This study examined the weekend/weekday patterns for both ozone and nitrogen dioxide levels using hyperspectral data collected by Ozone Monitoring Instrument (OMI) onboard NASA’s Aura satellite and EPA’s Outdoor Air Quality Data acquired in 2017 for the Los Angeles area, USA. EPA’s surface level ozone and nitrogen dioxide readings from 18 different sites in Los Angeles area were separated, tabulated, and averaged out by each five-weekdays and two-weekend days for the entire 2017. Ozone Monitoring Instrument’s total column ozone and tropospheric nitrogen dioxide readings were collected for each and every Monday-Friday and Saturday-Sunday of 2017. The data collected was processed in VERDI software in order to get numerical values. EPA data then was subsequently compared with OMI’s data. EPA ozone readings show a clear inverse relationship to nitrogen dioxide levels. OMI tropospheric nitrogen dioxide levels also mirror for all 12 months the same pattern shown by EPA surface data but OMI’s total column ozone pattern level is only consistent 8 out of 12 months rendering it inconclusive as to the ozone pattern to match the trend with surface level ozone pattern. This investigation is significant since it looks at recent readings from EPA and OMI. It is also important for the health of Los Angeles residents because increased concentration of ambient ozone often leads to increase in hospital visits for asthma (Weisel et al., 1995) and lung function impediment as well as permanent lung structure changes and premature death (Tropospheric Ozone).

**Key words:** Ozone, nitrogen dioxide, weekend effect, OMI