Steps taking to tune the PID parameters:

Step#1: Implemented Twiddle algorithm in PID class. Entire function was written in function Twiddle(double cte). I tried to integrate with eh main function that will tuning the parameters on the fly and also whenever, error crosses the threshold, twiddle algorithm will be invoked and tuned.

This approach failed because car was veering off before parameter get tuned.

Step#2: After observing the pattern in PID class and reading thru forums, I observed that Kp, Ki & Kd are in range of

Kp - [0.1 to 1]

Ki - [0.0001 – 0.01]

Kd – [2.5 – 14]

Therefore, I took random value of 1, 0.01, 14. I tried adjusting these value and after many round of testing, I found a combination

Kp = 0.5

Ki = 0.01

Kd = 9.

Car was able to complete the track and also minmized wobbling.

Improvements that can be done

1. This might be manual approach. However, I will later try to research and identify available algorithms that will help in this situation.
2. Come up with program that will use the TRAINING MODE and capture all CTE. This can be used in Twiddle to calculate the parameters.