## calculations relative green

We have the following green phases in each intersection.

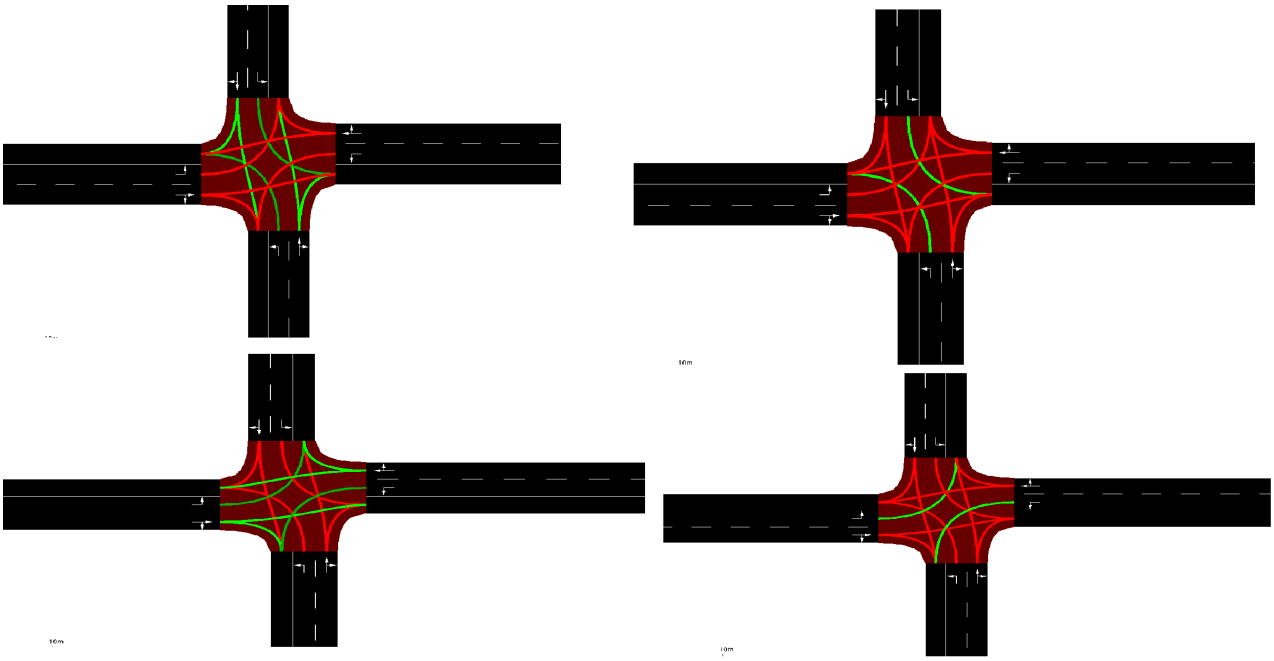

Figure 1: different green phases in 3x3 intersection

The calculation of the relative greens is related to the input stream in an intersection. If we call the input stream from the street i $I_i$ and the turn probability from the i-th street to the j-th street $p_{ij}$ then we can determine the relative green time using an weighted average. Note that the streets are numerated from 1 (north) increasing clockwise to 4 (west). For the first relative green time (figure 1 upper left) we get the following calculation

$$rg_{phase1} = \frac{max(I_1(p_{13} + p_{14}) + I_3(p_{31} + p_{32}))}{\sum_{i=1}^{4} phase_i} \tag{1}$$

This is because, we have an input stream from street 1 divided (according to the turn probability's) into street 3 ($I_1 p_{13}$) and street 4 ($I_1 p_{14}$). The same is done for the input stream $I_3$. Then this value is divided by the sum of all green phases. This procedure is then used to calculate all four phases.