13.Changing lanes

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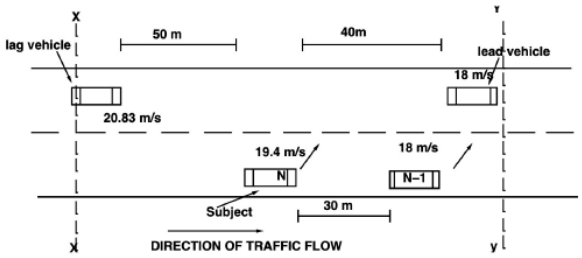
For the scenario shown in the following figure, find the probability of changing lanes



Assume that

- $\sigma^{lead} = \sigma^{lag} = 2$
- $\beta^{lead} = \beta^{lag} = 1$
- $X_i^{lead,TL}(t) = X_i^{lag,TL}(t) = 0.8$
- $\nu_i = 0.7$ and $\alpha^{lead} = \alpha^{lag} = 1.2$

代入：

$$\mathbb{P}\left[g_i^{x,lead,TL}(t) > g_i^{x,cr,lead,TL}(t)|\,TL,\nu_i\right]\mathbb{P}\left[g_i^{x,lag,TL}(t) > g_i^{x,cr,lag,TL}(t)|\,TL,\nu_i\right]$$
$$= \Phi\left(\frac{\ln(g_i^{x,lead,TL}(t)) - \beta^{lead}X_i^{lead,TL}(t) - \alpha^{lead}\nu_i}{\sigma^{lead}}\right)$$
$$\Phi\left(\frac{\ln(g_i^{x,lag,TL}(t)) - \beta^{lag}X_i^{lag,TL}(t) - \alpha^{lag}\nu_i}{\sigma^{lag}}\right)$$

$$\phi(\frac{\ln(50)-0.8-1.2*0.7}{2})\phi(\frac{\ln(40)-0.8-1.2*0.7}{2})$$

$\phi(1.14)\phi(1.02)$

经查表 0.8729*0.8461=0.7386=73.86%