The paper proposes to consider a microscopic model of traffic flow on
the example of a major city. The model is based scheme of following the
leader, the calculation is similar predictor-corrector scheme in the theory
of differential calculus. The model takes into account the various changes
the flow: speed characteristics of vehicles, narrowing roads, changing traffic
lights, random start vehicles with a given destination, the transit flow of cars
through the city, etc. Parameters of vehicles, such as speed and position
are computed in two stages. In the first step the values predicted at the
time, roughly equal to the time the driver’s reaction. In the second step, the
obtained values are used as a predictor to obtain more accurate values. The
problem of finding the optimal operation of traffic lights to ensure maximum
capacity is reviewed. Without loss of generality, we define the operation
of traffic lights with function $f(\beta_1\ldots\beta_P)$ using the shift periods $\beta_1\ldots\beta_P$
relative to the base period $\beta_0$ where $P$ is the number of traffic lights in the
region. The average speed of transit traffic that goes through the area is the
objective function that we need to maximize by choosing the value of the
shift periods. This task is in some sense, the task of searching the so-called
"green wave".