

Course Measurement Data Sheet
The Electronic Distance Meter Method for Extremely Straight Courses

1. Name this Course will be Known By: **Mid-Town 2 km Race Walk**
2. Is this course extremely straight? **Yes – only 1 jog in the path of 7.5m just past course center**
3. What are we trying to measure?
 - 3.1. **A 2 km loop on a straight, east-west, bike path with the start/finish located in the exact center of the course.**
4. Methodology
 - 4.1. Determine how much of the course is covered by the turnaround
 - 4.1.1. Determine the radius of the turnaround: **1.91m**
 - 4.1.2. Compute the distance covered on the turnaround semi-circle: **6.00m**
 - 4.2. Locate & Mark the course mid-point
 - 4.2.1. **Middle of middle north-south beam of 13th Street overpass**
 - 4.2.2. **Marked with a pk-nail on the center-line of the bike path**
 - 4.3. Setup EDM over mid-point
 - 4.4. Measure a 1km out-and-back course on each side of the mid-point
 - 4.4.1. Compute the distance to the center of the turnaround semi-circle from the course mid-point
 - 4.4.1.1. Distance $(1000\text{m}-6\text{m})/2 = \mathbf{497\text{m}}$
 - 4.4.2. Locate the center of the turnaround semi-circle
 - 4.4.2.1. Measure to nearby the center – can't place the reflector in middle of the bike path
 - 4.4.2.1.1. Measured distance East: **496.82m** West: **496.87m**
 - 4.4.2.1.2. Offset from course centerline East: **5.6m south** West: **8.6m north**
 - 4.4.2.2. Project onto course centerline
 - 4.4.2.2.1. Formula $\text{sqrt}(\text{measured distance} * \text{measured distance} - \text{offset} * \text{offset})$
 - 4.4.2.2.2. Projected distance East: 496.79m West: 496.80m
 - 4.4.2.3. Compute the distance to adjust the measurement
 - 4.4.2.3.1. Formula Distance – Projected distance
 - 4.4.2.3.2. Adjustment East: **0.21m east** West: **0.20m west**
 - 4.4.2.4. Compute a “protection against short course” safety factor
 - 4.4.2.4.1. East is straight as an arrow – **add 0.5m**
 - 4.4.2.4.2. West has slight jog near the course mid-point
 - 4.4.2.4.2.1. Measure from course mid-point to past jog along course centerline **75m**
 - 4.4.2.4.2.2. Measure with surveyors wheel shortest path along cone restricted route **75.5m**
 - 4.4.2.4.2.3. Use “jog” as the safety factor on West
 - 4.4.2.5. Adjust Measure & Mark the turnaround center
 - 4.4.2.5.1. Adjust Measure East: **0.71m further east** West: **0.20m further west**
 - 4.4.2.5.2. Mark with pk nail in the center of the bike path
 - 4.4.2.5.2.1. Center of turnaround **as indicated in 4.4.2.5.1**
 - 4.4.2.5.2.2. Radius of turnaround East: **1.91m further east** West: **1.91m further west**
 5. Course Parameters
 - 5.1. Course Distance: **2,002m (including short course safety factor)**
 - 5.2. Course Distance on each side of start/finish line: **1,001m**
 - 5.3. Shape of the turnarounds: **semi-circle**
 - 5.4. Radius of both turnarounds: **1.91m radius**
 - 5.5. Distance around the semi-circle: **6m**
 - 5.6. Distance from a turnaround center to start/finish line: $(1,001\text{m}-6\text{m})/2 = \mathbf{497.5\text{m}}$