There has been an effort by the public institutions in Kenya to improve the performance of the procurement function. However, poor performance is still a challenge. These institutions are burdened with delays and occasional inability to deliver goods to the designated organizations within the required time. The goods are of poor quality that does not meet the user's requirements. This problem has led to a decline in the performance of enormous public organizations. The procurement department in universities is one of the fastest growing departments. They are headed by Procurement managers whose primary responsibility is coordinating procurement and disposal activities and offering professional advice to the University. The department faces several challenges in implementing the Public Procurement and Asset Disposal act (2015), which requires strict adherence to lengthy bureaucratic procedures. The study's general objective was to investigate the influence of procurement planning on procurement performance in public universities. The specific objectives were to determine the influence of Need assessment, cost estimation, quality specifications and risk management on procurement performance in selected public universities in Kenya. The study was grounded on systems, stakeholder, and resource-based theories. The study adopted a descriptive research design. The target population of the study was 324 participants, the sample size was 102, and stratified sampling was adopted. The study used primary data, which was collected through questionnaires. Multiple linear regression models aided in the analysis to determine the influence of independent variables on the dependent variable with the help of Statistical Packages for Social Sciences (SPSS Version 28.0). The significance of each independent variable was tested using a t-test, while the overall significance of the model was tested using F-test at a 5% significance level. The results implied a significant relationship between procurement planning and procurement performance. The t statistics and significance level established a statistically significant positive effect on needs assessment, cost estimation, quality specification, risk management, and procurement performance of public universities in the Eastern region at a 5% significance level with coefficients of 0.059, 0.100, 0.105 and 0.376 and p-values 0.405, 0.012, 0.040 and 0.000 respectively. Further, the study found that compliance with government procurement regulations moderated the relationship between procurement planning and procurement performance. The study concluded that public universities should encourage effective use of need assessments, cost estimations, quality specification, and risk management; they positively impacted public universities' procurement process in the Eastern region. The findings of this study are expected to be helpful; for public universities, as they would provide valuable complementary knowledge in formulating policy and a regulatory framework on procurement planning in Public Universities. Academicians are expected to use this information to add to their understanding of procurement planning and performance. It is expected to further lead to new knowledge generation and bridge existing gaps. It will be necessary for policymakers and stakeholders in Kenya's public procurement supply chain. The study will be a crucial ingredient in; planning, designing, and implementing a sound public procurement planning that will align itself to the overall economic strategy. It would also introduce new comparative knowledge for procurement departments to deal with challenges in implementing procurement planning.