, Project Engineer, Net Zero Exeter and City Management, Exeter City Council:

*"I've spoken to canal and parks managers and I can confirm that we are all supportive of you continuing your trial as per your map. As you say, this will hopefully provide some useful data which might support modification or expansion of the route but at this point I cannot think of any changes needed to the plan."*

### 3.0 Trial & Proof of Concept

Whilst the physical trial involving the hire and use of the chosen vehicle was undertaken during April/May 2022, background research commenced several months prior around determining a suitable route that would incorporate cycle paths where known frequency was sufficiently high. The process of deciding upon a route was generally data led, however it was important to ensure good connectivity and onward journeys where possible, ensuring that treated paths formed continuity with routinely treated carriageways.

A significant amount of communication with other external stakeholders was required when formalising the route, including Exeter City Council, Environment Agency and National Highways, all of whom had a vested interest. Internally there was also a need to liaise with Neighbourhood and PROW officers and colleagues responsible for Bridges and Structures. Should the trial be formally adopted as policy and potentially rolled out to other parts of the county, it should be noted that engagement with others must happen as early as possible, particularly where selected routes interact with bridge and structures and/or run in close proximity to watercourses.

The goal around trialling the equipment itself was to establish whether or not it would be able to pass completely around the selected route without difficulty from obstruction, and also to learn more about range capabilities, both from a treatment standpoint but also fuel, along with associated treatment costs. Also, importantly, to inform safe working practices and impacts with regards to potential interaction with other path users. This was achieved successfully.

### 4.0 Equipment Choice & Route

Due to availability, a slightly older vehicle model, a City Ranger 2260 (Appendix 1), was selected for hire over what had previously been discussed with the supplier, which was the Powerflex 3330. Given the similarity in weight, dimensions and manoeuvrability it was felt this would be sufficient in proving the concept and in being able to highlight any potential accessibility concerns.

During the hire period a number of trial runs of the selected route were successfully undertaken, both dry and depositing material, which enabled a good understanding of the vehicle's capabilities. Milestone reported that the driver had noted no significant access problems and was able to complete the route without impediment. Where sections on the route were narrow, for example passing through staggered fencing, it was reported that the articulated steering assisted with passage. It was also noted that there were no concerns around interaction with other users of the paths.

Following extensive conversations with colleagues in our structures department, and also with those responsible for bridges elsewhere on the route, the selected vehicle was able to safely and successfully pass over all but one of the bridges (Appendix 2). Where passage was not permitted, across the new footbridge over Summer Lane (due to the bridge being designed for pedestrian loading only), the vehicle was able to pass via Exeter Arena, without problem, and re-join the route on the other side.

It was also possible, during the trial, to test for accessibility (dry run only) on a section of the Exe Estuary Trail (Appendix 3), from Countess Wear Bridge to Church Road, Powderham, approximately a 15-mile round trip from Heron Road Depot. Again the vehicle operative reported completion of a successful journey with no obstructions or access difficulties.

## **5.0 Route Mapping**

In order to communicate to Milestone the exact route required for treatment, the project team utilised a free to use web-based platform 'Ride with GPS' for mapping, which allowed for route plots to 'snap' to nationally recognised cycleways. This enabled the relevant file to be exported for view in Google Maps which in turn allowed the operative to safely view and follow on their mobile device from the vehicle cabin. Feedback was that this worked well and provided a sufficient amount of detail.

Should the trial be formally adopted some work would possibly be required around aligning mapping with that used in our Winter Service Policy appendices, which set out routes for our carriageway treatments, incorporating both a map and written description for each. However, there is potential to deviate from this and this may in fact be influenced by a wider review of how this information is presented and communicated more generally for the larger gritting operations.

Since the trial period it has been noted that no further locations around the city, outside of those selected, have consistently met the requisite 1000+ cycle movements. The current route therefore remains appropriate for the purpose of continuing the trial in the '22/23 winter period. However, the Project Team are continuing to work with the Exeter Cycling Campaign to ensure this remains relevant.

## **6.0 Material Choice**

As set out in the business case report, the trial made use of a Direct Liquid Application (DLA) de-icer in order to treat the selected route. Two separate proprietary DLA's were procured through a company called Brine Solutions, both of which belonging to the 'Eco Thaw' branding. Eco-Thaw 'Premium' was utilised for the bulk of the treatment and Eco-Thaw 'Structures' used on bridge decks and approaches, where there were concerns from stakeholders around interaction with steel components and potential for corrosion over time. The latter was to be sprayed by hand using a backpack and sprayer in order to maximise control and minimise any overspill.

Two 1000 litre Intermediate Bulk Containers containing the Eco-Thaw Premium product were purchased and stored at Heron Road Depot. The Eco-Thaw Structures product was purchased in small containers. Application of the Premium product across the route was successfully undertaken, however a return to depot was required midway in order to re-fill the storage tank. To remedy this, a larger tank would be required along with a finer level of control over the discharge rates – both of which are available solutions in other plant products, for example the Saltnex Spraying system. This was a key operational lesson from the initial trial.

The hand application of Eco-Thaw 'Structures' on bridges that fell on the proposed route was successfully incorporated in to trial, making use of a separate, dedicated operative and vehicle to carry out the treatments. All bridges on the route were able to be accessed without problems and treatment applied carefully by hand. Through discussion with the vehicle provider it was suggested

that, should the trial process be formally adopted, there is potential to make an adaptation to a larger brine tank to incorporate the secondary DLA, intended for treatment of bridges, in a second compartment. This could potentially remove the need for a separate visit and would enable treatment across the entire route to be delivered by one operative.

The trial and associated background research illustrated that the application of DLA's over conventional brine carries a number of benefits:

- Spray rates can be significantly reduced due to the makeup of the solution, when compared to brine. This enables much better treatment and ultimately should reduce, or remove completely, the requirement to replenish the tank, thus representing increased efficiency.
- The chemical composition of the DLAs utilised on the trial is such that there is a greater level of flexibility regarding treatment times versus conventional carriageway gritting, which is heavily influenced by factors such as rainfall and longevity of application. Increased flexibility in timing would potentially allow for treatments to take place away from key commuter hours, when cycleways are likely to be their busiest. It should also enable the contractor to undertake treatment during the daytime, removing the risks associated with treatment in the dark.
- Both solutions used on the trial carry a reduced environmental risk when considered against a conventional brine solution. This was seen as important given the proximity to water courses and also vegetation throughout the course of the route.
- The DLA's used for the trial were readily available and easily obtained, with delivery possible in as little as one working day. Should the process be formally adopted and rolled out on a larger-scale the project team were also assured that availability would remain the same if the required quantities were significantly increased, along with the requirement for regular deliveries. One possible future option may be to explore the installation of a permanent storage tank at a depot, in similar fashion to our saturators, which would enable pumped deliveries and remove the requirement for IBC's.
- Comparative costs, when considered against brine, it was found that Eco-Thaw Premium, as the prime application for the majority of the route, would work out to be more cost effective, given the reduced spread rates required but also when considering the aforementioned benefits it brings.

The only negative comment received in relation to the DLA product(s) used, anecdotally, was in relation to the smell/odour present, shortly after the treatment had been applied.

## **7.0 Procurement Considerations**

Were it not for the current financial pressures, the project team would likely be recommending DCC purchase the equipment to continue this trial. A key consideration when considering the possible purchase of a machine would be around the ability to keep it occupied through the course of the entire year, and not just during the winter period. Whilst the project team were unfortunately not able to trial some of the additional available attachments during the previous trial, for example the flail, there was a good amount of interest generated, particularly from the local Neighbourhood Team, to suggest there would be several different strands of work where the machine could be utilised, for example siding, cleaning, vegetation and weed clearance. DCC generally also experience annual difficulties in accessing some narrower locations where there is a requirement for vegetation to be cut back, from a safety standpoint, that often require work to be undertaken by hand. Being able to achieve this mechanically, using a vehicle and attachment, would represent significant efficiency benefits.

Following approval of the trial for the '22/23 winter period, the plant has again been hired rather than purchased.

## 8.0 Budget

A provisional amount of £30,000 was set aside to fund last winter's trial, made available from the winter service budget. The following details the cost breakdown on completion and is based on three treatment runs made by Milestone:

Order	Details	Final Costs
Hire of plant – Euromec	4 week hire of Egholm City Ranger 2260 complete with brine sprayer and and sweeper Delivery Collection	REDACTED
Operational costs – Milestone	Costs associated with labour, operating vehicle, fuel costs and any other fees, charges and consumables	* REDACTED
Materials – Brine Solutions	Eco-Thaw Premium (provided in two 1000l IBCs) Eco-Thaw Structures (provided 10 x 20l containers) Backpack and handheld sprayer with 3 set type nozzles IBC hose fill attachment Delivery	REDACTED
<b>Total Trial Costs:</b>		<b>£4,747.74</b>

\*Milestone reported that completing the full treatment, including re-fuelling and replenishing Eco-Thaw took between 3 and 4 hours for the City Ranger driver. In addition, it took approximately 2 hours for the bridges to be treated by a second operative and vehicle. These costs exclude DCC Officer time.

As such, it is felt that the trial delivered significant value and was notably under budget (partly due to the mild period in which it was delivered). Moving forwards, the likely costs for the upcoming winter period are estimated as follows:

Fixed Costs

**RATES REDACTED**

Cost Per Treatment:

**RATES REDACTED**

**Total cost per treatment approx. £689.70**

Assuming 39 treatments in the winter period (based on average outings of gritting route AVO3B over last 5 seasons), it is felt that the further trial for the full 2022/23 winter period can be delivered for £50,000. This will be funded from the winter service budget.

A further consideration would be the installation of remote ice-detection sensors along the route. These would cost circa £5k each and would be funded from the Weather Station Upgrade budget

## 9.0 Lessons Learned & Ongoing Monitoring

The following refers to section 10.0 of the Business Case Report, with updates provided in [green](#), now that the trial has been completed.



- Monitoring of cycle counts and comparing to previous years to help determine if the intervention results in increased uptake. Forecasts having an impact on numbers.
  - Given the trial period was relatively short and at the end of winter season it is unlikely an accurate representation in any changes to cycle movements would be identified. Appendix 5 does, however, set out the movements at all cycle counter locations on the route on the Friday morning after the first treatment and compares against the previous Fridays for the month of March 2022, showing an increase against the average for all sites but one. It is hoped that a season-long trial, coupled with increased public awareness should demonstrate increased cycle usage when compared to previous years, however there will be a number of variables at play such as average temperatures, other weather conditions etc which will need to be factored in.
- Customer contact / satisfaction surveys – social media and general feedback via members and other interest groups (Exeter Cycling Campaign for example).
  - See section 9.0.
- Monitoring numbers of winter related insurance claims (although numbers are already generally low).
  - As with cycle counts, it is likely a longer time period is required to determine effect on insurance claims, however the number of winter-related claims are generally very low, so the value of this measure will need considering. That said, the project team have not been made aware of any related claims for the trial period.
- Routine monitoring and sampling of water quality in the canal. Specifically noting any increase in sodium chloride.
  - Despite best efforts through discussion with local EA officers sampling for water quality was not undertaken during this trial, however given the short scale and small number of treatments undertaken, any impact would have been negligible and likely not even attributable to the trial itself. Again, a winter-long trial with multiple treatments would lend much better to a system of sampling and validation.
- Working with DTN and Vaisala, DCC's forecasters and weather bureau provider, to consider possible deployment of mobile or new static ice detection/weather station equipment to further explore and understand ground conditions on the cycle network.
  - See section 10.0.
- Suitability of the proposed equipment (manoeuvrability, range etc.) and using daytime 'dry runs' when it's not being utilised to explore future route options. This could include 'pop-up' style pedestrian/cycle routes around the city which were introduced as a result of the COVID pandemic).
  - A second route was successfully trialled as a dry run. See also recommendations for next steps in section 10.0.
- Monitoring of expenditure to enable improved forecasting of any future policy changes.
  - The initial trial has been a success in terms of understanding some capital outlay costs, however a season-long trial would help inform costs longer-term. Also, there is room for efficiency savings, such as with a permanent DLA storage arrangement and combined DLA tank/sprayer, which a longer trial would enable us to learn more about.

Regarding the cost of treatment, we would expect a significant reduction in costs once a more sophisticated spraying bar is used to reduce the output of material. Also, if a combined DLA tank can be manufactured, this would potentially remove the cost element associated with a second operative and vehicle completely.

## 10.0 Public Response

A news story was published to DCC's news pages on 31<sup>st</sup> March, which can be viewed [here](#). The story was also shared across DCC's social media platforms including the wider corporate Facebook and Twitter pages and was also tweeted via the Devon Alert Twitter. Similarly, Exeter City Council

shared the news across their social media platforms. The Exeter Cycling Campaign group also shared the news on their Twitter and Facebook pages, receiving several positive comments, some of which can be seen in Appendix 6, along with a combined total of over 50 'likes' and 6 'retweets'.

Comments across all platforms were generally very positive and supportive of the trial, many of which making reference to the trial/treatment being overdue. Only one or two negative comments were noted, one of which referring to the need to be filling potholes instead.

Anecdotally there was support from several other parties also including members. Stuart Hughes, cabinet member for Highways, expressed his delight on several occasions that the trial was taking place, and actively promoted the trial via social media on several occasions.

At the time of writing, the Project Team continue to engage with these stakeholders to ensure that the upcoming '22/23 winter trial is an equally positive news story for DCC

## 11.0 Summary and Recommendations

Following successful completion of the '21/22 winter trial, and in accordance with the recommendation of the Project Team, it has been agreed that the trial will continue this coming winter (22/23) with a view to possible further expansion into other areas of the County in the longer term.

Whilst the trial was a success insofar as proving the concept and capabilities in undertaking treatments, it did highlight that a significant amount of planning and communication with stakeholders was required in order to ensure all important aspects were being considered from operational, commercial, safety and environmental standpoints. It is hoped that, on this basis, the output of the trial will have forged a 'blueprint' of what is required going forward. This blueprint will be refined in the coming winter

It remains the firm opinion of the Project Team and those that support it that that the delivery of cycleway treatments demonstrates a real opportunity to contribute to DCC's wider strategic objectives for 2021-2025, most notably around helping communities to be better connected and healthier through promoting increased activity. Furthermore these treatments will directly aid the Authority's environmental commitments around net-zero carbon emissions.

To achieve the continued trial in winter '22/23, the following 'next steps' are required:

- **Procure hire of equipment to enable continuation of trial for a full winter season, to involve internal procurement team and also Milestone.**
- **Procure DLA's**
- **Costing/procurement exercise for potential installation of permanent DLA storage tank at Heron Road depot**
- **Further discussions with Euromec/other suppliers around plant and possibility of adapting tank/sprayer so that single operative can treat entire routes, including bridges.**
- **Further research around DLAs to see what else is available on the market to ensure best value vs requirements.**
- **Further discussion with Vaisala/DTN around installation of fixed monitoring sensors on route to enable specific forecasting and validation of treatment actions.**
- **Exploration of potential other routes in other towns/areas around the County and how the trial may be expanded – including involvement of other officers. Potential to link with COVID routes in Exeter and also existing gritting routes to enable forward journeys e.g. to Marsh Barton Station.**
- **Look at improved means of communication to inform when/where we are treating, so path users can plan their journeys accordingly in advance (e.g. via @DevonAlert).**



# **APPENDICES**

## APPENDIX 1: City Ranger 2260 used for trial



Eholim City Ranger 2260 used for trial. Illustrates size and compactness of the vehicle, including cabin, and also articulated steering arrangement.

Rear of vehicle complete with 300 litre storage tank.

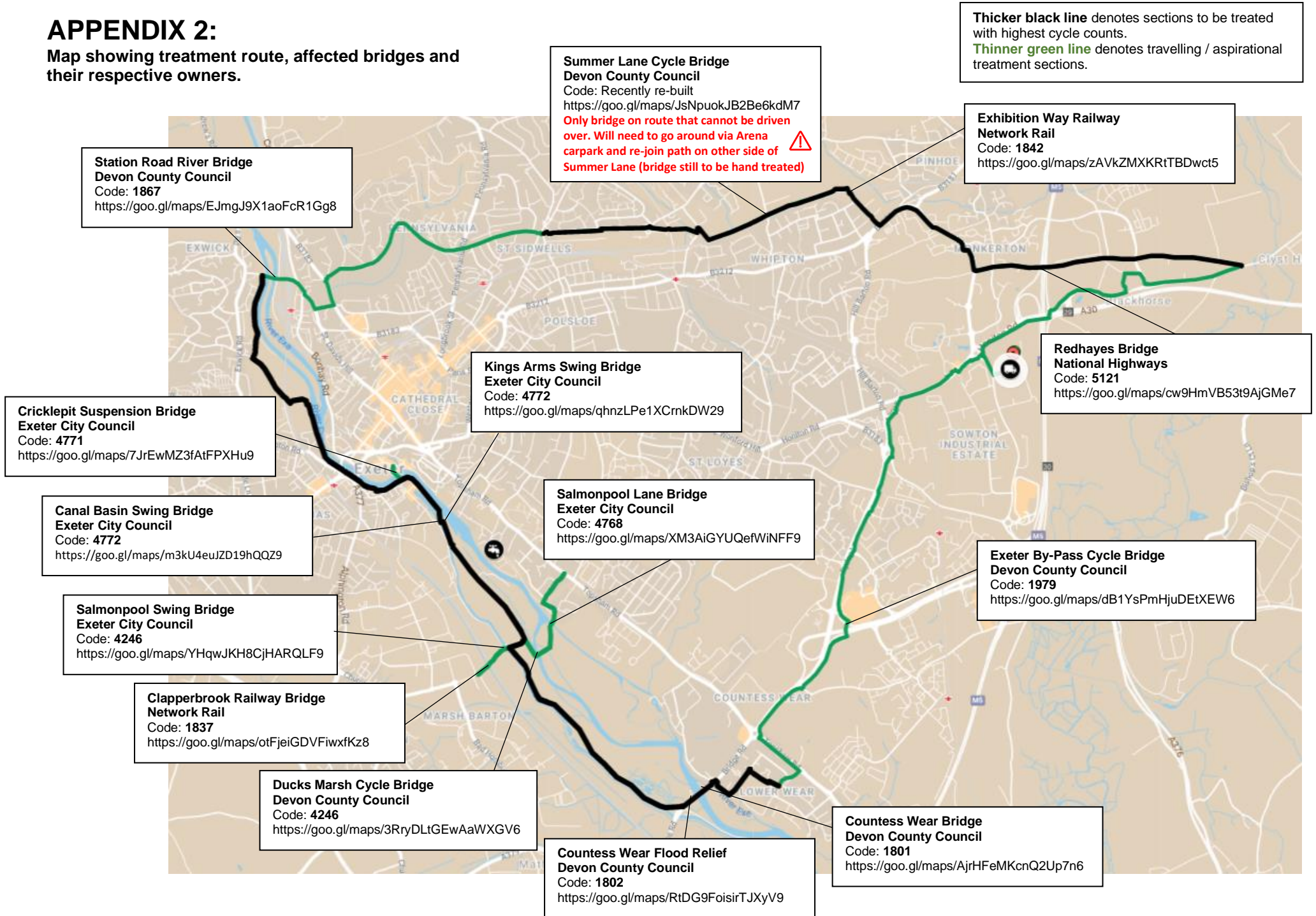


Front of vehicle with view of cabin housing, offering good panoramic visibility and also sweeper attachment.

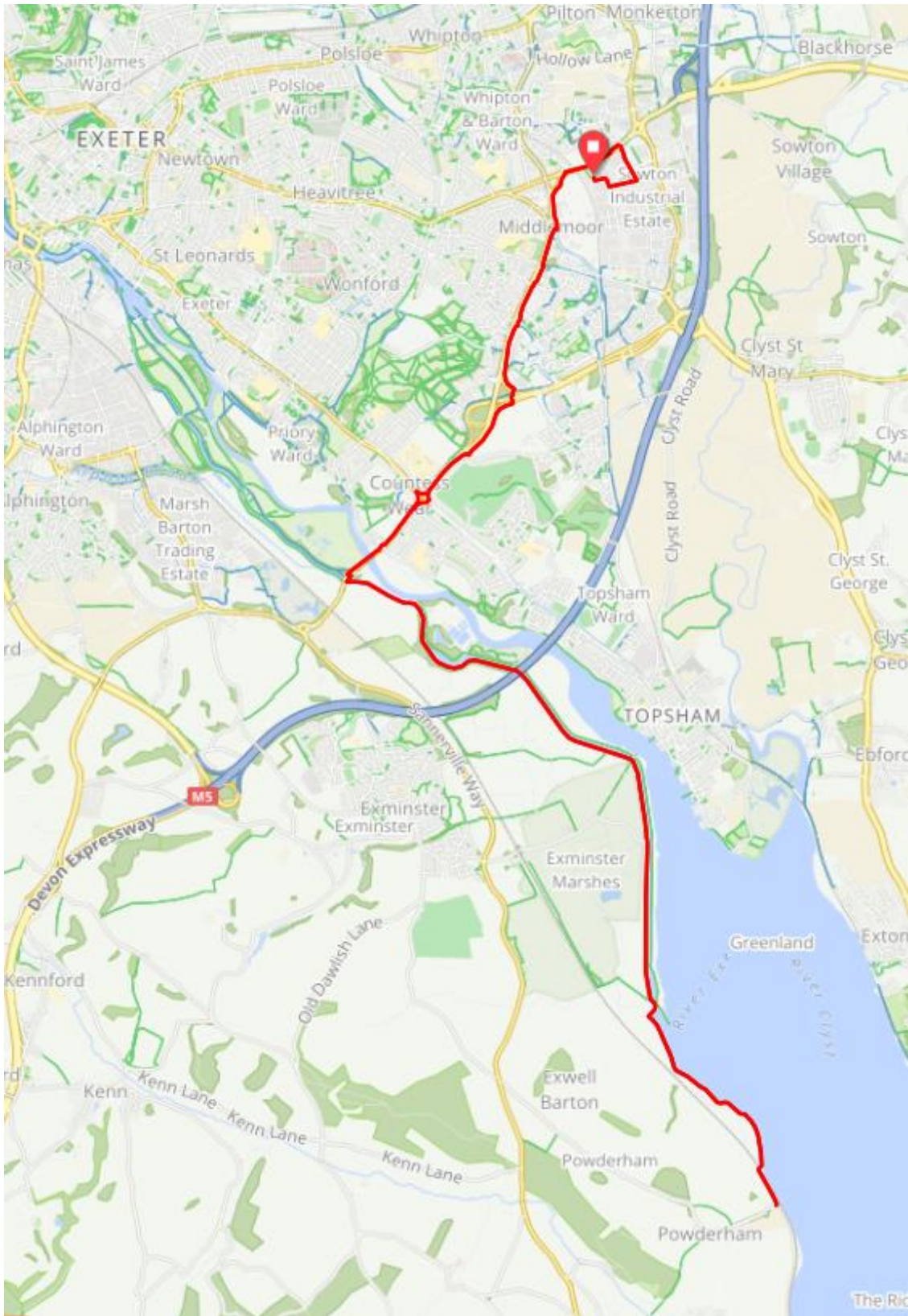


## APPENDIX 2:

Map showing treatment route, affected bridges and their respective owners.



### APPENDIX 3: Exe Estuary trialed route



**APPENDIX 4:**  
**Quotation for Powerflex 3330**

**REDACTED**



## APPENDIX 5:

### Cycle count data for Friday 1<sup>st</sup> April, morning after first treatment

All sites							
All Channels							
	Fri	Fri	Fri	Fri	Total	Average Fridays in march	01/04/2022
	2022-03-04	2022-03-11	2022-03-18	2022-03-25	Total for March Fridays	Average Fridays in march	Friday after salting
<b>Total All Sites 5am-12pm</b>	<b>1219</b>	<b>406</b>	<b>1260</b>	<b>969</b>	<b>3854</b>	<b>1035.25</b>	<b>1095</b>

Prince Charles Road - All							
All Channels							
	Fri	Fri	Fri	Fri	Total	Average Fridays in march	Fri
	2022-03-04	2022-03-11	2022-03-18	2022-03-25			2022-04-01
Total 5am-12pm	134	66	167	163	530	132.5	138

Exeter - Pinhoe Road, E4 Route, Vehicle and Cycle							
All Channels							
	Fri	Fri	Fri	Fri	Total	Average Fridays in march	Fri
	2022-03-04	2022-03-11	2022-03-18	2022-03-25			2022-04-01
Total 5am-12pm	121	43	111	123	398	99.5	105

Haven Banks							
All Channels							
	Fri	Fri	Fri	Fri	Total	Average Fridays in march	Fri
	2022-03-04	2022-03-11	2022-03-18	2022-03-25			2022-04-01
Total 5am-12pm	365	105	373	431	1274	318.5	334

Prince Charles Road Lower							
All directions							
	Fri	Fri	Fri	Fri	Total	Average Fridays in march	Fri
	2022-03-04	2022-03-11	2022-03-18	2022-03-25			2022-04-01
Total 5am-12pm	78	45	91	79	293	73.25	87

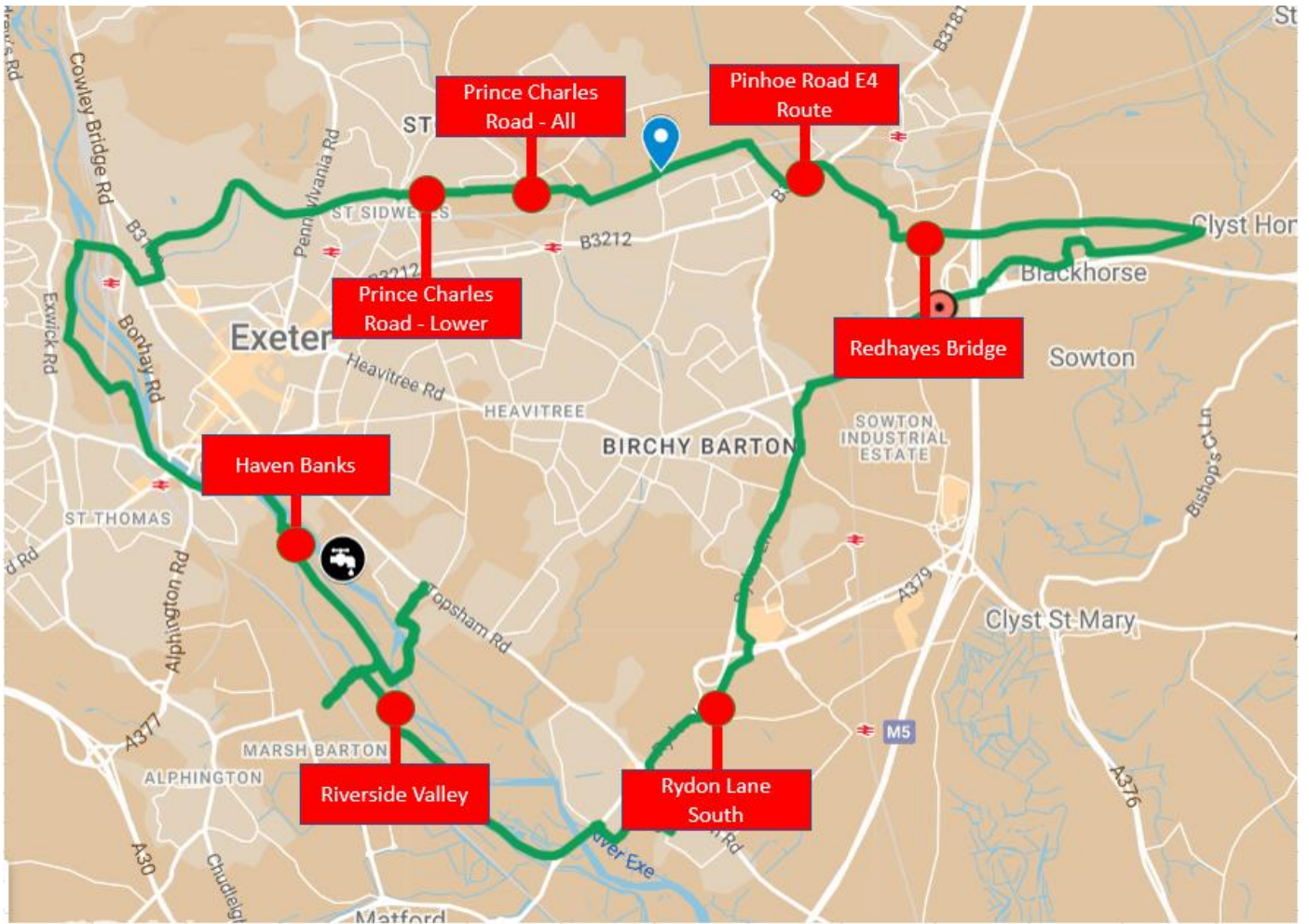
Redhayes Bridge							
All directions							
	Fri	Fri	Fri	Fri	Total	Average Fridays in march	Fri
	2022-03-04	2022-03-11	2022-03-18	2022-03-25			2022-04-01
Total 5am-12pm	68	21	54	81	224	56	63

Riverside Valley							
All directions							
	Fri	Fri	Fri	Total	Average Fridays in march	Fri	
	2022-03-04	2022-03-11	2022-03-18			2022-04-01	
Total	374	101	386	861	287	308	

Rydon Lane South							
All directions							
	Fri	Fri	Fri	Fri	Total	Average Fridays in march	Fri
	2022-03-04	2022-03-11	2022-03-18	2022-03-25			2022-04-01
Total 5am-12pm	79	25	78	92	274	68.5	60




## Cycle counter locations



# APPENDIX 6:

**Exeter Cycling** @ExeterCycling

Excellent work by the county and city council.



news.exeter.gov.uk  
**Plan to keep Exeter's busiest cycle routes moving during wi...**  
A new piece of equipment is being trialled to help ensure that the city's busiest cycle routes can keep moving next winter.

4:33 pm · 30 Mar 2022 · Twitter Web App

6 Retweets 1 Quote Tweet 26 Likes

**Dave Church** @exeterhatter · 30 Mar  
Replying to @ExeterCycling  
Great work banging the drum on this one!

**Ed Donohue** @ed\_don · 30 Mar  
Replying to @ExeterCycling  
It is great to hear @ExeterCouncil and @DevonCC are looking at measures to keep cycle routes open in cold weather

**mike walton** @miketwalton · 30 Mar  
Replying to @ExeterCycling  
I'm so thrilled to read this.

It's a big win for the people of Exeter and a manifestation of 'making cycling and walking the first choice for short journeys' in the city


Thank you @DevonCC @ExeterCouncil

**mike walton** @miketwalton · 30 Mar  
Replying to @ExeterCycling  
I'd like to think too that this is a vindication of persistent, polite well-informed campaigning

Show replies

**Birdy** @BiddyBike · 30 Mar  
Replying to @ExeterCycling  
Hurray. I think to think it's a result of persistent campaigning like this that we've finally got a small breakthrough. Let's make sure it's relevant & timely.

**Exeter Cycling** @ExeterCycling · 6 Jan 2021  
There's ice on the cycle paths & once again people who cycle are suffering serious injuries because our Highway authority are not taking those injuries seriously & treating Exeter's cycle network.  
A thread - please read:  
[Show this thread](#)



**Emma Townsend** @EmmaTow70402880 · 30 Mar  
Replying to @ExeterCycling  
Is there a map of the routes to be included? Would be good to know where is safer on a frosty morning.

**Lorna Devenish** @LKDevenish · 30 Mar  
Replying to @ExeterCycling  
Amazing. We've been heard! 🙌