Injector Configuration Check Off

- S-Band Drive and PreLinacs (i.e. no C-Band)
- 120 Hz Operation (no 180 Hz DRs)
- 3x4 Positron Target System (needs beam line development)
- Foreshortened PreLinac Collimation Regions (165m ⇒ 75m length, x2)
- No CLIC-style Two-Beam Injector Development
- Two Layout Options: Separate e- and e+ complexes located in dedicated housings at the upstream ends of the respective main linac housings; Dual level, common injector housing (e.g. Fermilab site) (needs transport line development and revisit to e- MDR injection/extraction layout for e- Bent Back scenario)
Injectors Configuration Check Off, Additional Work

- Continued 180 Hz Damping Ring Design Effort
- Continued Investigations into the Feasibility of Polarized Positrons
### Injector Configuration Option Costs

<table>
<thead>
<tr>
<th>Layout</th>
<th>Cost wrt CD06 Baseline ($M)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 0</td>
<td>0</td>
<td>CD06 Baseline, estimate $700M total: beamlines, tunnels, utilities</td>
</tr>
<tr>
<td>Step 0'</td>
<td>-22.2</td>
<td>e+ Bent Back</td>
</tr>
<tr>
<td>Step 0''</td>
<td>-29.1</td>
<td>e+,e- Bent Back</td>
</tr>
<tr>
<td>Step 1'</td>
<td>-25.7</td>
<td>e+ BB in Main Linac Tunnel</td>
</tr>
<tr>
<td>Step 1''</td>
<td>-28.7</td>
<td>e+,e- BB in ML Tunnel</td>
</tr>
<tr>
<td>Step 2'</td>
<td>10.2</td>
<td>e+BB, MLT, Long Transport Line</td>
</tr>
<tr>
<td>Step 2''</td>
<td>6.8</td>
<td>e+,e-BB, MLT, LTL</td>
</tr>
<tr>
<td>Step 3</td>
<td>26.5</td>
<td>e+BB, Common Injector Tunnel, near surface ML, LTL</td>
</tr>
<tr>
<td>Step 3'</td>
<td>37.1</td>
<td>e+BB, Common Injector Tunnel, deep ML, LTL</td>
</tr>
<tr>
<td>Step 4</td>
<td>46</td>
<td>Full T, CIT, nsML, LTL</td>
</tr>
<tr>
<td>Step 5</td>
<td>19.5</td>
<td>Step 4 minus 1 Prelinac + 10 us rf</td>
</tr>
<tr>
<td>Step 6</td>
<td>-13.6</td>
<td>Basic Central Injector, nsML, LTL, 15 us rf</td>
</tr>
<tr>
<td>Option A</td>
<td>29.5</td>
<td>Pair of near surface to 100 m down vertical transport lines add on to 4, 5, or 6</td>
</tr>
<tr>
<td>Option B</td>
<td>18.9</td>
<td>Pair of 197 m reverse bends</td>
</tr>
</tbody>
</table>

- Recommended CA near surface layout
- Recommended Fermilab deep tunnel site
- Least expensive Fermilab deep tunnel option
- Provides separated e- and e+ production
E Injector SystemCD0.6, Baseline. Rev 2

Step 0, 01/025/01

Updated 1/11/01

Figure 1
**E- Injector System CD0.6, Baseline. Rev 2**

Step 0, 01/025/01

---

### E+ Injector System CD0.6, Baseline. Rev 2

- **E+ Targets**
- **E+ Main Linac**
- **E+ Pre-Linac**
- **E+ PDR LTR**
- **E+ BSTR**
- **E+ MDR**
- **E+ Pre-Coll**
- **E+ BC-1**
- **E+ BC-2**
- **E- Drive Linac**
- **E- SCRS**

---

**Dimensions:**
- 339m
- 507m
- 536m
- 433m

**E+ Main Linac**:
- 448m
- **S-Band (6 GeV)**
- **Chicane**
- **X-Band 0.6 GeV**

**E+ BC-2**:
- **X-Band 0.6 GeV**

**E+ Pre-Coll**:
- 75m

---

**E- SCRS**

---

**Additional Notes:**
- Step 0, 01/025/01
- R 52
- BC-2 Arc
Linearly multiplexed multiple-positron-target scheme

6 – 8 GeV $e^{-}$ in $\rightarrow$ 250 MeV $e^{+}$ out

Needs optics layout
Needs access shafts
Needs target disposal pit (tbd)
Config 3, E- Injector CD0.6, Bent Back- Step 0''

Step 0’’, 01/025/01

Figure 5

Updated 1/24/01
Config 3, E+ Injector, Bent Back, Step 0', CD0.6

Step 0'', 01/25/01

Figure 4
Figure 3

Updated 1/23/01
E+ Injector, Bent Back, Linear e+ Targets, Combined DRs

Step 1’ and 1’’, 01/025/01

Figure 4
Common Tunnel, Avoid Beam Delivery
CD0.6 Linear e+ Targets

Step 2, 01/025/01

Figure 5
Combined Injector, Near Surface CD0.6

Step 3, 01/025/01

1059m

Figure 6
Figure 8
Config 11, Combined THj., 1 Pre-Linac, CD0.6

Step 5, 01/025/01

Figure 8
Figure 9