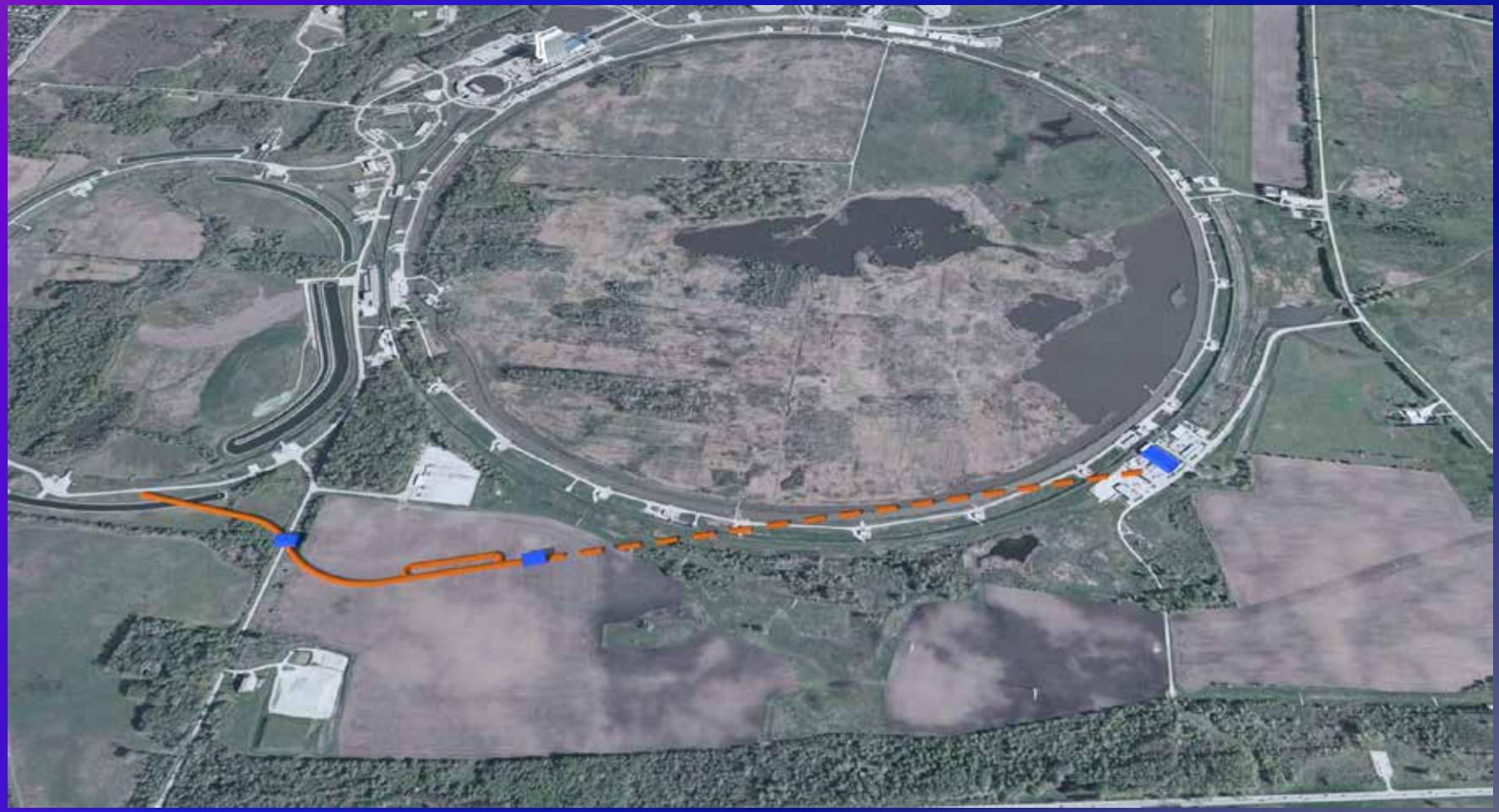
Project Considerations

Back to Earth

Siting Concept



Steve Dixon (Fermilab FESS) will discuss tomorrow

Preliminary Cost Estimate

- Major Components
  - Beamline, Target Station & Horn
  - Transport line
  - Decay ring
  - Detectors (Far & Near)
  - Project Office
  - Total

$30M
9
54
18
15
$126M

- Basis of Estimation (BOE)
  - Took existing facilities (MiniBooNE beam line and target station, MINOS detector, vetted magnet costing models, m2e civil construction costs, EuroNu detector costing, have added all cost loading factors and have escalated to 2012 $ when necessary.

Costing Details

Beamline & Target Station

- Based on MiniBooNE
  - Horn & PS, misc electrical equipment $6.0M
  - Instrumentation .5
  - Civil (~ 2XMiniBooNE) 6.3
  - Beam line 1.5
  - Total $14.3
- Escalating factors
  - 1.5 – to include fully loaded SWF
  - 1.35 – in 2012 $
- Total: $30M

Decay Ring

Ø Magnets (Used Strauss & Green Costing Model) – V. Kashikhin

nuStorm Superconducting Magnets cost estimation June 14, 2012											
		Pole field	Length	Aperture	Quantity	Gradient	Magnet Cost*	Total cost		3.142	Cryo
Name	Type	Bp, T	Lm, m	Da, m	Qty	G, T/m	C, M$	Total C, M$			Cr,M$
D1	Dipole	3.9	0.85	0.3	24	0	0.4787	11.488			1.56
Q1	Quadrupole	3.8	0.5	0.3	30	6.33	0.2070	6.210			1.95
Q2	Quadrupole	1.6	0.6	0.3	33	2.67	0.1295	4.273			2.145
Q3	Quadrupole	0.4	0.6	0.3	63	0.67	0.0526	3.313			4.095
					150			25.3	M$		9.8
* - magnet cost calculated using the magnetic field energy volume where Lm is the magnet length											

Decay Ring – Estimate II

Ø From Alex Bogacz (ring designer)

19 June 2012 – KBB
May 15 13:20 Ring_new.opt

qty	name	Lcm	aperture	Bkgcm[i]	Bkgcm[i]	width[cm]	height[cm]	radius[cm]	storedenergy[MJ]	cost/ea	cost/type
24	dAin	85	15	38.9138	0	15	15		0.1184	$30,804	$739,303
4	qD1	50	15	0	-2.68838			15	0.1143	$290,562	$1,162,249
4	qD2	50	15	0	-2.56058			15	0.1037	$263,594	$1,054,374
4	qD3	50	15	0	-2.43127			15	0.0935	$237,643	$950,571
2	qD4	50	15	0	-2.45204			15	0.0951	$241,720	$483,441
12	qDD	60	30	0	-0.108			30	0.0035	$9,003	$108,041
2	qDDa	30	30	0	-0.108			30	0.0018	$4,502	$9,003
28	qDS	60	15	0	-1.086			15	0.0224	$56,898	$1,593,151
4	qF1	50	15	0	2.38574			15	0.0900	$228,825	$915,302
4	qF2	50	15	0	2.48112			15	0.0974	$247,488	$989,951
4	qF3	50	15	0	2.57227			15	0.1047	$266,006	$1,064,023
4	qF4	50	15	0	2.53313			15	0.1015	$257,972	$1,031,889
12	qFD	60	30	0	0.108			30	0.0035	$9,003	$108,041
36	qFS	60	15	0	1.086			15	0.0224	$56,898	$2,048,337
2	qFSa	30	15	0	1.086			15	0.0112	$28,449	$56,898
2	qMD1	50	15	0	-0.804088			15	0.0102	$25,994	$51,987
2	qMD2	50	15	0	1.10154			15	0.0192	$48,782	$97,564
2	qMD3	50	15	0	-0.76149			15	0.0092	$23,312	$46,625
2	qMD4	50	15	0	0.354415			15	0.0020	$5,050	$10,100
2	qMS1	50	15	0	-2.05816			15	0.0670	$170,301	$340,601
2	qMS2	50	15	0	1.87905			15	0.0559	$141,950	$283,900
2	qMS3	50	15	0	-1.61757			15	0.0414	$105,192	$210,385
2	qMS4	50	15	0	1.41665			15	0.0317	$80,683	$161,366
											$13,517,101.53

Decay Ring

- Used bigger number for magnets

- PS & Instrumentation - $1M
- Vacuum - $2M
- Civil - $15.7M
  - Based on m2e tunnel costs (&depth) ($9.5k/foot) times 1.5 to fully load, EDIA…

- Total: 53.8M
- Note: Transport line costed at 17% (by length) of DR - $9M

Estimate effort to produce full proposal

Table X. Estimated effort to produce full proposal

Task	ΣFTE
Target Station	0.75
Capture & transport	1.25
Injection	0.25
Decay ring	2
Far Detector (Engineering)	1
Far Detector (Sim & Analysis)	2
Near Detector (Engineering)	1
Near Detector (Sim & Analysis)[a]	3.5
Costing	1
Total	**12.75**