# 10.Gipps 推导

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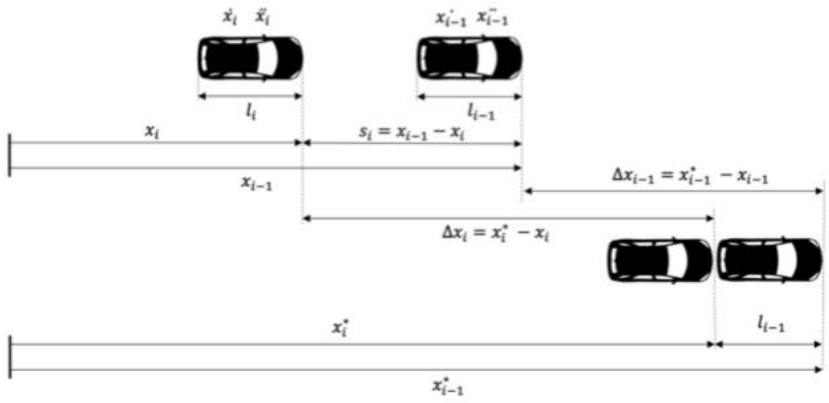


有如下关系：

$$x^*_{i-1} - x_i \geq x^*_i - x_i + l_{i-1}$$

整理后可得

$$(x^*_{i-1} - x_{i-1}) + (x_{i-1} - x_i) \geq x^*_i - x_i + l_{i-1}$$

即：

$$\frac{{v_{i-1}}^2(t)}{2a_{i-1}} + s_i \geq \frac{v_i(t) + v_i(t+\tau)}{2}\tau_i + \frac{v_i^2(t+\tau)}{2a_i} + l_{i-1}$$

$$\frac{v_i^2(t+\tau)}{2a_i} + \frac{v_i(t+\tau)}{2}\tau_i - (\frac{{v_{i-1}}^2(t)}{2a_{i-1}} + s_i - l_{i-1} - \frac{v_i(t)\tau_i}{2}) \leq 0$$

解得

$$v_i(t+\tau_i) \leq -a_i\tau_i + \sqrt{{a_i}^2{\tau_i}^2 + a_i(-v_i(t)\tau_i + \frac{{v_{i-1}(t)}^2}{2a_{i-1}} - 2l_{i-1} + 2s_i)}$$