



Canal &
River Trust

Keeping people, nature & history connected

National Remote Operation – Initiation Solution



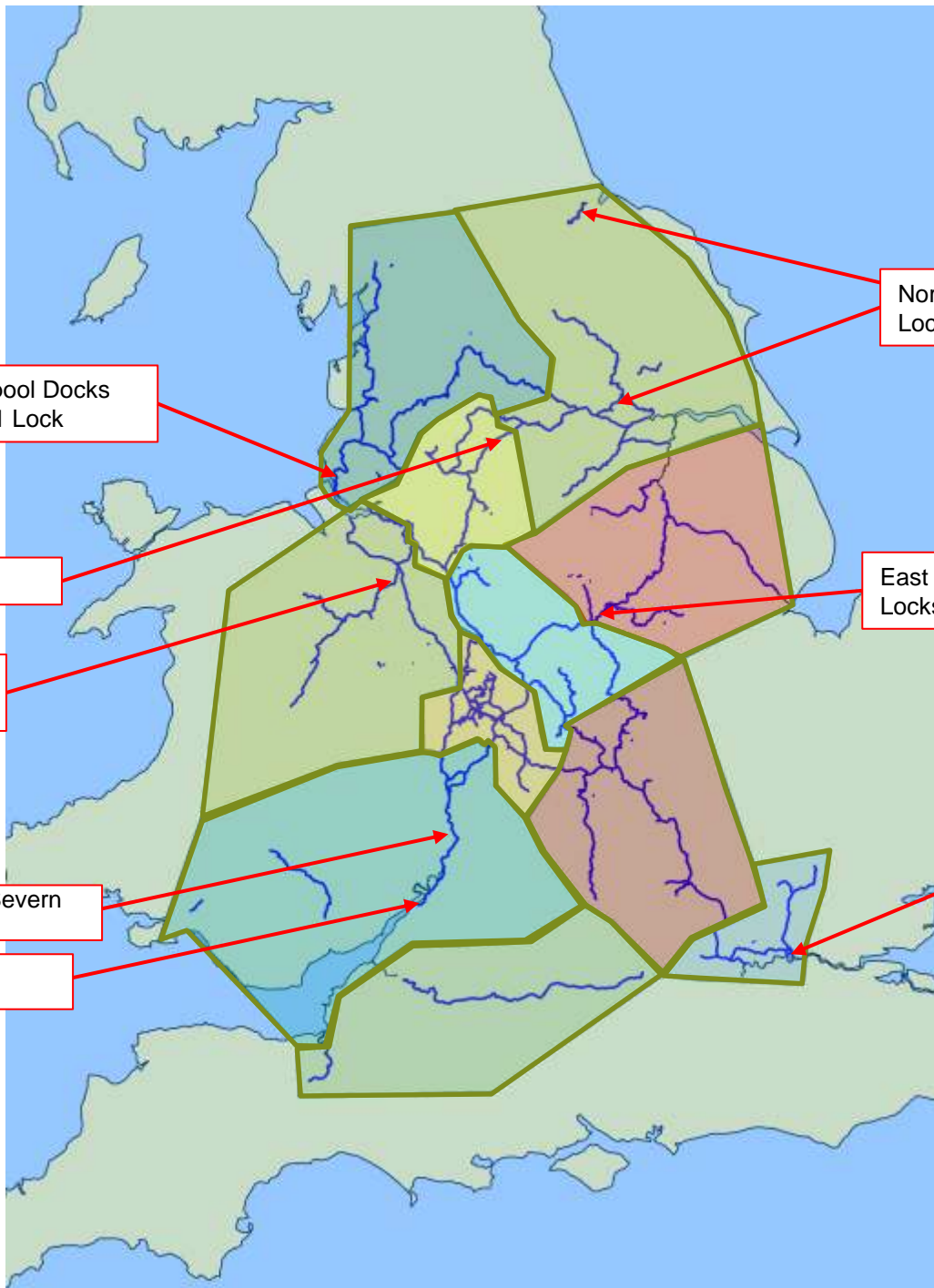


Project Aims

- Technical Solutions of Remote Operation of Manned Assets
- Completion of Feasibility Report
- Proof of Concept
- Capital Investment costs
- Review of CRT Manned Assets
- Efficiency Savings
- Cost Benefit Analysis

Work to date

- Identified 46 suitable assets
- Identified two technical solutions for lock & bridge sites
- Proof of concept being carried out through September



North East: 5 no. A&C Locks & Tees Barrage

North West: Liverpool Docks
2no. Bridges and 1 Lock

M&P: 2 no. tunnels

East Midland: 4 no. Trent Locks

NW & Borders: *2 no. Locks & *4 Bridges

SW & Severn: 7 no. R. Severn Locks

London: 3 no. Locks & 1 Bridge

SW & Severn: 14 no. G&S Bridges







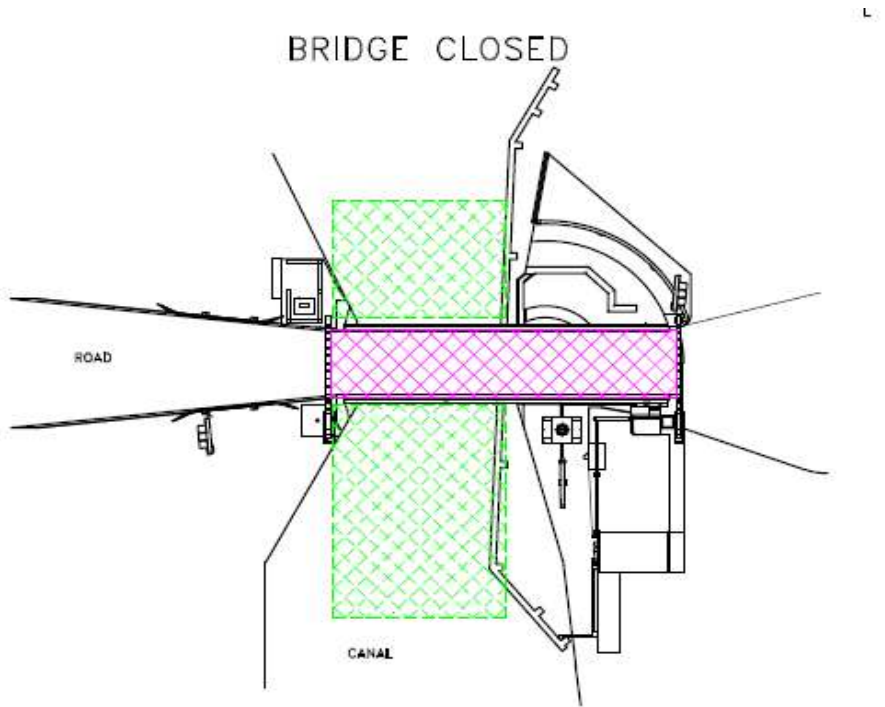




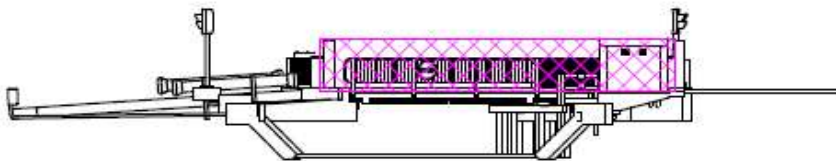
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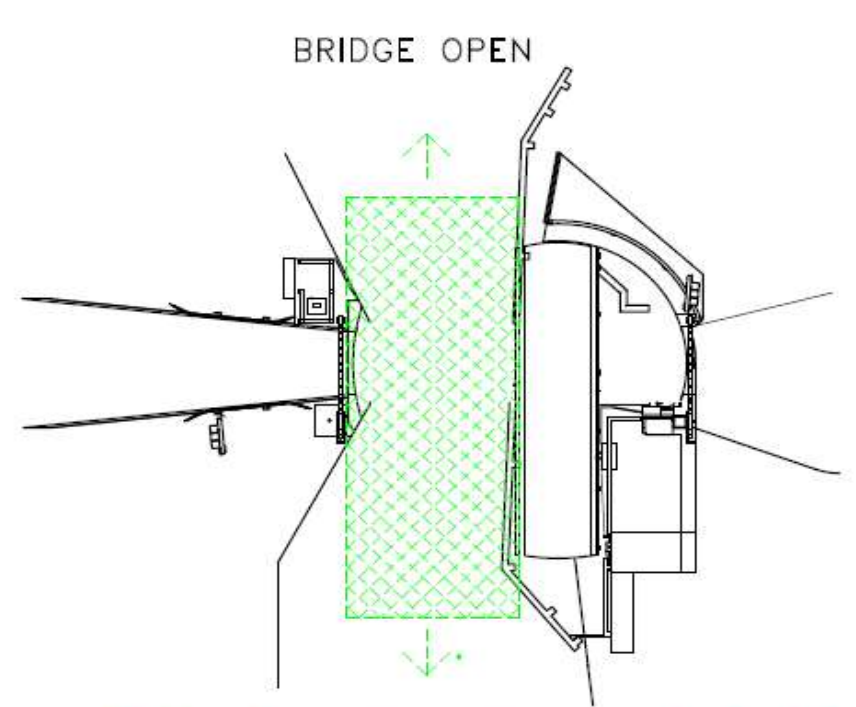
User Initiation Operation



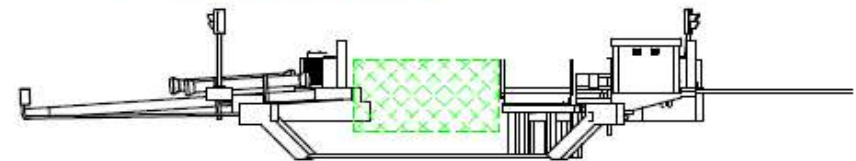
NOTE: Zone B detection of opening is only required for swing bridges.



 Zone A - detection of vehicles and persons



* Zone B is shown of minimum extent necessary to ensure boats are clear of closing bridge. In some cases this zone may need to be extended for some distance down the canal in either direction to ensure boats which may have passed the canal traffic lights showing proceed are detected before bridge movement starts.

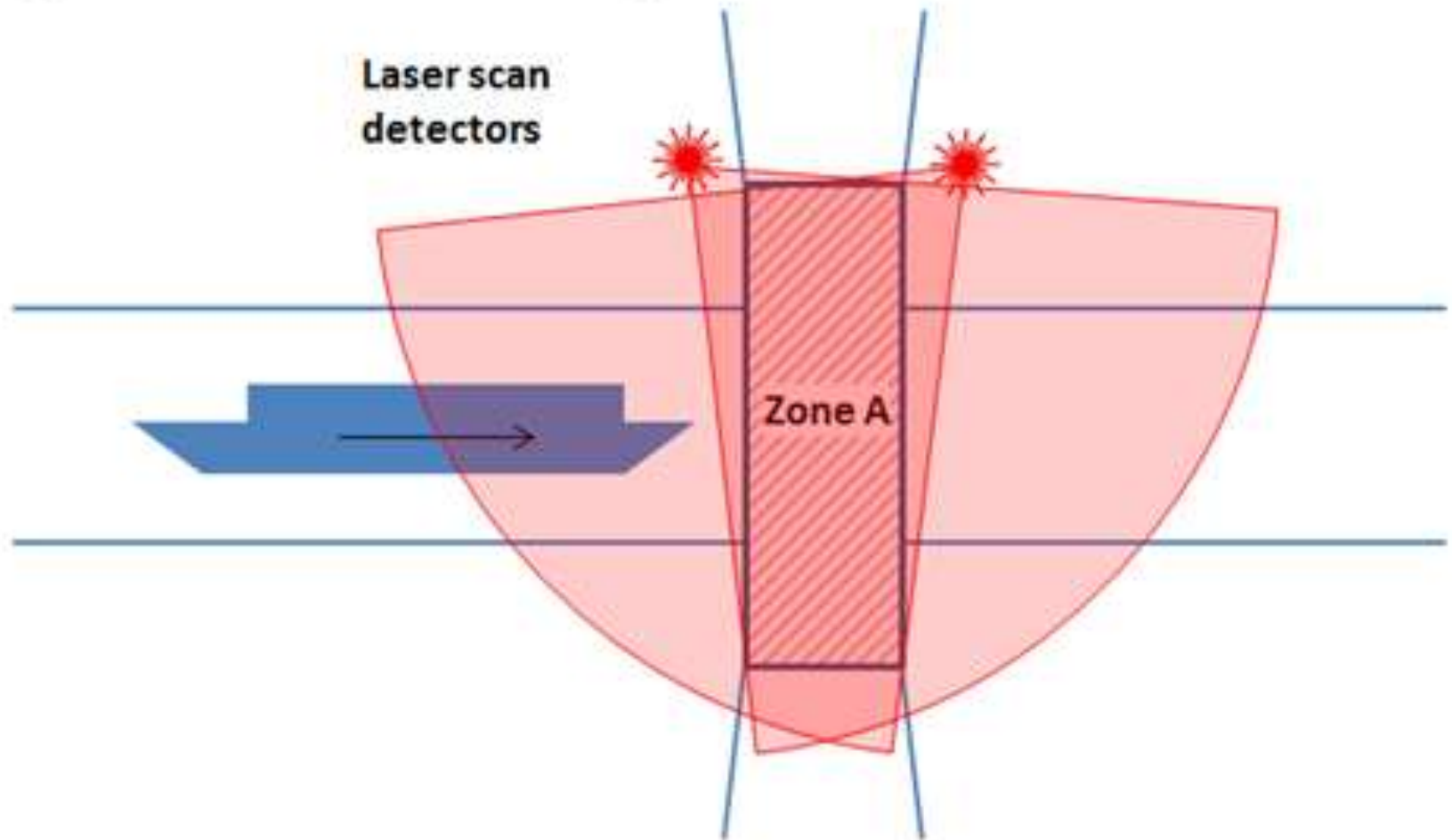


 Zone B - Detection of boats and waterborne objects

DRAWINGS TO ILLUSTRATE GENERAL PRINCIPLE ONLY
Zones may be varied to suit available technology and will be subject to site conditions and risk assessments

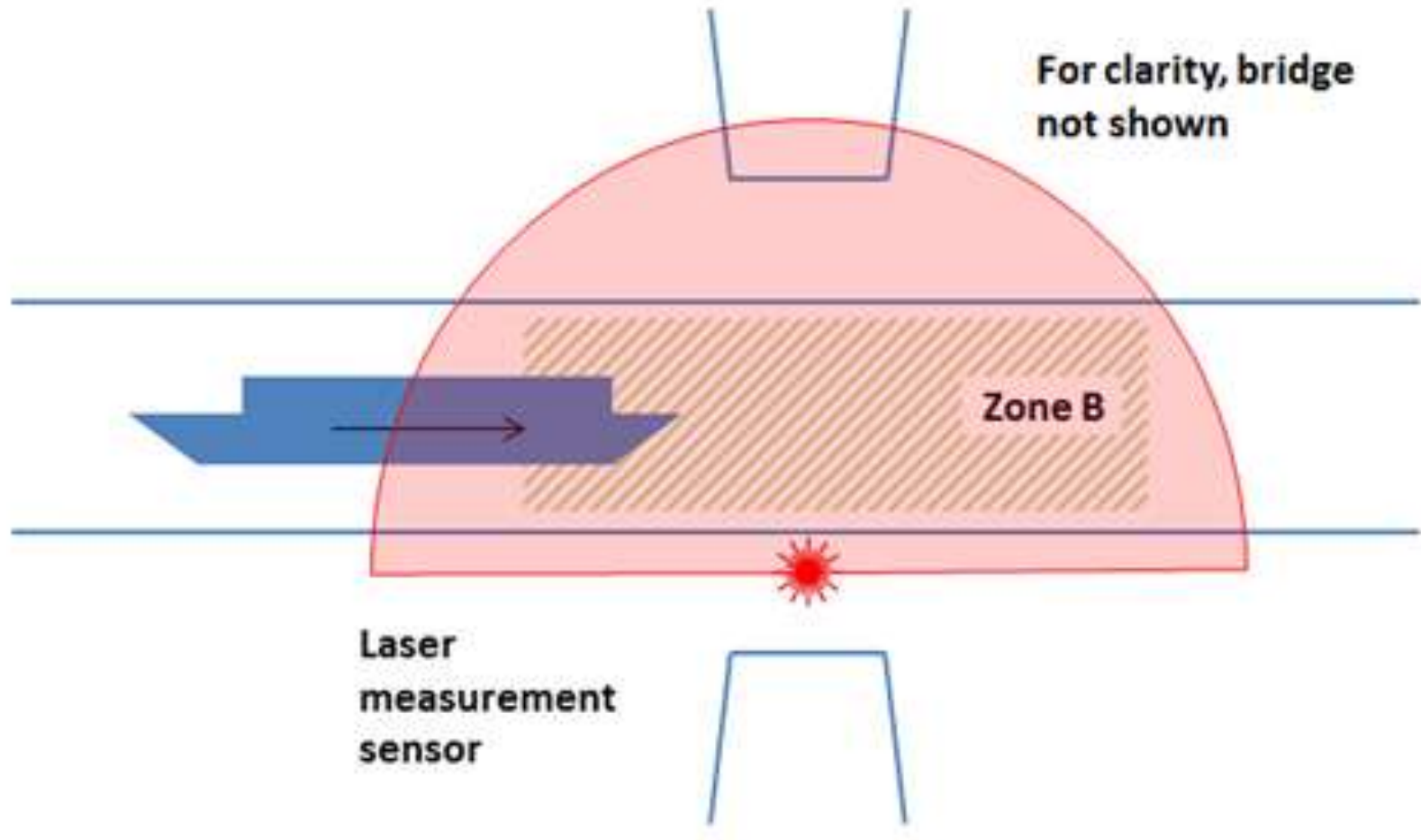
Bridge Solution

Figure 4-4: Detection in Zone A using TEW lidar scanner



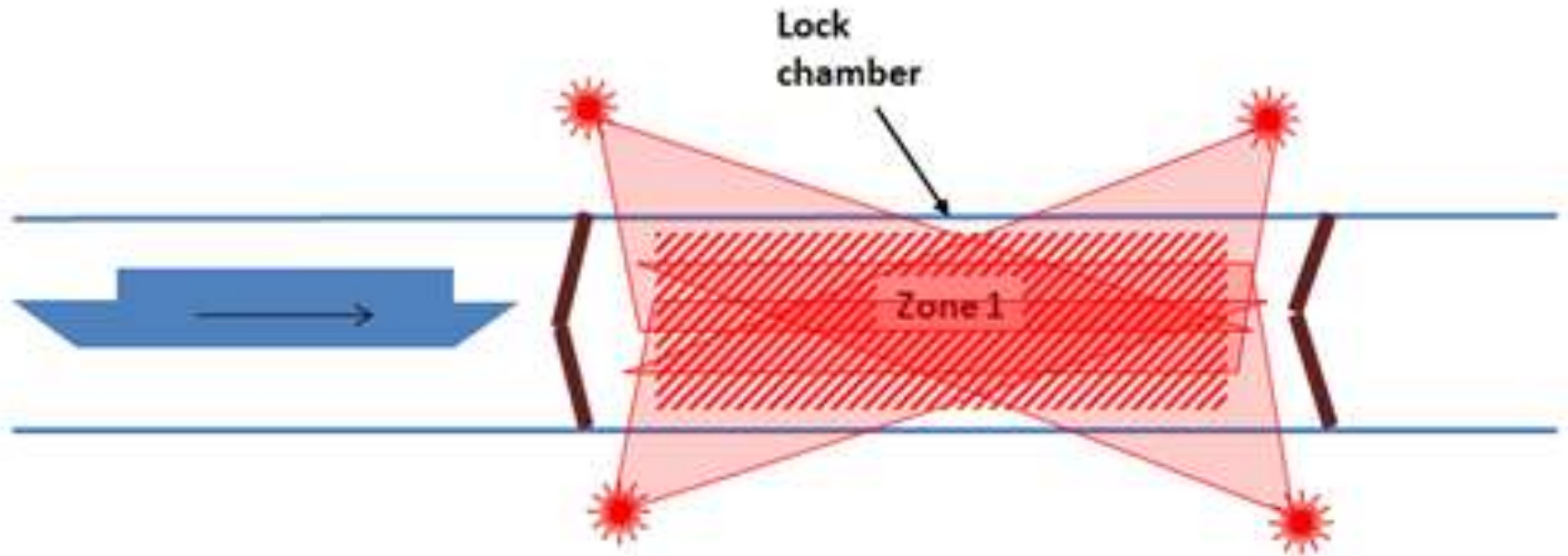
Bridge Solution

Figure 4-6: Detection in Zone B using laser measurement sensor



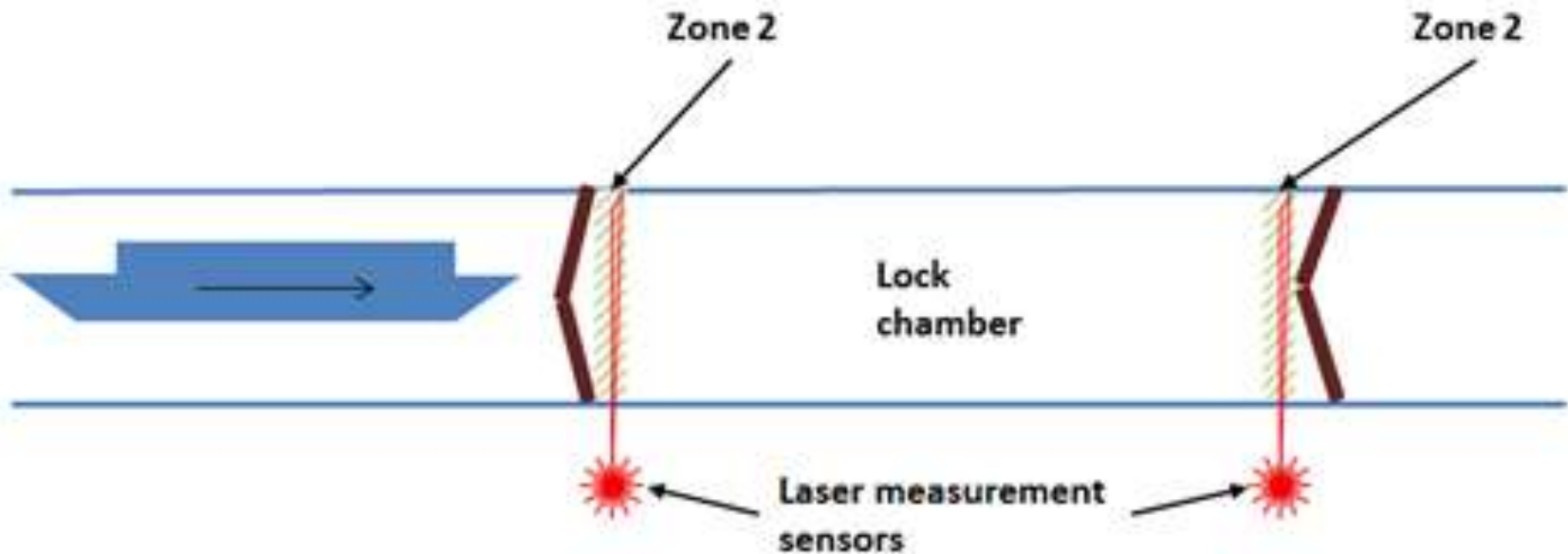
Lock Solution

Figure 4-8: Detection in Zone 1 using Sick LMS



Lock Solution

Figure 4-10: Detection in Zone 2 using Sick LMS



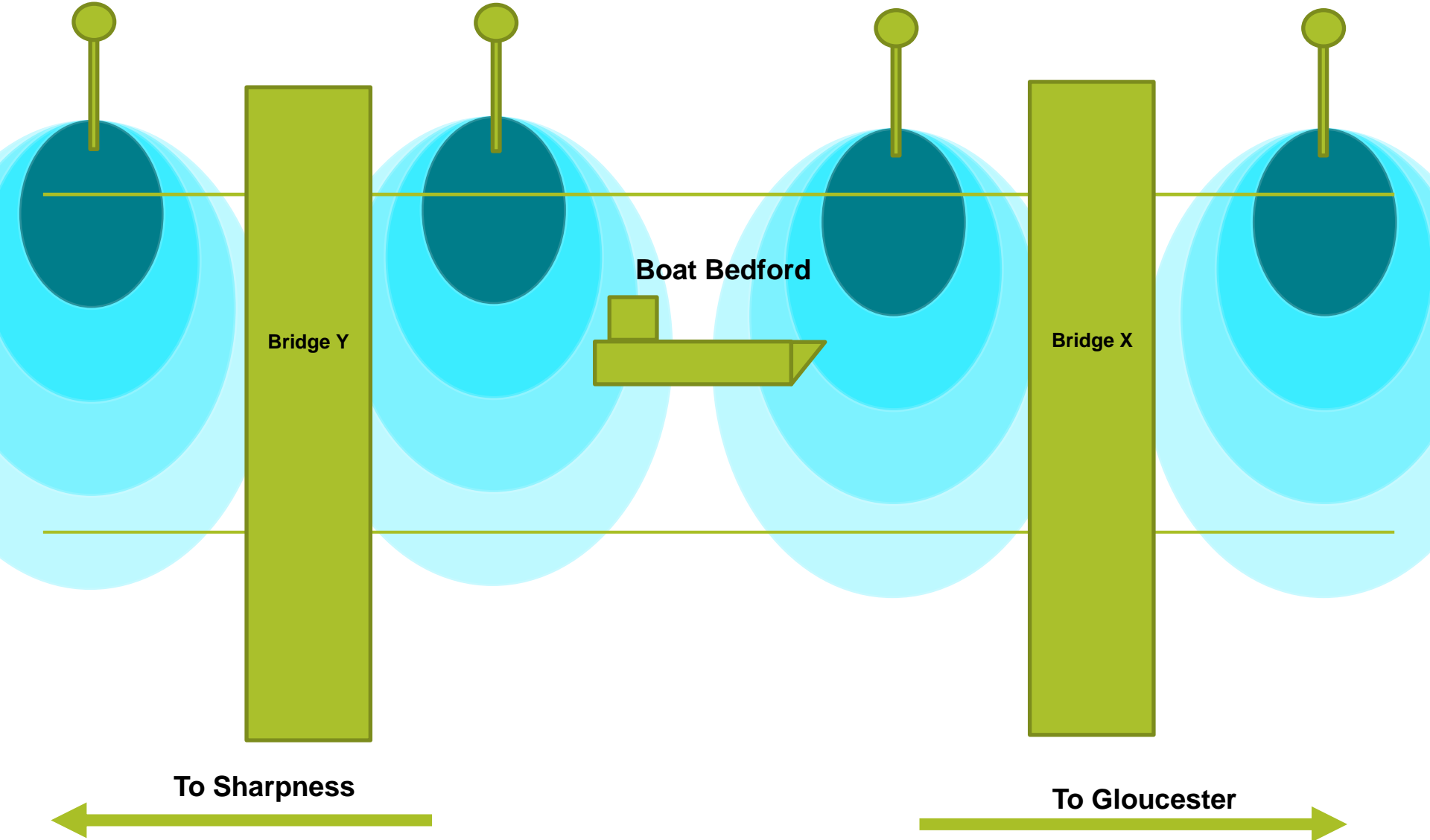
Scenario 1 - Single boat request for operation

Beacon to broadcast SSID name
"Bridge Y to Gloucester"

Beacon to broadcast SSID name
"Bridge Y to Sharpness"

Beacon to broadcast SSID name
"Bridge X to Gloucester"

Beacon to broadcast SSID name
"Bridge X to Sharpness"



CRT – Remote Operation App

Boat Bedford has entered two WiFi zones, Bridge X to Gloucester and Bridge Y to Sharpness
App Screen 1.



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Welcome to the CRT Remote
Operation device.

Two Hot spots are available.

Please select direction of travel & bridge to
operate

**Press to Select Bridge X
To Gloucester**

**Press to Select Bridge Y
To Sharpness**

If assistance is required call
0800 555555

Boat Bedford has selected to operate Bridge X to
Gloucester.
App Screen 2.



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**Connected to Bridge X To
Gloucester**

Press to open Bridge X

**Press to go Back to
Previous page**

If assistance is required call
0800 555555

CRT – Remote Operation App

The App screen will automatically update with instructions and information.
App Screen 3.



Connected to Bridge X To Gloucester

Bridge X is opening

Please remain behind the navigation traffic lights and wait further instruction.

If assistance is required call
0800 555555

The App screen will automatically update with instructions and information.
App Screen 4.



Connected to Bridge X To Gloucester

Bridge X is open

Please proceed with caution, boats may be approaching from the opposite direction.
Keep to the left and proceed beyond the far navigation lights .

If assistance is required call
0800 555555