



# Engineering, machine interface & facility issues

Self evidently, all possible applications of the tunnel & caverns should be taken into account in their design and that of the supporting surface facilities

Important right now to make a reasonable baseline with estimates of the uncertainties in this baseline (due to lack of knowledge, undecided technical specs, etc)

...and also the evolutions conceivable over the lifetime of the FCC facility (maybe 50 years!)

For the p-p collider, choosing baseline specs as close as possible to HL-LHC (apart from Ecm of course) will simplify convergence on, and study of, many issue of expt design, but extent of possible variation of starting configuration about this baseline must be thought about carefully . Examples are parameters such as

- bunch structure

- abort system (dump locations, abort gap etc)

- luminosity

  - (rates, shielding, activation, maintenance scenarios & strategies)



## Eg site facility issues

Surface facilities location to allow access of heavy, outsize and unusual loads  
direct delivery of large components to site  
much more capable initial site infrastructure than at LHC?  
detector services completed early and available for surface testing  
(possible surface partial or total pre-assembly)

Size of caverns for GP expts: important input to CE and cost analysis  
probably determined by :

- the magnetic bending solutions for the momentum measurement reach required  
the objectives and thus detector configuration in the forward region

- $l * (\text{distance ip to 1'st machine element})$

- TAS or similar dual purpose protection elements

- Beampipe vacuum system

- Number and size of access shafts

- Service infrastructure (assume parallel expt and service caverns for all expts?)

  - try to minimise amount of infrastructure underground cf LHC

and last but not least, Cost ( but let's not restrict the future for small % of total FCC budget)