LED Current

Being relatively new to the Raspberry I have been concerned about the current limitations of both the processor and the individual GPIO leads. One of the starter lessons is to drive an LED, but per the vendor specifications it draws 20 milliamps (ma). The specifications for the Raspberry is 16 ma per lead and around 50 ma total.

This left me concerned about the general performance so I decided to perform a test of an LED, resistor, and a potentiometer without using the Raspberry. Objective was to see how much current the LED required for a level of brightness. My measurements were with a voltmeter measuring the voltage across the LED, resistor, and potentiometer, then calculating the current through the resistor. I attempted to measure the current but my meter interfered too much with the circuit operation. In this particular test I used a 5 volt source.

Evaluation the LED brightness was kind of arbitrary on my part and one can easily say my evaluation could be adjusted.

The following are my final results.

What I concluded was that the LED functions very well at about 2 ma and providing a illumination of approximately 70% of its brightest level.

Total Resistance	Resistor Current ma	LED Brightness
103.0	29.0	10
117.0	26.0	9
980.0	3.3	8
1940.0	1.7	7
2900.0	1.1	7
3100.0	1.1	6
3900.0	0.9	6
5360.0	0.6	5
6180.0	0.6	4
6600.0	0.5	3
7400.0	0.5	3
8200.0	0.4	2
9800.0	0.4	1
9900.0	0.4	1
10100.0	0.4	1