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Optimal zoning configurations for solar access in high rise developments

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Abstract: The increase the solar access on structures is part of the solution to reduce the demand for coal generated energy. It allows designers to use passive solar strategies and active solar power technology to integrate within buildings. However, within a dense city fabric, where many tall buildings exist, the task of optimizing solar access presents a number of challenges to designers. This study compares 10 different city planning patterns within a fixed software apparatus to see which configurations achieve optimal sun exposure. Furthermore, it takes these patterns and applies them to three different orientations in both Los Angeles and New York. This allows a comparison of not only configurations, but also orientations and geography to help determine possible configurations that a new high-rise development can adopt to maximize solar access. The purpose of this thesis is to measure which high rise building configurations best maximize solar access to potentially reduce overall city energy consumption by creating more opportunity to integrate passive and active solar applications in buildings within a growing urban society. Since very few studies have been conducted in this area of research, it is the hope for this thesis to be a starting point for many future studies to follow.

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