We present the results comparison between the slow solar wind plasma parameters obtained in the extended corona by the UV spectroscopic data from the Ultraviolet Coronagraph Spectrometer (UVCS) on-board SOHO and STEREO during the past minima of solar activity (CR1913; and CR2066) and the results of a time-dependent 2.5D three-fluid MHD model of the coronal streamer belt. The previous three-fluid (e, p, and O$^{5+}$ or He$^{++}$) streamer model has been improved by considering real solar magnetic field obtained by Wilcox Solar Observatory as boundary condition, and PFSS model as initial state of the magnetic configuration. This is the first study that incorporates real magnetic field in the three-fluid model. The model was run until fully self consistent streamer was formed in the quasi-steady state. The electron density reconstructed from STEREO Cor1 observations was compared to the results of the three-fluid model to validate the model. The plasma parameters from the multi-fluid model were used to compute the expected UV observables from HI Ly-$\alpha$ and OVI 1032 spectral lines and the results were compared in details with the UVCS measurements.