

## Dynamic perimeter control

Traffic congestion remains a persistent challenge in urban areas, particularly during peak travel periods when demand exceeds network capacity. Traditional traffic signal control systems often struggle to manage such conditions effectively. Existing perimeter control approaches, which regulate traffic entering congested zones, typically rely on fixed geographical boundaries and static control rules. As a result, they lack the flexibility required to respond to rapidly changing traffic conditions.

### What is the product?

We propose a novel **dynamic perimeter control strategy** that enables a more adaptive and responsive form of traffic regulation. The approach controls the amount of traffic entering congested urban areas while explicitly incorporating public transport prioritization as a design objective.

At its core, the strategy relies on an auction-based gating mechanism that dynamically adjusts how access to the controlled area is regulated. The system can switch between normal intersection operations and perimeter control modes depending on real-time traffic conditions. Importantly, this can be implemented using existing traffic signal infrastructure by adjusting signal timings, meaning that no additional physical installations are required.

Preliminary results from simulation studies indicate that the approach improves queue management, enhances flow stability, and allows for more precise control of inflow levels. This suggests strong potential for practical deployment in cities seeking to prevent network breakdowns and maintain efficient traffic conditions.

### Who is it for?

The method is particularly relevant for:

- **Traffic managers and urban planners** that are responsible for real-time traffic control and seek adaptive solutions for managing congestion in urban areas.

