The weighted bidding scores then serve as an input to the allocation process of priority time, represented by a negotiation algorithm. The algorithm modifies the reference signal plan received from the signal controller. Requested prioritisation measures (special PT stages, adjusted green timings as well as one stage rotation per cycle) can be implemented. The algorithm simplifies the needed optimisation by creating multiple so-called „candidate signal plans“ which offer a different combination of prioritisation measures. Additionally, an optimal time point is identified for every stage transition. In the end, the sums of all delay-weighted bidding scores that can be accommodated by a candidate signal plan are determined. The plan with the highest score will be returned to the signal controller together with additional information on decisive PT vehicles for the stage transitions, enabling the signal control to adjust the stage transitions to the real-time arrivals. The method therefore acts as a plug-in providing an advanced form of PT pre-requests.

The negotiation aspect is represented by four variables influencing the negotiation process from a collaborative perspective: A „green time balancing factor“ makes it harder to repeatedly shorten a stage. Additionally, bids that request interruptive measures or lead to extreme short green times are penalised. Further, candidate signal plans with an increased number of stage transitions receive a reduced score.

The method differs from existing controllers in two ways. First, the control considers arrivals over the whole cycle time and is therefore able to act in a proactive rather than a reactive manner. Second, the approach provides a more flexible architecture compared to common rule-based approaches. The method has not been evaluated yet and is therefore subject of ongoing research.

References: