

Carterton to Oxford Railway Corridor

Salt Cross Garden Village Land Safeguarding

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1. Introduction and Aim

This technical note summarises the findings of the alignment study undertaken to establish the requirements for land safeguarding within the Salt Cross Garden Village (SCGV) development, in order to enable future construction of the Carterton to Oxford railway corridor.

This study builds on previous high-level work undertaken by SLC Rail for the wider Carterton to Oxford corridor, focusing specifically on the extents of the SCGV development (see Figure 1). The aim of this study is to establish the extent of land within SCGV that needs to be safeguarded for future construction of the railway corridor.

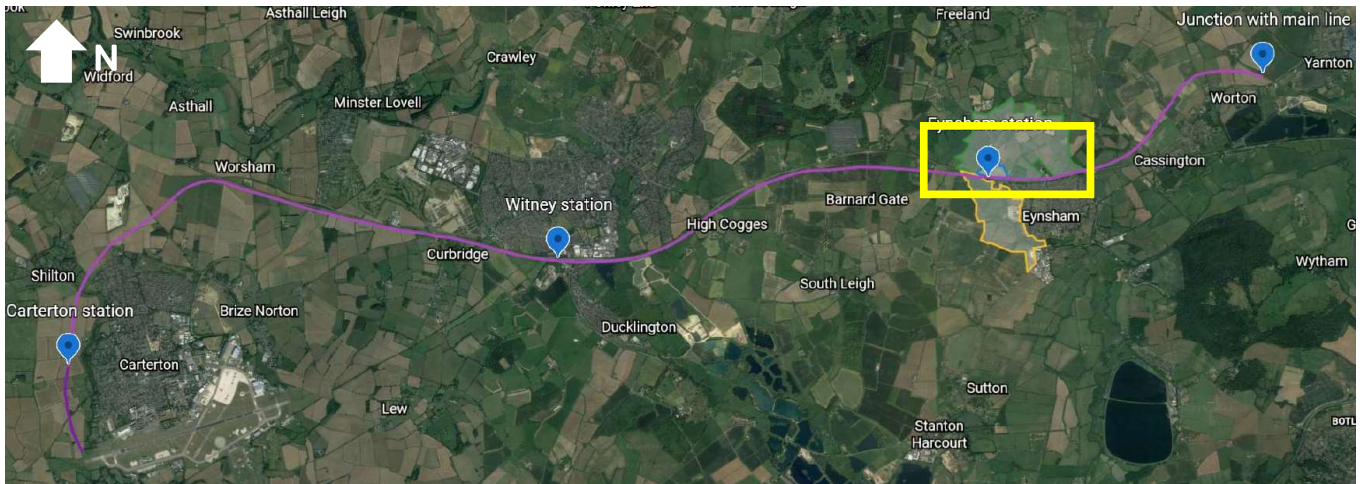


Figure 1 - Carterton to Oxford corridor (purple line) and extent of study (yellow box)

2. Key Assumptions

The following key assumptions have been made when undertaking the alignment study:

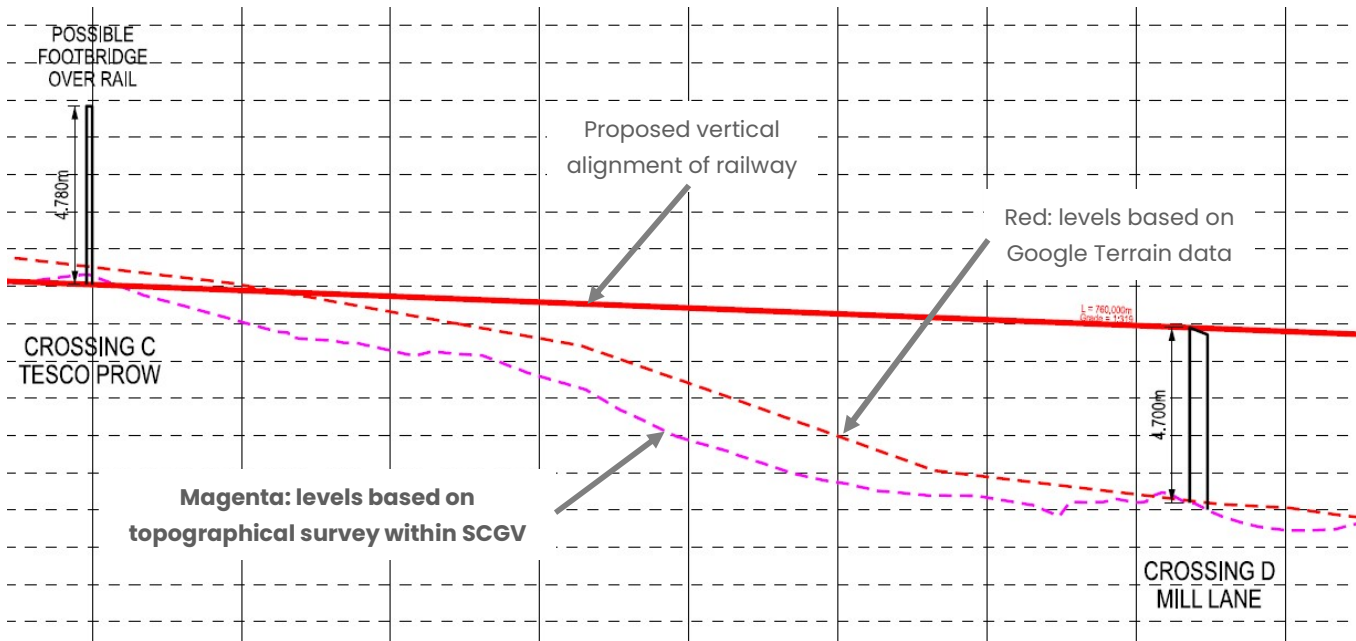
1. The study focused on the alignment between chainages CH3650 to CH5500 (i.e. within the boundaries of SCGV only), and all below assumptions and recommendations are to be read in conjunction with track alignment drawing 210918-CRL-ETR-DRG-00003_P01;
2. Vertical alignment has been optimised to reduce extents of earthworks or structures required;
3. Existing ground levels within extents of SCGV are based on topographical information provided by WOTG (file ref 32896_T_REV0, survey dated 25th February 2019). Where existing ground level data relating to railway corridor was not available (e.g. within the Millennium Wood area and around the existing Tesco site), the existing levels were interpolated using nearest available data points from same survey information;
4. Cuckoo Lane (Crossing A) was assumed to be closed with no railway level crossing required, i.e. railway corridor can cross at or near grade. In addition, four other vertical alignment constraint points (Crossings B through E) are to be considered in the revised alignment design (as per powerpoint file 'SCGV Plan, defining a rail route, master, 29Jun2022' provided by WOTG);
5. Assumed minimum required railway corridor width is 12.0m when at-grade (to accommodate two tracks and safe walking routes either side), shown in red line on drawing. There is an additional 2.0m assumed width either side of corridor where it is on a structure (viaduct, retaining wall), shown in green line on drawing;
6. Assumed all earthwork slopes can be graded at 1:3 (vertical:horizontal), shown in cyan line on drawing. No geotechnical review undertaken to confirm this assumption as part of this study;
7. A 10.0m wide construction corridor has been assumed either side of the proposed infrastructure works (shown in yellow line on drawing), this is a conservative assumption given the very early stages of the project and no contractor involvement. This is a 'desired' width and can be reduced locally if required (with implication of constructability and cost risk);
8. The following minimum vertical clearances have been provided at crossings:
 - a. Railway to cross on bridge over A40, minimum 6.80m above road (allowing for 5.30m clear headroom per DMRB CD 127 and NR/L3/CIV/020, plus 1.50m construction depth allowance);
 - b. Railway to cross Cuckoo Lane (Crossing A) at or close to grade (per assumption #3). If a pedestrian crossing, if required, could be achieved by constructing a footbridge over the railway with minimum 4.78m headroom (per NR/L3/TRK/2049). Alternatively, the horizontal alignment of Cuckoo Lane could be shifted further west (i.e. moved left on plan, to ~CH4950) and an underpass could be constructed under the railway, making use of existing topography (subject to alignment tie-ins being feasible);
 - c. Railway to cross Millennium Wood Public Right Of Way (PROW) (Crossing B) in shallow cutting, pedestrian crossing via footbridge over railway with minimum 4.78m headroom (per NR/L3/TRK/2049);
 - d. Railway to cross Tesco PROW (Crossing C) at grade, pedestrian crossing via footbridge over railway with minimum 4.78m headroom (per NR/L3/TRK/2049);
 - e. Railway to cross on bridge over Mill Lane (Crossing D), minimum 4.70m above bridleway (allowing for 3.40m clear headroom within underpass to DMRB CD 143 assuming equestrian use, plus 1.30m construction depth allowance);
 - f. Railway to cross on bridge over Lower Road (Crossing E), minimum 6.80m above road (allowing for 5.30m clear headroom per DMRB CD 127 and NR/L3/CIV/020, plus 1.50m construction depth allowance).

3. Track Alignment Drawing Commentary

The high-level track alignment drawing 210918-CRL-ETR-DRG-00003_P01 shows two separate existing ground level profiles due to two data sources being available for this study.

The dashed red line shows the existing ground levels based on Google Terrain data (extracted on 17/09/2021). This is the data used for the previous high-level work undertaken by SLC Rail for the whole Carterton to Oxford corridor study (therefore the red dotted line continues beyond the extents of the SCGV development). These levels are indicative only.

The dashed magenta line shows the existing ground levels based on the topographical information provided by WOTG (file ref 32896_T_REV0, survey dated 25th February 2019), and is available only within the boundaries of the SCGV development. This data was obtained by a topographical surveyor and is assumed to be more accurate than the Google Terrain data used for the wider corridor. Therefore, the alignment optimisation and determination of the extents of earthworks required was derived based on the topographical survey existing ground levels, where this was available (**i.e. the dashed magenta line takes precedence over the dashed red line, where available**).



Additionally, the below key is applicable to the horizontal alignment shown on the drawing:

- Proposed design alignment
- Second track shown indicatively (no alignment design undertaken)
- - - Indicative railway corridor outside of Salt Cross Garden Village development
- . - . Railway corridor on structure
- - - Railway corridor at grade
- . - . Railway corridor within cutting / embankment
- . - . Temporary land corridor for construction (width may be reduced locally)

4. Conclusions & Recommendations

The horizontal track alignment (from the previous corridor-wide work) was reviewed and deemed to be adequate through SCGV. The key horizontal constraints are related to the two crossings either end of SCGV (over A40 west, and over Lower Road east). The proposed alignment aims to minimise the length of structures required to cross the existing highways, whilst placing the railway corridor as close to the A40 corridor as possible, including allowance for a temporary construction corridor, and the interface with the A40 widening scheme. The proposed vertical track alignment, based on assumptions outlined above, is summarised in Table 1 below.

Chainage (CH)	Railway Corridor	Comment / Rationale
5500-5170	On structure (green line on drawing)	Existing ground levels fall to the west, but railway alignment constrained by having to cross over A40 at 6.80m headroom. Structure (viaduct / retaining wall) deemed best solution here to minimise the impact on Park & Ride.
5170-4890	At grade (red line on drawing)	Existing ground levels are close to proposed railway corridor levels, assumed the minor differences can be re-graded as part of Park & Ride scheme. Alternatively minor retaining structures can be constructed to overcome level differences. Assumed Crossing A (~CH4920) will be closed, and pedestrian connectivity (if required) will be via a new footbridge over the railway corridor. Alternatively, an underpass could be considered instead, subject to the re-alignment of Cuckoo Lane to cross the railway corridor further west (~CH4950). This would utilise the dip in the existing ground level profile at that location, however any re-alignment of Cuckoo Lane would need to consider existing constraints, such as the proximity to the A40 corridor and road accesses into properties north of the proposed railway corridor (into which any proposed re-alignment scheme would have to tie in on plan and in terms of vertical levels). Exploring the re-alignment of Cuckoo Lane is beyond the scope of this study and it is recommended that if this option is taken forward a feasibility study is commissioned for this work.
4890-4600	In cutting (cyan line on drawing)	Existing ground levels appear to be higher than proposed railway corridor levels (note this is based on interpolated points as no survey data was available within Millennium Wood). An earthworks solution (cutting) has been proposed to better blend into the surrounding wood landscape (compared to a structural solution e.g. retaining walls). Assumed Crossing B (~CH4640) will be via a new footbridge over the railway.
4600-4340	At grade (red line on drawing)	Existing ground levels close to proposed railway corridor levels, assuming minor level differences can be re-graded locally or mitigated by minor retaining structures. Assumed Crossing C (~CH4350) will be via a new footbridge over the railway.
4340-3650	On structure (green line on drawing) Alternative on	Existing ground levels fall to the east, but railway alignment constrained by having to cross over Crossings D and E (with 4.70m and 6.80m headroom, respectively). It is understood that housing may be proposed in proximity to this area, hence the preferred solution would be to place the railway corridor

	embankment (cyan line on drawing	on a structure (viaduct / retaining wall) to minimise land take requirements, however consideration needs to be given on the visual impact on the housing close to the viaduct. An earthworks solution has also been shown on the drawings to illustrate the alternative extents of the required land take. The earthworks solution might appear softer in terms of landscaping and provide a barrier between the development and the A40 corridor, possibly reducing the noise and visual impacts of the A40 corridor on the development. The earthworks solution will likely be more cost effective to construct compared to a structure. A range of hybrid solutions is also possible, where the railway is supported on an embankment with retaining structures at the toe (bottom end) of the embankment. This will enable reducing the amount of land take required and could be a viable solution on the northern side of the railway corridor. Should the railway corridor scheme be progressed further, a feasibility study will be required to further explore the possible options of earth retention and to verify these assumptions.
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In conclusion, if it is decided that there is a need to safeguard the future provision of the Carterton to Oxford corridor, the route highlighted on track alignment drawing 210918-CRL-ETR-DRG-00003_P01 is the land through the SCGV development that will be required to be protected.

Appendix A – Track Alignment Drawing

Drawing 210918-CRL-ETR-DRG-00003_P01 submitted separately due to file size.