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INVESTIGATING GEOSPARQL REQUIREMENTS FOR PARTICIPATORY URBAN PLANNING

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Abstract. We propose that participatory GIS (PGIS) activities including participatory urban planning can be made more efficient and effective if spatial reasoning rules are integrated with PGIS tools to simplify engagement for public contributors. Spatial reasoning is used to describe relationships between spatial entities. These relationships can be evaluated quantitatively or qualitatively using geometrical algorithms, ontological relations, and topological methods. Semantic web services utilize tools and methods that can facilitate spatial reasoning. GeoSPARQL, introduced by OGC, is a spatial reasoning standard used to make declarations about entities (graphical contributions) that take the form of a subject-predicate-object triple or statement. GeoSPARQL uses three basic methods to infer topological relationships between spatial entities, including: OGC's simple feature topology, RCC8, and the DE-9IM model. While these methods are comprehensive in their ability to define topological relationships between spatial entities, they are often inadequate for defining complex relationships that exist in the spatial realm. Particularly relationships between urban entities, such as those between a bus route, the collection of associated bus stops and their overall surroundings as an urban planning pattern. In this paper we investigate common qualitative spatial reasoning methods as a preliminary step to enhancing the capabilities of GeoSPARQL in an online participatory GIS framework in which reasoning is used to validate plans based on standard patterns that can be found in an efficient/effective urban environment.

[Conference paper](#) (PDF, 1380 KB)

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