**URBAN MORPHOLOGY ANALYSIS BY REMOTE SENSING AND GIS TECHNIQUE, CASE STUDY: GEORGETOWN, PENANG**

**1Marina Mohd Nor and 2Norzailawati binti Mohd Noor**

*1Post Graduate Student, Master of Urban and Regional Planning*

*2Asst. Prof. at the Dept. of Urban and Regional Planning*

Urban and Regional Planning Department,

Kulliyah Architecture and Environmental Design,

Intenational Islamic University of Malaysia,

50728, Kuala Lumpur, Malaysia,

marina.mn@gmx.com and [norzailawati@iium.edu.my](mailto:norzailawati@iium.edu.my)

**Keywords:** Urban morphology, GIS, Remote sensing, urban planning, urban societies

**Abstract:** This paper was analyzed the potential of applications of satellite remote sensing to urban planning research in urban morphology. Urban morphology is the study of the form of human settlements and the process of their formation and transformation. It is an approach in designing urban form that considers both physical and spatial components of the urban structure. The study has conducted in Georgetown, Penang purposely main to identify the evolution of urban morphology and the land use expansion. In addition, Penang is well known for its heritage character especially in the city of Georgetown with more than 200 years of urban history. Four series of temporal satellite SPOT J on year 2004, 2007, 2009 and 2014 have been used in detecting an expansion of land use development aided by ERDAS IMAGINE 2014. Three types of land uses have been classified namely build-up areas, un-built and water bodies show a good accuracy with achieved above 85%. The result shows the built-up area significantly increased due to the rapid development in urban area. Simultaneously, this study provide an understanding and strengthening a relation between urban planning and remote sensing applications in creating sustainable and resilience of city and future societies as well.