Landscape/Goals for R&D

- Goal: Barrel+structure ready Summer/Fall 06 (run07)
- Goal: Endcaps ready Summer/Fall 07 (run08)

- RIKEN funds available 03, 04, 05
- DOE construction funds
  - goal is FY05

R&D

Much ongoing effort, supported by

- RIKEN, LANL LDRD, ISU university funds, SUNY-SB funds

R&D Priorities (FY03/FY04)

- pixel pilot and signal bus
- generic Si FEM (pixel, strip, endcap)
- strip/SVX4 readout
- ministrip PHX

Later FY04 (when device better specified)

- mechanical support/cooling

Si Strip Electronics

- (PHX + ministrip),
  - DOE funds FY03+FY04
  - 1st round design finished by April-Jul ’04
  - tested by Dec ’04
- (SVX4 + strip) system test, starts Sep ’03
  - two options for 1st round of readout card
    - » RIKEN funds+DOE R&D funds early FY04
      - keeps on schedule
    - » or wait till we decide between SVX4 and PHX
- Propose to group
  - make decision on which strip technology April ’04
  - limited knowledge of PHX by then, so if PHX is the decision
    - » fall-back is SVX4

R&D Funds: Proposal

Item	JY03	JY04	FY03 BNL	FY03 DOE	FY04 DOE	FY05 DOE
Pixel Pilot	50	50	15		90	45
Pixel Bus	50	50				
Pixel FEM/DCM			15		90	45
Strip sensors	60					
Strip ROC+FEM *	300	100			125	
mini-strip ROC				80	125	140
mini-strip sensors					15	15
mini-strip pilot/assembly						100
mechanical/cooling					200	150
overhead			4	?	208	146
Total	460	200	34	80	853	641

*Strip ROC, contingent on decision, total is $300K less than needed

Backup

PHX Schedule

- Design specifications completed 10/03
- Start design 12/03
- Submit prototype 7/04
- Prototype testing completed 12/04
- Redesign completed for engineering run 1/05
- Engineering run back 3/05

PHX Cost

- Chip design/testing – 2 man-years - $275K (includes all overhead costs)
- Prototype chip fabrication- $40K (small chip)
- Test board $5K
- Engineering run (10-12 wafers) $200K

20 wafers total

- 9 Extra wafers using same masks - $45K
- Production wafer level testing –engineering, tech time, circuit board, probe card - $60K
- Contingency tbd

  FY03-FY04 = 182K, FY04 =

Physics of Strip Decision

- Occupancy
  - BNL strips 2nd layer ~ 10%, mini-strips much less
  - "10%" needs to be checked (volunteer?)
  - ramifications
    - » with projective geometry, 3-D hit is ambiguous
      - stand-alone tracking difficult, but not the main plan
    - » projections from outer detectors (e.g. dch)
      - more than one hit may associate with same track
      - DCA ambiguous
      - envelope calculation ? or requires tracking team ?
- 3-D position information better with mini-strips
  - high-pt track rejection?
  - use with endcap?
- Heat-load different => thickness? (volunteer?)

Other issues

- ambiguity may be a concern for proposals/reviewers
  - unlikely to affect CD0?
  - need to work on costs, WBS
  - need mini-strip sensor expert (volunteer?)