From the Roman Pot to the cable tray: L1=3mt
L2 = Machine Tunnel + By Pass tunnel = distance from IP + 5mt
From By pass tunnel to Racks in USC : L3 = 15mt
Length of trigger cables \( L_{tr} = L_1 + L_2 + L_3 \)

Roman Pot 1: Z position from IP = 112mt
\[
L_{tr} = 3\text{mt} + (112+5)\text{mt} + 15\text{mt} = 135\text{mt}
\]

Roman Pot 2: Z position from IP = 150mt
\[
L_{tr} = 3\text{mt} + (150+5)\text{mt} + 15\text{mt} = 173\text{mt}
\]

Roman Pot 3: Z position from IP = 182mt
\[
L_{tr} = 3\text{mt} + (182+5)\text{mt} + 15\text{mt} = 205\text{mt}
\]

Roman Pot 4: Z position from IP = 215mt
\[
L_{tr} = 3\text{mt} + (215+5)\text{mt} + 15\text{mt} = 238\text{mt}
\]
# Latency Budget

<table>
<thead>
<tr>
<th></th>
<th>Roman Pot 1 $Z = 112\text{mt}$</th>
<th>Roman Pot 2 $Z = 150\text{mt}$</th>
<th>Roman Pot 3 $Z = 182\text{mt}$</th>
<th>Roman Pot 4 $Z = 215\text{mt}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of flight</td>
<td>15bx</td>
<td>20bx</td>
<td>25bx</td>
<td>29bx</td>
</tr>
<tr>
<td>Propagation Time</td>
<td>1bx</td>
<td>1bx</td>
<td>1bx</td>
<td>1bx</td>
</tr>
<tr>
<td>Trigger Primitive Generation</td>
<td>5bx</td>
<td>5bx</td>
<td>5bx</td>
<td>5bx</td>
</tr>
<tr>
<td>Cable Runs to the counting Room $^*$</td>
<td>26bx (135mt)</td>
<td>35bx (173mt)</td>
<td>43bx (205mt)</td>
<td>50bx (238mt)</td>
</tr>
<tr>
<td>Global Trigger</td>
<td>10bx</td>
<td>10bx</td>
<td>10bx</td>
<td>10bx</td>
</tr>
<tr>
<td>Timing, Trigger &amp; Control</td>
<td>5bx</td>
<td>5bx</td>
<td>5bx</td>
<td>5bx</td>
</tr>
<tr>
<td>Cable Runs Back $^*$</td>
<td>26bx (135mt)</td>
<td>35bx (173mt)</td>
<td>43bx (205mt)</td>
<td>50bx (238mt)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>88bx</td>
<td>111bx</td>
<td>132bx</td>
<td>150bx</td>
</tr>
</tbody>
</table>

$^*$Optical Fiber delay, 5ns/m

1bx = 25ns

M. Oriunno
Feb. 2002
Latency Budget

Counting Room
- Global Trigger (10bx)
- TTC (5bx)

RP1  88bx
RP2  111bx
RP3  132bx
RP4  150bx

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Feb. 2002
50bx
26bx
43bx
35bx
47bx
61bx
74bx
85bx
CMS as sub-detector in TOTEM

TOTEM Trigger

Regional Trigger (Muon, Calo)

Level 1 Trigger

Global Trigger

Timing, Trigger & Control

Readout

$\tau_{\text{TOTEM}} < \tau_{\text{CMS}} = 99\,\text{bx} \ (2.5\,\mu\text{s})$

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TOTEM as sub-detector in CMS

Regional Trigger (Muon, Calo)

Global Trigger

Level 1 Trigger

Timing, Trigger & Control

$t_{\text{TOTEM}} + t_{\text{ttc TOTEM}} = t_{\text{CMS}} + t_{\text{ttc CMS}} = 128\text{bx (3.2µs)}$