

## **Examination of the Influence of the Near-Surface Geology on the Initial Infrastructural Development Using High-Resolution Seismic Method**

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**Abstract :** This research work on high-resolution seismic tomography method was carried out with the aim of investigating how near-surface geology influences the initial distribution of infrastructural development in an area like Otuoke and its environs. To achieve this objective, seismic tomography method was employed. The result revealed that the overburden (highly-weathered layer) thickness ranges from 27 m to 50 m within the survey area, with an average value of 37 m. The 3D surface analysis for the overburden thickness distribution within the survey area showed that the thickness of the overburden is more in regions with less infrastructural development, and least in built-up areas. The range of velocity distribution from the surface to within a depth of 5 m is about 660 m/s to 1160 m/s, with an average value of 946 m/s. The 3D surface analysis of the velocity distribution also revealed that the areas with large infrastructural development are characterized with large velocity values compared with the undeveloped regions that has average low-velocity values. Hence, one can conclusively say that the initial settlement of Otuoke and its environs and the subsequent infrastructural development was influenced by the underlying near surface geology (rigid earth), among other factors.

**Keywords :** geology, seismic, infrastructural, near-surface

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