

**Macrocategoria:** Geometria e Sicurezza

**Titolo articolo:** Turbo-Roundabouts as an Instrument for Improving the Efficiency and Safety in Urban Area: An Italian Case Study

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**Abstract:** In recent years, numerous turbo-roundabouts have been built in many European countries. To date, there are no turbo-roundabouts in Italy and even the regulations do not provide for their implementation. Turbo-roundabouts are considered the ideal alternative to multi-lane roundabouts as they have numerous advantages. However, they offer better operational performance only for specific traffic flow distributions. This research used the case study of an important and complex urban arterial road in eastern Sicily, Italy, to compare the operational and safety performance between multi-lane roundabouts and turbo-roundabouts. The evaluations were carried out with two simulation software: (1) AIMSUN Next 20.0.1 (operational performance); (2) SSAM 3.0 (safety performance). The results show that at medium/low traffic volumes, multi-lane roundabouts are significantly superior to turbo-roundabouts in terms of operational performance. At high traffic volumes, the operational performance of turbo-roundabouts improves significantly. As regards the safety parameters, for turbo-roundabouts there is always an increase in the TTC and PET, a reduction in maximum speeds and decelerations. There is also a significant decrease in conflict points. Ultimately, the safety and efficiency performance of turbo-roundabouts should: (1) Encourage administrations to replace the multi-lane roundabouts (illegal in Italy) with turbo-roundabouts; (2) encourage Italian legislators to revise intersection design legislation to include turbo-roundabouts among possible design solutions

**Keywords:** urban road infrastructures; turbo-roundabouts; road safety; congestion; traffic scenarios

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