

Alignment Options for Cross Island Line (CRL)

The LTA has studied two underground alignments in the vicinity of the Central Catchment Nature Reserve (CCNR) to decide on the option that best serves the public. To allow the Government to make an informed decision on the final alignment of the CRL, LTA commissioned in 2014 an Environmental Impact Assessment (EIA) for both underground alignment options, which consists of a comprehensive two-phased EIA process.

The EIA findings were carefully reviewed in tandem with broader socio-economic considerations such as transport connectivity, travel times, costs, and impact on homeowners and commuters.

The Phase 2 EIA looked at the potential impact of the construction and operations of the CRL, and was conducted based on a robust set of engineering schemes independently reviewed by an International Panel of Advisors. The direct alignment option was concluded to be feasible based on the EIA, with any residual environmental impact manageable if appropriate mitigation measures were put in place.



Above: Direct (blue line) and Skirting (pink line) alignment options. CCNR boundary marked by black line

	Direct alignment option	Skirting alignment option
Infographic	<p>Direct Alignment: Deep Depth of Tunnel under Central Catchment Nature Reserve (CCNR)</p> <p>No surface works within the CCNR</p> <p>25 storeys HDB Block</p> <p>Topsoil Residual Soil Weathered Soil Granite Bedrock</p> <p>Tunnelling will be carried out deep below CCNR and there will be no construction on the surface.</p> <p>Tunnels will be built to a small extent only below average ground level.</p> <p>Longitudinal profile along direct alignment</p> <p>CCNR, Bukit Golf Course, CCNR, Bukit Golf Course, Ground Level, Soil, CRL Tunnel, Rock</p>	<p>Skirting Alignment: Tunnels Minimise Impact on Existing Buildings and Underground Infrastructure</p> <p>Topsoil Residual Soil Weathered Soil Granite Bedrock</p> <p>CCL Tunnels TEL Tunnels CRL Tunnels Cable Tunnel</p> <p>For illustrative purposes only. Actual tunnel depth and positioning vary at different locations.</p> <p>Longitudinal profile along skirting alignment</p> <p>CCL Tunnel, Rock</p>
Tunnel length	4km, with 2km tunnelling underneath the CCNR	9km
Tunnel depth	Approximately 70m below average ground level, which is equivalent to the height of a 25-storey HDB block, and within hard granite rock. No surface works within the CCNR.	Approximately 45m deep to ensure that tunnelling will be safe for aboveground buildings and away from existing underground infrastructure
Construction cost	Lower construction cost	Cost an additional \$2 billion to construct
Difference in travel time (between any two CRL stations on either sides of the CCNR)	About 6 minutes less under the direct alignment (examples below)	
Difference in commuter fare	About 15% less per trip on average under the direct alignment	
Projected ridership across the whole CRL	Estimated daily ridership of more than 600,000 across the whole CRL in the initial years, and over one million in the longer term, under the direct alignment. This will be lower under the skirting alignment as some commuters are expected to remain on the existing lines.	
Examples of estimated travel time		
	Direct alignment option	Skirting alignment option
Pasir Ris to Jurong area ¹		
Time (per trip)	55min	61min
Ang Mo Kio to Clementi area ³		
Time (per trip)	32min	38min

¹ Travel times are estimated and subject to the final alignment and station locations after detailed design studies.

Two-Phased EIA Process

Phase 1 evaluated the existing ecosystem and physical conditions of the CCNR as well as the environmental impact of site investigation (SI) works within the CCNR. The findings of the SI works were used to provide inputs for Phase 2 of the EIA. The Phase 1 Report was published on February 2016 for public feedback.

Phase 2 focused on the potential environmental impact of the construction and operations of the CRL as well as the required mitigation measures. LTA sought inputs from, and engaged with, the relevant stakeholders as part of this process. The Phase 2 Report was published on September 2019 for public feedback.