

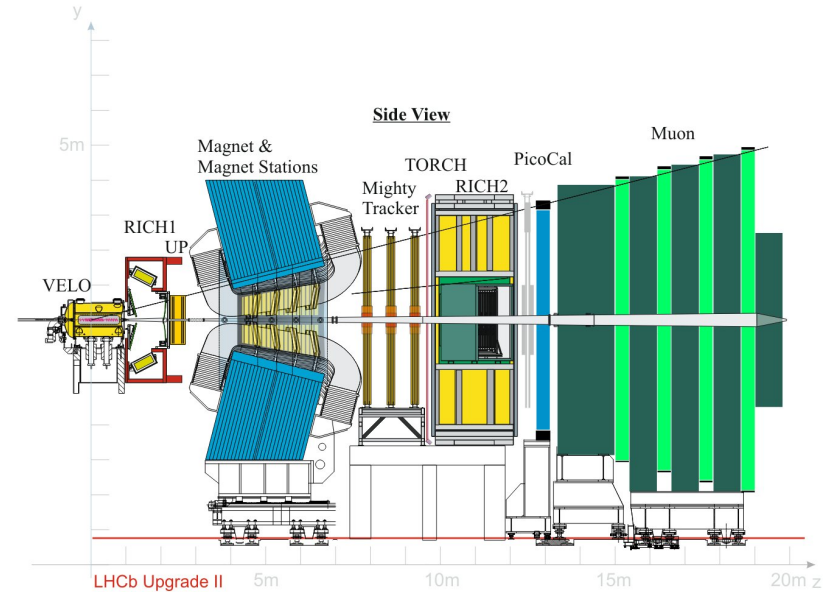
LHCb Upgrade



General & Timescales



- Current Status summarized here:
 - <https://cds.cern.ch/record/2903094/files/LHCB-TDR-026.pdf>
- Timescale
 - TDR 2026
 - Construction 2027-2032
 - Installation 2034/35
 - Data taking 2036



Scenarios



- Three scenarios
 - Difference both on detector coverage/reduancy and ultimate luminosity
 - Minor performance impact moving from Baseline to Middle

Table 6: Cost estimates for the LHCb Upgrade II detector Baseline, Middle and Low scenarios. The peak luminosity is also reported for each scenario.

	Baseline	Middle	Low
$\mathcal{L}_{\text{peak}}$ ($10^{34} \text{ cm}^{-2} \text{ s}^{-1}$)	1.5	1.0	1.0
	(kCHF)	(kCHF)	(kCHF)
VELO	16672	15906	13753
UP	8077	7719	6887
Magnet Stations	2592	2234	0
Mighty-SciFi	21767	21273	17388
Mighty-Pixel	15994	11641	11061
RICH	21450	18415	14794
TORCH	12508	8756	0
PicoCal	27607	27607	21584
Muon	9785	8266	8266
RTA	18800	11700	9500
Online	11800	9467	8993
Infrastructure	14463	13284	12430
Total	181515	156268	124656

Lots of Silicon

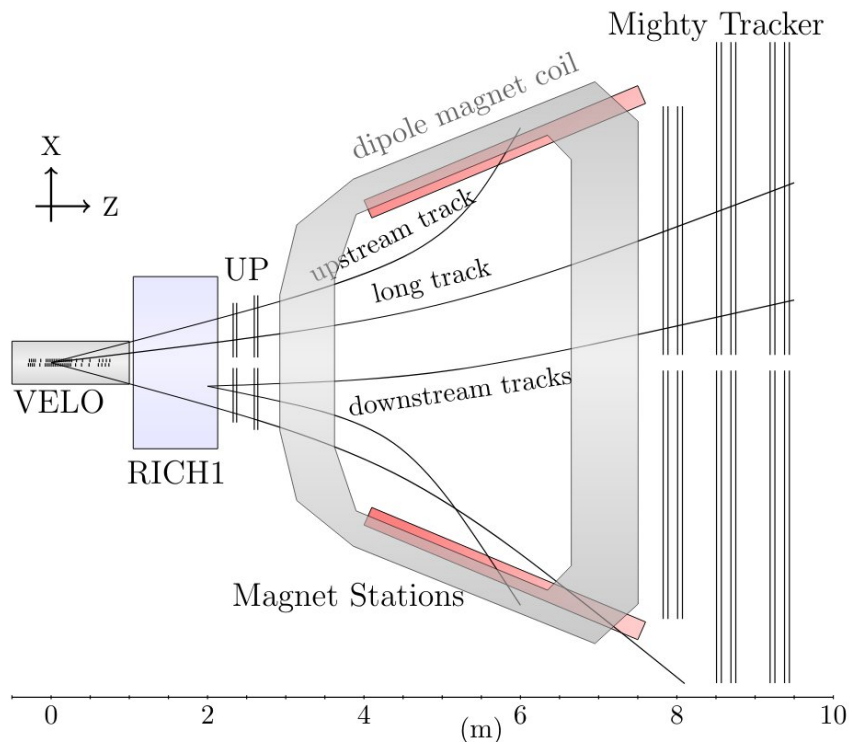


Table 7: Summary of tracking detector scenarios.

Baseline	Middle	Low
$1.5 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$	$1.0 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$	$1.0 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$
VELO		
32 stations, $\eta < 4.8$	32 stations, $\eta < 4.8$	28 stations, $\eta < 4.7$
module 0.8% X_0	module 0.8% X_0	module 1.6% X_0
RF foil 75 μm	RF foil 75 μm	RF foil 150 μm
UP		
4 planes pixel $\times 1.7 \text{ m}^2$	as baseline	remove corners
Magnet Stations		
4 panels fibres $\times 3.5 \text{ m}^2$	as baseline	remove
Mighty-Pixel		
6 planes pixel $\times 2.1 \text{ m}^2$	6 planes pixel $\times 1.3 \text{ m}^2$	6 planes pixel $\times 1.3 \text{ m}^2$
Mighty-SciFi		
12 planes fibres	12 planes fibres	12 planes fibres
25.9 m^2/plane	shorter, 23.7 m^2/plane	narrower, 18.9 m^2/plane

Opportunities & Risks



- Likelihood to happen
 - Reasonably high
- Strong German Participation already
 - Aachen, Bochum, Bonn, Heidelberg, KIT
 - National Hub role
- Big silicon detectors ideally suited for the DAF
 - and MightyPix is closely related to TelePix
- Yet another CERN/LHC experiment
 - Again tied to LHC schedule
- We could be coming too late
 - Overall problem
 - Given the upgrade scope I think we'd be welcome
- Physics programme has big overlaps with Belle
 - This then also depends on SuperKEKb performance