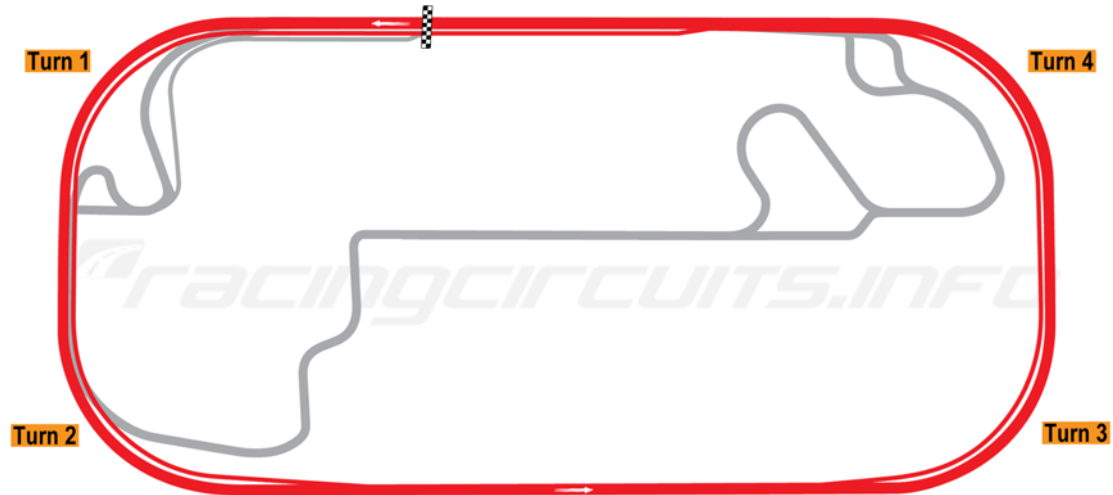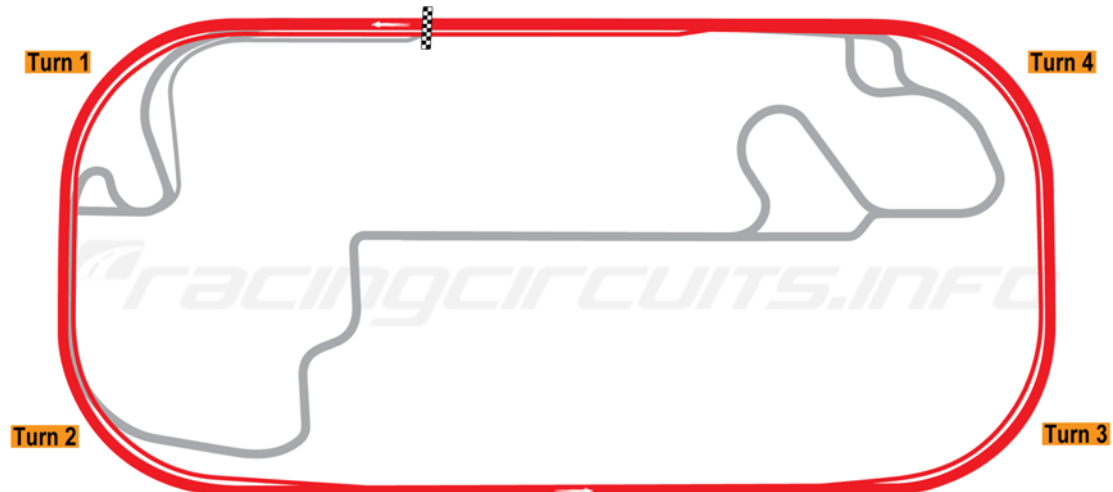# Indy 500 Racetrack

The Indianapolis Motor Speedway oval has two 1000 metre straights, two 226 metre straights and four identical turns with radius of curvature 250 metres.
Find the total length of the racetrack, giving your answer to the nearest metre.

Assuming the average speed on straights is 100 metres per second (around 220 mph), and the average speed on turns is 20% less, how long should one complete lap take, in seconds?
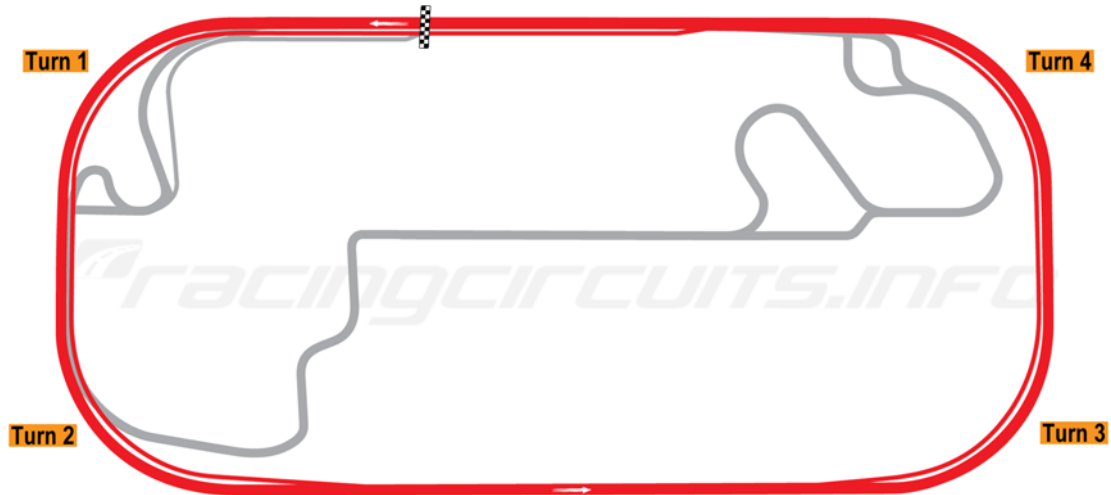
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Indy 500 Racetrack **SOLUTIONS**

The Indianapolis Motor Speedway oval has two 1000 metre straights, two 226 metre straights and four identical turns with radius of curvature 250 metres. **Find the total length of the racetrack, giving your answer to the nearest metre.**

Two long straights plus two short straights:
$$1000 + 1000 + 226 + 226 = \boldsymbol{2452m}$$

Four arcs, each one forming a quarter circle, is equivalent to one full circle:
$$2\pi r = 2 \times \pi \times 250 = 500\pi \approx \boldsymbol{1571m}$$

Total distance: $2452 + 1571 = \boldsymbol{4023m}$

Assuming the average speed on straights is 100 metres per second (around 220 mph), and the average speed on turns is 20% less, how long should one complete lap take, in seconds?

$2452m$ at a speed of $100 \; m/s$ would take $\frac{2452}{100} = 24.52 \; seconds$

$1571m$ at a speed of $80 \; m/s$ would take $\frac{1571}{80} = 19.6375 \; seconds$

Total time: $24.52 + 19.6375 = \boldsymbol{44.1575 \; seconds}$