

Influence of Intergreen Times on the Capacity of Signalised Intersections

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Background



The duration of intergreen times (Figure 1) is critical for both the **safety and the capacity** of signalised intersections. The determination follows similar, but **different methods around the world**. The exact capacity impacts have not been researched before. Their knowledge is important to develop efficient calculation methods which take the **random character of traffic** into account.

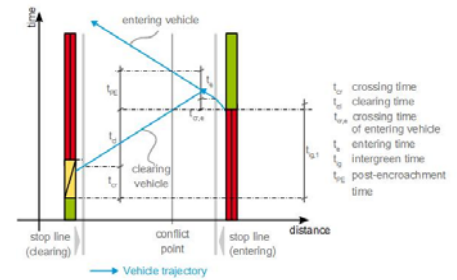


Figure 1 Illustration of intergreen

Purpose

- Compare procedures internationally.
- Analyse the traffic flow during the signal change.
- Determine the capacity impact of intergreen.
- Derive improvement potential.

Method



Figure 3
Speed measurement

- Trajectories of vehicles have been analysed (Figure 1)
- A closer look at the traffic flow revealed the possible conflicts at intersections and their probability (Figure 2).
- A capacity model was developed which considers the various factors on the traffic flow.
- Empirical data was gathered at signalised intersections in Germany (speed measurements and video observations, Figures 3 & 4).

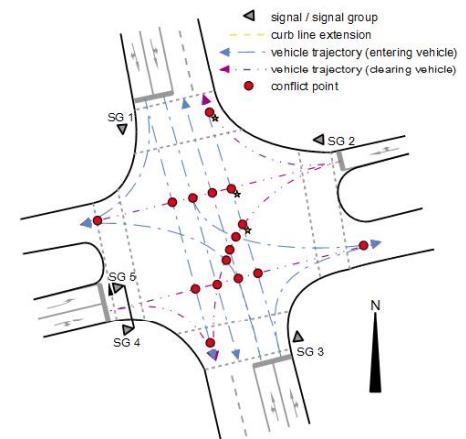


Figure 2 Illustration of conflicts

Application

The empirical evaluation revealed a maximum improvement potential of about 30% of the intersection capacity.

Conflicts leading to very long intergreen times are often rare events. Entering times are not taken into account, unnecessarily stretching the intergreen time.

While the variation of single parameters at individual intersections was often quite low, conspicuous differences among approaches could be observed (e.g. Figure 5).



Figure 4
Video observation with extension mast

Conclusion

- Capacity improvements appear possible by an advanced intergreen calculation procedure (based on a stochastic safety evaluation) and by the consideration of signal change intervals during the design of intersection layout and signal program.
- Most input parameters do not vary much at single approaches, but depend largely on the situation.

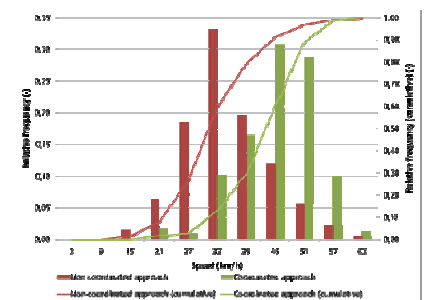


Figure 5 Clearance speeds

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