

## North Yorkshire Council

# VICTORIA AVENUE - ACTIVE TRAVEL FUND

Bi-directional Central Cycle Track - Feasibility





### North Yorkshire Council

### **VICTORIA AVENUE - ACTIVE TRAVEL FUND**

Bi-directional Central Cycle Track - Feasibility

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**WSP** 

Mount View Standard Way Business Park Northallerton DL6 2YD

WSP.com



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#### **EXECUTIVE SUMMARY**

North Yorkshire Council requested a feasibility study for a central bi-directional cycle track on Victoria Avenue, between A61 West Park and A61 Station Parade. North Yorkshire Council commissioned WSP to evaluate the practicality and implications installing this would cause, focusing on safety, accessibility, and infrastructure impact.

Three options were explored to incorporate the central cycle track:

Option One: Prohibits all right turns from side roads and accesses off Victoria Avenue.

- Advantages: Reduces cyclist and vehicle conflict, aligns with LTN 1/20 principles, and promotes cycling
- Disadvantages: Increases journey times for motor vehicle users, requires detours into the town centre, and potential for objections

Option Two: Similar to Option One but includes a gap within the cycle track at the west for vehicle u-turns.

- Advantages: Provides access to Station Parade without entering the town centre.
- Disadvantages: Collison risk between cyclists and vehicles performing the u-turn, unconventional road position of cyclists, potential congestion points, and potential public objections.

Option Three: Permits right turns out of Belford Road but prohibits right turns from all other accesses on Victoria Avenue.

- Advantages: Direct access to Station Parade for motor vehicle users leaving Belford Road
- Disadvantages: Complex layout with collision risk between pedestrians, cyclists and vehicles, non-compliant with LTN 1/20 principles, and non-direct route to Station Parade for other accesses on the south side of Victoria Avenue

Due to the significant health and safety risks associated with any feasible option, as well as operational issues, it is recommended not to proceed with the central bi-directional cycle track. Alternative options for cycle infrastructure along Victoria Avenue should be explored.





#### 1.0 BACKGROUND INFORMATION



Figure 1 - Victoria Avenue, Harrogate - looking eastbound (Google Maps, 2024)

Following feedback from Active Travel England on the preliminary Active Travel Funded 2 Pedestrian Improvement Scheme, Active Travel England requested for a feasibility study to be undertaken for installing a central bi-directional cycle track through Victoria Avenue, between A61 West Park and A61 Station Parade. In response to this feedback, North Yorkshire Council commissioned WSP to conduct a feasibility study. The aim of the study is to evaluate the practicality and implications of installing the bi-directional central cycle track, considering various factors including safety, accessibility, and impact on the existing infrastructure.

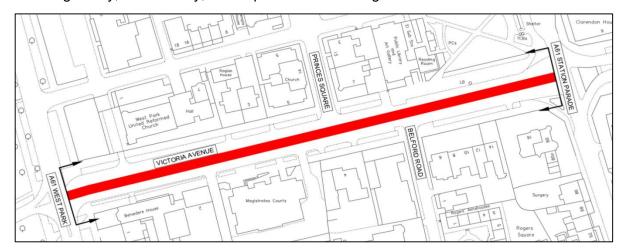


Figure 2 - Location Plan of the Site

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#### 1.1 ASSUMPTIONS

Utilising AutoCAD's vehicle tracking tool, it has been determined that vehicles larger than a 7.5 tonne rigid vehicle are currently unable to manoeuvre out of the junction of Belford Road onto Victoria Avenue under the current layout. Consequently, the feasibility study assumes that larger vehicles will not need to egress from this junction in any new proposed layout.





#### 2.0 REGULATIONS & GUIDANCE

To assess the feasibility of the bi-directional central cycle track, the following regulations and guidance were reviewed:

# 2.1 LOCAL TRANSPORT NOTE (LTN) 1/20 CYCLE INFRASTRUCTURE DESIGN

The following sections summarise the guidance that was used from LTN 1/20 in order to carry out the feasibility study of the bi-directional cycle track.

#### 2.1.1 'TABLE 6-2: TWO-WAY CYCLE TRACKS: OPPORTUNITIES & CHALLENGES':

Several challenges mentioned within this table are relevant to Victoria Avenue and must be considered when deciding the feasibility of a central cycle track. These challenges include:

- The design can be unintuitive and generate risks associated with motorists and pedestrians not looking both ways when crossing the track.
- There are potential safety concerns at side roads and accesses.
- Connectivity for cyclists to and from the track can be difficult to manage.

#### 2.1.2 'TABLE 5-2: CYCLE LANE AND TRACK WIDTHS':

This table states that a two-way cycle track accommodating fewer than 300 cycles per hour has a desirable minimum width of 3.0m and an absolute minimum of 2.0m at constraints.

#### 2.1.3 'TABLE 5-3: ADDITIONAL WIDTH AT FIXED OBJECTS':

This table states the increased width of the cycle track required at varying heights of fixed objects, as detailed below:

- No additional width is required when the cycle track is flush or near flush, including low and splayed kerbs up to 60mm high.
- An additional 200mm width is required when the cycle facility is adjacent to kerbs 61mm to 150mm high.
- An additional 250mm width is required when there is an adjacent vertical feature from 151mm to 600mm high.
- An additional 500mm width is required when there is an adjacent vertical feature above 600mm high.





# 2.1.4 'TABLE 6-1: MINIMUM RECOMMENDED HORIZONTAL SEPARATION BETWEEN CARRIAGEWAY AND CYCLE TRACKS':

LTN 1/20 states in table 6-1 that for a 30mph road, such as Victoria Avenue, the desirable minimum horizontal separation (buffer) is 0.5m, while the minimum horizontal separation is 0m.

#### 2.2 MANUAL FOR STREETS

#### 2.2.1 SECTION 6.7: EMERGENCY VEHICLES:

The above section of Manual for Streets includes the Building Regulation requirement B5 (2000) concerns 'Access and Facilities for the Fire Service, and section 17 includes advice on the vehicle access and states that there should be a minimum carriageway width of 3.7m between kerbs to allow access for emergency vehicles.

#### 2.2 GUIDANCE ON THE USE OF TACTILE PAVING

Section 3 of the 'Guidance on the Use of Tactile Paving Surfaces' states that corduroy surface should be used at transitions between a footway or footpath, and areas permitted to be shared by pedestrians and cyclists and should be laid to a depth of 800mm.

#### **2.3 DMRB**

# 2.3.1 CD123 - GEOMETRIC DESIGN OF AT-GRADE PRIORITY AND SIGNAL CONTROLLED JUNCTIONS

Section 7 of CD123 gives details on the geometric design of signal-controlled junction, and states that at existing junctions the straight-ahead lane should be a minimum of 2.5m for a road that needs to make provision for HGVs. It also states that dedicated left or right turns should be a minimum of 3.0m wide, however the existing right turn lane is 2.9m.





#### 3.0 TECHNICAL FEASIBILITY

As part of the feasibility study three options have been explored that meet the criteria for the bidirectional central cycle track. Each option has its own advantages and limitations, which are detailed in the following sections.

#### 3.1 CONSTANT FACTORS

The following factors remain constant across all options:

- A 2.5m wide central bi-directional cycle track. Due to the constraints with the available width
  within the site the recommended 3.0m wide cycle track is not possible. It is recognised that
  this is the absolute minimum width at constraints for >300-1000 cycles per hour, however
  there is no further available space.
- A 60mm high, 300mm wide cycle segregation unit (CSU) buffer on either side of the cycle track

#### 3.2 OPTION ONE

This option prohibits all right turns from any side roads or accesses off Victoria Avenue. Vehicles exiting accesses on the south side would have to turn left onto A61 West Park and into the town centre to return to A61 Station Parade. Appendix A shows a plan of the proposal.

#### 3.2.1 ADVANTAGES

- Reduces Conflict: Eliminates potential conflicts between vehicles turning right and cyclists using the cycle track.
- Safety and Compliance: Aligns with LTN 1/20 core design principles, prioritising safety and direct routes for cyclists.
- Promotes Cycling: Dedicated space for cyclists may encourage more people to cycle, promoting active travel.

#### 3.2.2 DISADVANTAGES

- General Operation & Safety Concerns: Discussed in Section 4.1.
- Increases Journey Times: Increases journey times and congestion within the town centre for road users from Belford Road and other accesses on the south side, due to lack of direct access to Station Parade.
- **Detours for North Side Users:** Requires road users from the north side accesses to travel additional distance, out of town via the A61 Station Parade to either get back into town, or to access properties on the south side (U-turns banned at Station Parade junction).
- **Detours for South Side Users:** Requires road users from the south side accesses to travel additional distance to access A61 Station Parade to head out of town.
- **Potential Objections:** Likely to face objections during consultation, particularly regarding the ban on right turns from Belford Road.





#### 3.3 OPTION TWO

Similar to option 1, this option bans right turns from all side roads and accesses but includes a gap in the cycle track at the west end of the site. This allows vehicles to turn left out of Belford Road and other accesses on the south side, then perform a u-turn to head eastbound towards A61 Station Parade. Cyclists would give way to turning vehicles. This option is shown in Appendix B, including the vehicle tracking of the U-turn manoeuvre.

#### 3.3.1 ADVANTAGES

 Direct Access: Provides nearly direct access to Victoria Avenue eastbound without the need to enter the town centre.

#### 3.3.2 DISADVANTAGES

- General Operation & Safety Concerns: Discussed in Section 4.1.
- **Detours for North Side Users:** Requires road users from the north side accesses to travel additional distance, away from the town centre via the A61 Station Parade to either get back into the town centre, or to access properties on the south side (U-turns banned at Station Parade junction).
- Collision Risk: Potential for collisions if cyclists do not obey give way markings.
- Unconventional Road Positioning: The u-turn manoeuvre for vehicles, combined with
  cyclists riding in an unconventional position on the road, may lead to confusion and increase
  the risk of collisions.
- Congestion Point: The dedicated U-turn gap could become a congestion point, particularly in peak hours, with vehicles waiting to turn. This could either prevent cars from reaching A61 West Park or they will squeeze past, potentially leading to a collision.
- Vehicles Blocking Cycle Track: U-turning vehicles may block the cycle track if they begin the manoeuvre but cannot complete it due to vehicles travelling east bound on Victoria Avenue, which could prevent cyclists from continuing on the cycle track until it is clear east bound.
- **Public Objections:** May receive objections, particularly if the public perceives it to be in an inconvenience.

#### 3.4 OPTION THREE

This option permits vehicles to turn right out of Belford Road onto Victoria Avenue, addressing previous objections of the pedestrian scheme that proposed to ban the right turn. Cyclists would give way to turning vehicles. Appendix C shows a plan of this option, including the vehicle tracking of those leaving Belford Road.





#### 3.4.1 ADVANTAGES

• **Direct Access:** Provides direct access to Victoria Avenue eastbound and Station Parade for vehicles exiting Belford Road.

#### 3.4.2 DISADVANTAGES

- General Operation & Safety Concerns: Discussed in Section 4.1.
- **Detours for North Side Users:** Requires road users from the north side accesses to travel additional distance, out of the town centre via the A61 Station Parade to either get back into town, or to access properties on the south side (U-turns banned at Station Parade junction).
- Indirect Routes for South Side Accesses: Other accesses on the south side, including the Magistrates' Court, would need to turn left and travel north into the town centre before being able to head south out of Harrogate.
- **Non-Compliance with LTN 1/20:** LTN 1/20 core design principles, prioritising comfortable, safe and direct routes for cyclists is not achieved.
- **Collision Risks:** Creates an increased risk for collisions as cyclists share areas with other users, including pedestrians and vehicles.
- **Complex Layout:** The Complex layout of the gap in the cycle track immediately after the staggered parallel crossing may lead to confusion of both cyclists and motorists, increasing the risk of collisions.

#### 3.5 ALTERNATIVE OPTIONS

There are several variables that can be implemented across the above options, which are discussed below.

#### 3.5.1 VEHICLE MANOEUVRING

To accommodate up to 7.5 tonne rigid vehicles turning left out of Belford Road with the new width of the island required for shared use space, two options are available:

- A. **Reduce the south build out by 0.5m** to allow a 4.2m carriageway width, enabling 7.5 tonne rigid vehicles to turn left out of Belford Road. Figure 3 shows this option.
- B. Amend the Traffic Regulation Orders (TROs) on Belford Road to move the parking bays to the west side, facilitating easier left turns for 7.5 tonne rigid vehicles. This is the preferred option of the two to accommodate 7.5 tonne vehicles turning left out of Belford Road. This is because it simplifies the manoeuvre and reduces the need to alter kerblines. However, it may face objections due to the relocation of parking. This option is shown on both option one and option three, but it can be implemented across any of the three options. Figure 4 shows this option.





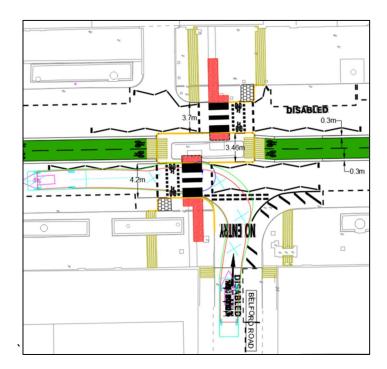


Figure 3 – Option A to accommodate the left turn out of Belford Road

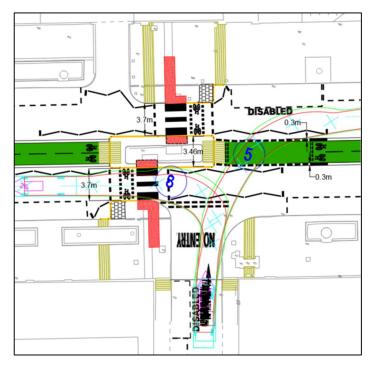


Figure 4 – Option B to accommodate the right and left turn out of Belford Road

#### 3.5.2 CYCLIST PRIORITY

Two options can be explored regarding cycle priority:





- A. Prioritise cyclists in accordance with LTN 1/20 principles by requiring vehicles to give way at the gap in the cycle track for options 2 and 3. However, this increases the risk of collisions, as vehicles travelling west and making a u-turn will need to watch for two lanes of cycle traffic moving in opposite directions and one lane of vehicular traffic heading eastbound before making the turn.
- B. **Prioritise vehicles** crossing the cycle track at the gap, which would contravene LTN 1/20 principles of being direct and comfortable for cyclists.

#### 3.6 CONSTRUCTION FEASIBILITY

To ensure the feasibility of constructing the pedestrian and cycle schemes in two separate stages, several considerations must be addressed. During the pedestrian construction phase, some abortive works may be necessary, as it would be later altered again during the cycling construction phase, which would not appear as a productive use of money to members of the public. Alternatively, elements of the cycling scheme could be implemented during the pedestrian construction phase. However, this would result in undesirable arrangements until the cycling scheme is constructed.

The island at the staggered zebra crossing will need to be widened beyond the initial proposal for the pedestrian scheme. The island could be widened to the required width for the cycle scheme during the pedestrian phase in Spring 2025. However, this would result in lane widths of 3.7m. However, according to Table 7-2 of LTN 1/20, 3.7m is not an acceptable width for cycling within mixed traffic. This issue would persist until the central cycle track is implemented, which funding would still need to be secured.

Although Active Travel England are not in favour of shared use space, to facilitate the central cycle track, short lengths of shared use will need to be established in the footway and within the traffic island with the inclusion of corduroy paving. This measure would be intended to warn pedestrians crossing at the staggered crossing that they are entering a shared use area, where there could be potential conflicts with cyclists. The zebra crossing would require to be upgraded to a parallel crossing, to avoid cyclists dismounting when exiting the cycle track. The upgrade will necessitate slight widening of the build-out, although it will not affect the zebra crossing's location and therefore will not alter the Traffic Regulation Orders (TROs). The pedestrian scheme could incorporate the upgrade to a parallel crossing to avoid abortive works. However, this will mean that there is an absence of a direct link for cyclists from the shared use areas until the cycle track is constructed.





#### 4.0 RISK ANALYSIS

In addition to the individual risks outlined in each of the above options, further risks were highlighted upon discussion with a CDM Advisor, who raised concerns on both the operation of the central cycle track in terms of safety, as well as construction and maintenance considerations, which are discussed further below.

#### 4.1 OPERATION AND ROAD SAFETY CONSIDERATIONS

#### 4.1.1 RIGHT TURN INTO VICTORIA AVENUE

Cyclists turning right into Victoria Avenue will need to stay in the centre of the carriageway to enter the cycleway. This unusual manoeuvre may confuse following vehicles, which typically expect cyclists to stay on the nearside. Limited visibility of the cycle track's start could lead to late movements and potential conflicts. This issue is more pronounced at the Station Parade junction due to the large central island restricting visibility. Removing the central island and narrowing the carriageway could mitigate this concern, making the cycle track more visible to all road users. However, this island is used to facilitate a two-stage pedestrian crossing, operating in two phases.

#### **4.1.2 EXIT FROM VICTORIA AVENUE**

Cyclists exiting Victoria Avenue will need to manoeuvre from the cycle track to the holding area at the advanced stop line. To proceed straight-on, they must position themselves to the left or centre of the cycle box, which involves making an almost 90-degree turn. Phasing traffic signals to release cyclists earlier than other traffic could help reduce the risks.

#### 4.1.3 LEAVING AND JOINING THE CYCLE TRACK

Cyclists crossing Victoria Avenue to access properties face a higher risk, particularly when turning left and crossing the path of vehicles approaching from behind. Cyclists will need to stop and fully assess the safety before crossing.

#### 4.1.4 CROSSING CYCLE SEGREGATION UNITS

Cyclists interacting with raised segregation units at acute angles may lose control. Entry and exit points should be wide enough to allow safe turns without sharp manoeuvres.

#### 4.1.5 PREVENTING VEHICLE ENTRY OR CROSSING

Preventing right turns along Victoria Avenue can be controlled with signs, but it does not stop drivers from performing U-turns or driving over the segregation units. Installing cycle track delineation posts could help but these require additional cycle lane width.

#### 4.1.6 ZEBRA CROSSING SHARED SPACE

The central island will be a shared space for pedestrians and cyclists, requiring careful management to avoid conflicts. Measures to highlight the shared space and encourage appropriate cycling speeds are essential. A Safety Risk Assessment and Road Safety Audit should be conducted to ensure safety performance.





#### 4.1.7 RIGHT TURN RESTRICTIONS

Restricting right turns into and from Victoria Avenue may lead to lengthy diversions, driver frustration, and unsafe manoeuvres. Robust traffic management and enforcement measures are necessary to ensure compliance.

#### 4.1.8 DRAINAGE

The design proposes 60mm high concrete cycle segregation units along the cycleway, which will trap water and debris within the cycle track due to the flat nature of Victoria Avenue (see figure 5). Elevating the cycleway to the level of the segregation units (see figure 6) will improve drainage and maintenance.



Figure 5 - Cycle Track at Carriageway Level



Figure 6 - Cycle Track at an Intermediate Level, flush with top of buffer

However, providing a cycle track flush with the cycle segregation units, creates further health and safety risks;

- Pedestrians could deem it as a 'safe space' to cross into, using it as a footway, before
  crossing the other traffic lane, which creates a risk of colliding with cyclists.
- Cyclists could drop into the carriageway, potentially colliding with vehicles, if they swerve slightly, whereas they would hit the 60mm upstand if the track was at carriageway level, providing more protection.

Gullies could also be provided within the cycle track to improve the drainage; however this would require additional cycle track width, which is not available based on the site width constraints.

# 4.2 CONSTRUCTION AND MAINTENANCE CONSIDERATIONS (CDM HAZARDS, RISK IDENTIFICATION AND REDUCTION)

#### 4.2.1 PHASED CONSTRUCTION

Works on Victoria Avenue will be phased, with pedestrian works first, followed by cycleway works. Designs should be harmonised to avoid abortive efforts and additional hazards. Future-proofing designs can minimise overall workers effort and risks. However, this is not possible due to the construction programme for the pedestrian improvement scheme.

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#### 4.2.2 STATION PARADE JUNCTION CENTRAL ISLAND

Reducing the scope of works to the minimum required width for a controlled crossing could significantly reduce workers effort and exposure to additional hazards. This should be considered to determine if a slight reduction in standards is acceptable.

#### **4.2.3 CYCLEWAY MAINTENANCE**

Regular cleaning and maintenance are essential. Raised edges could trap leaves, ice, or snow, making conventional maintenance difficult. Raising the cycleway level should be investigated to facilitate maintenance.



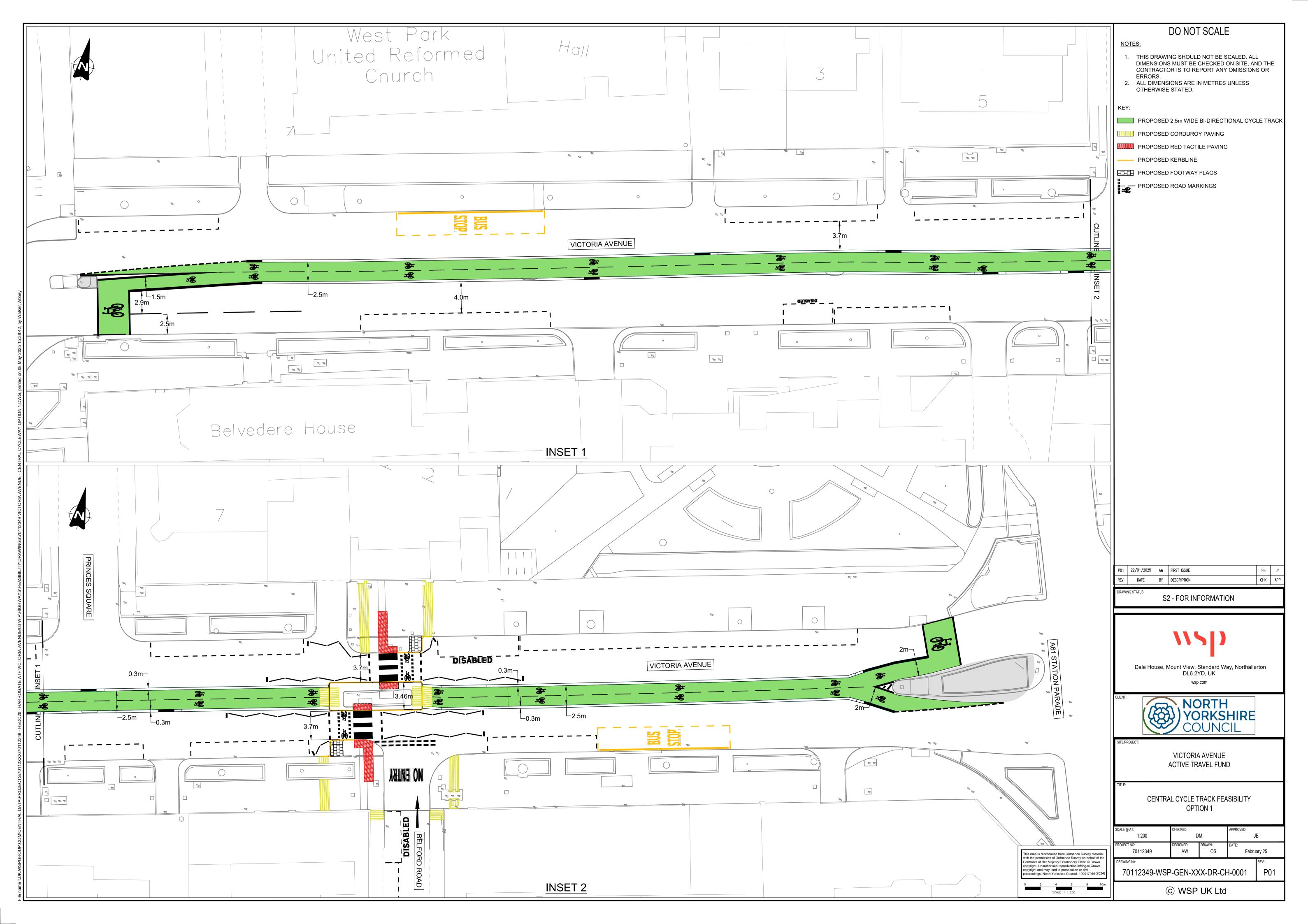


#### **5.0 RECOMMENDATIONS**

After thorough analysis and consideration of the proposed central bi-directional cycle track, it is recommended that the project does not progress due to the significant health and safety risks associated with the available options.

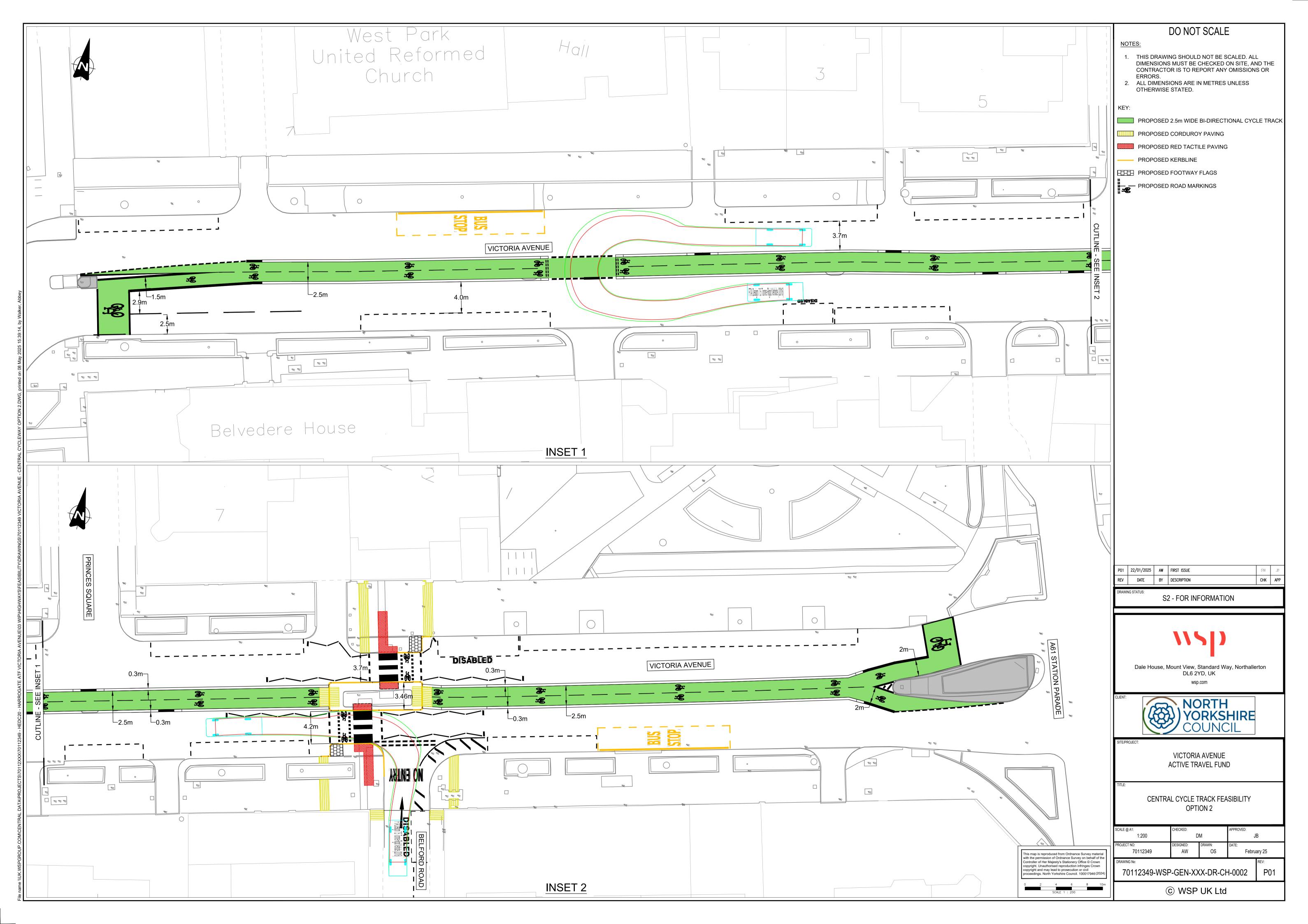
It is recommended that other options are explored to install cycle infrastructure along Victoria Avenue.





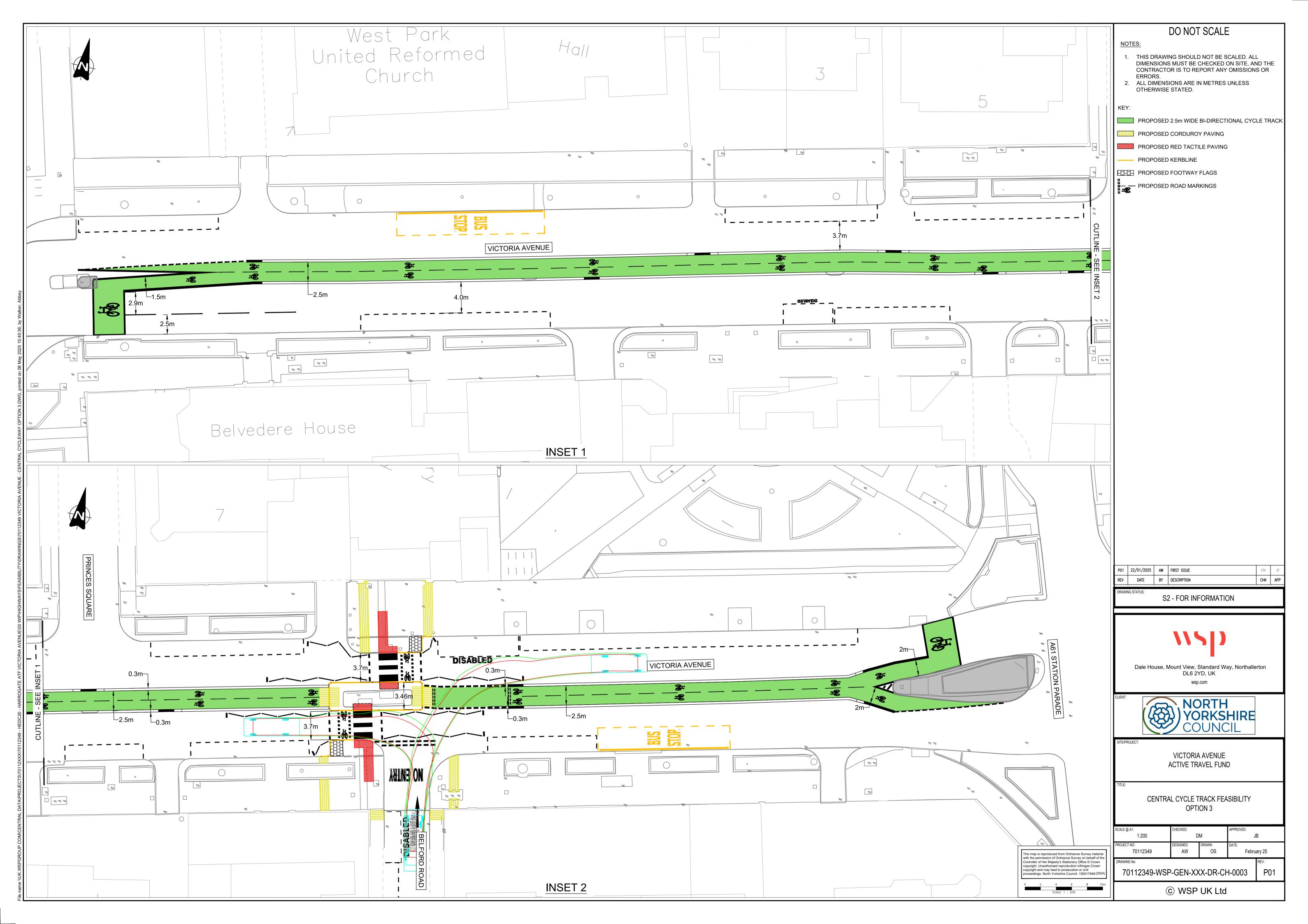


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