This study investigates the potential of green belts with air pollution-tolerant plant species to mitigate pollution in an eco-friendly and cost-effective manner. This research work assesses the Air Pollution Tolerance Index (APTI), Anticipated Performance Index (API) and Membrane Stability Index (MSI). For this, 15 dominant roadside plant species were selected i.e., *Alstonia scholaris, Azadirachta indica, Bombax ceiba, Callistemon lanceolatus, Conocarpus erectus, Cassia fistula, Euphorbia milli, Diospyros malabarica, Ficus benjamina, Ficus religiosa, Ficus virens, Mimusops elengi, Polyalthia longifolia, Pongamia pinnata* and *Terminalia mantaly.* Four biochemical attributes were considered i.e., Relative water content, total chlorophyll content, pH, ascorbic acid content and various morphological, biological and socio-economic parameters to estimated APTI, API and MSI of these plants. The study was conducted at seven busiest road sites and compared with less polluted site (Control). Results indicated that *Conocarpus erectus* (8.532±0.020) and *Euphorbia milli* (6.39±0.031) the most tolerant and sensitive plant species based on their APTI value. API analysis revealed that *Conocarpus erectus* as an excellent performer, maintaining physiological functions and reducing pollutants. Other species, such as *Alstonia scholaris, Ficus religiosa, Mimusops elengi, Cassia fistula* and *Polyalthia longifolia* also demonstrated high tolerance and performance. Highest MSI value was observed in *Ficus religiosa* (82.7±0.451) This research contributes to the development of management strategies to combat urban air pollution, highlighting the potential of roadside plant species in pollution mitigation.