











(t>y)

( t>x)















Legend: Leipziger Str

: Sink Node 

: Source Node

: Cars waiting at signal.

x: time taken for signal to turn green. Am Fuchsberg E-Weinert

Guard function common at all signals.

y: time taken for pedestrian signal to turn green.

: Cars have enough space is TRUE 

: Lanes used by only cars

: Lanes used by Cars and Tram

: Lanes used by only Tram

x: Time taken by the car coming in the opposite direction.

Data:

Rechtsabbieger Am Fuchsberg

Geradeausfahrer Am Fuchsberg

Linksabbieger Am Fuchsberg

Rechtsabbieger Leipziger Straße (N)

Geradeausfahrer 1 Leipziger Straße (N)

Geradeausfahrer 2 Leipziger Straße (N)

Linksabbieger Leipziger Straße (N)

Rechtsabbieger Erich-Weinert-Straße

Geradeausfahrer Erich-Weinert-Straße

Linksabbieger Erich-Weinert-Straße

Rechtsabbieger Leipziger Straße (S)

Geradeausfahrer Leipziger Straße (S)

Linksabbieger Leipziger Straße (S)

BG1 + BG2

QA1 + QB1 + QC1 + QD1

Define the assumptions with justification:

1. Pedestrians are all of the same type
2. We assume all the cars are of the same type.
3. In the model, trams are represented by a different type of vehicle (rail) in order to model different behavior and impact on the traffic light phases.
4. No major changes in the behavior between different years (amount of cars going in each direction, amount of cars being generated by the source, interarrival times, etc.).
5. Pedestrians go in only one direction. We will model different sources for each of the possible directions.
6. Pedestrians will always press the traffic light button.

Necessary Data:

1. Interarrival times of cars.
2. Number of cars going in each direction.
3. Traffic light duration: ideally for the whole day, depends on whether we can get / collect the data.
4. Tram times.
5. Tram and cars alternation.
6. Pedestrians: interarrival times, waiting time before crossing the street (traffic light), time to cross the street, effect of pressing the traffic light button.
7. Data on the adjacent road (maybe, if we see there is any impact from it).

Define the quantities to be used as simulation results

1. Throughput
2. Queue length
3. Average time between source and sink
4. Average speed of cars (hard to measure when modelling only with distributions).

The experiments that will be performed?

1. Open traffic lights for each direction in different phases.
2. Overload the system to check behavior if the amount of cars increases in any of the sources.

Relevant events:

1. Traffic light opens (for each of the intersections)
2. Traffic light closes (for each of the intersections)
3. Pedestrian presses a button (for each of the intersections)
4. Tram arrives at the intersection
5. Cars start moving

Underlying distributions:

1. Cars and pedestrians: exponential (interarrival times)