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A Future Urban Street Design in Baltimore, Maryland Based on a Hierarchy of Functional Needs and the Context of Autonomous Vehicles, Green Infrastructure, and Evolving Street Typologies

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Abstract : The purpose of this paper is to examine future urban street design in the context of developing technologies, evolving street typologies, and projected transportation trends. The goal was to envision a future urban street in the year 2060 that addresses the advent and implementation of autonomous vehicles, the promotion of new street typologies, and the projection of current transportation trends. Using a hierarchy of functional needs for urban streets, the future street was designed and evaluated based on the functions the street provides to the surrounding community. The site chosen for the future street design is an eight-block section of West North Avenue in the city of Baltimore, Maryland. Three different conceptual designs were initially completed and evaluated leading to a master plan for West North Avenue as well as street designs for connecting streets that represent different existing street types. Final designs were compared with the existing street design and evaluated with the adapted 'Hierarchy of Needs' theory. The review of the literature and the results from this paper indicate that urban streets will have to become increasingly multi-functional to meet the competing needs of the environment and community. Future streets will have to accommodate multimodal transit which will include mass transit, walking, and biking. Furthermore, a comprehensive implementation of green infrastructure within the urban street will provide access to nature for urban communities and essential stormwater management. With these developments, the future of an urban street will move closer to a greenway typology. Findings from this study indicate that urban street design will have to be policy-driven to promote and implement autonomous bus-rapid-transit in order to conserve street space for other functions. With this conservation of space, urban streets can then provide more functions to the surrounding community, taking a holistic approach to urban street design.

Keywords : autonomous vehicle, greenway, green infrastructure, multi-modality, street typology
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