

Summer Research Program 2011/2012

Project Title: Freeway Ramp Metering in the Presence of a Distant Downstream Bottleneck

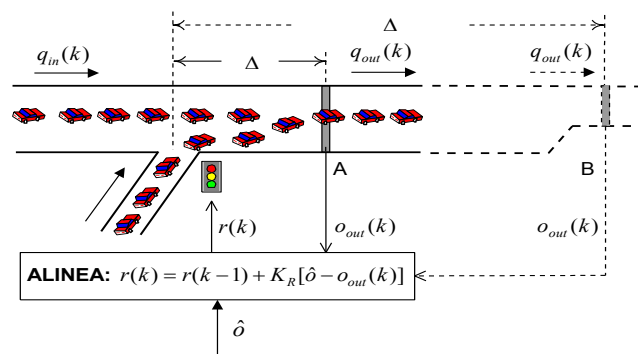
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Objective

Ramp metering is an important control measure for regulating freeway inflows at freeway on-ramps in order to reduce or avoid merging congestion, maintain efficient freeway operation, and increase traffic safety. This project focuses on developing and testing local ramp metering controllers to address the situation where bottlenecks are present at the distant downstream of a metered on-ramp.

Description

As illustrated in the figure, a ramp metering controller determines the ramp signal setting in real time based on traffic measurements collected from the freeway mainstream to prevent excessive inflow from the on-ramp so as to avoid merging congestion. This paper aims at the ramp metering task in the presence of a bottleneck at the far downstream of the shown on-ramp.



Local ramp metering and ramp metering controller ALINEA.

Students who are familiar with feedback control theory and C-programming are expected.