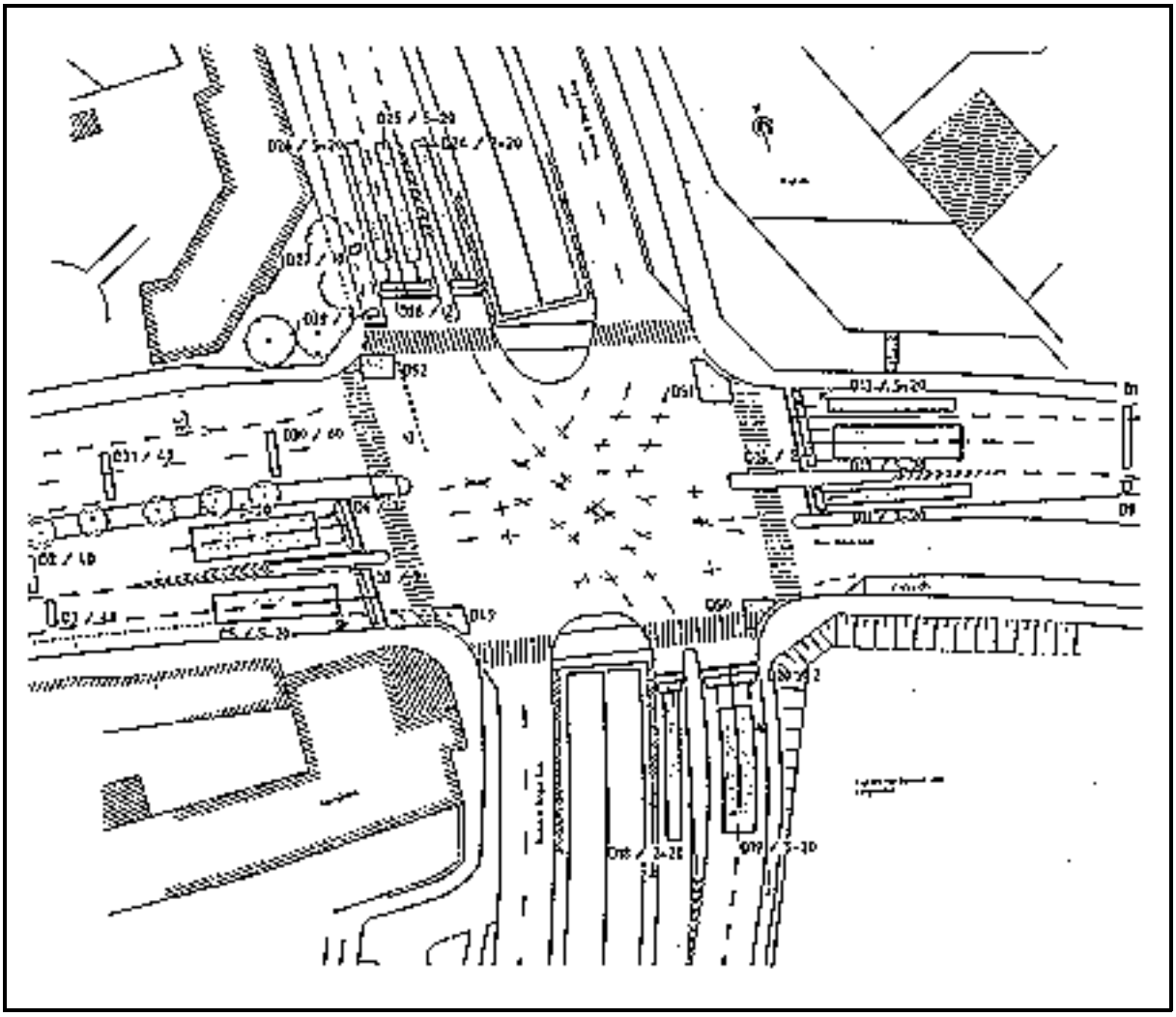
C-21 Detection of cyclists at signalized junctions with a traffic-responsive control system

Country: Denmark **Year of implementation: -**

Photo or drawing



Example of location of detectors for cyclists turning left
Drawing: Municipality of Odense

Description

At junctions with a traffic-responsive control system (TRCS), the number of incoming vehicles controls the duration of the green phase. TRCS is used especially in situations with a random distribution of the incoming traffic, mostly in case no other traffic signals nearby which could send vehicles in groups/ platoons to the junction at hand. The advantage of TRCS is that the green phase is always adapted to the current need. In principle, this entails that road users will not get a red light unless there is traffic in conflicting directions.

Denmark has ca 2700 signal installations, of which 1500 are with TRCS (in 1992).

TRCS provides the road users with good service, especially in conditions with low volumes, since it is possible (especially for car drivers) to go through the junction with little or no delay. /17/.

The detectors for cars are drilled into the asphalt or placed in the road before it was paved.
Bicycles can be detected either by detectors similar to those used for cars, or similar to those used for pedestrians; so manually by a push button.
The problem for cyclists in junctions with a traffic-responsive system is that they are often detected manually, using a cyclist push button or a combined cyclist-pedestrian push button. If the cyclists are not aware that the junction has a TRCS and finally presses a push button, unnecessary waiting time can result, and in the worst case scenario, the cyclists becomes a red-light runner. To avoid this situation, cyclists can be detected in the same way as cars.

At most junctions the detection of the cyclist occurs behind the stop line. In Denmark cyclists who turn left have to make an indirect (large) turning. So at first the cyclist crosses the road as if he was going straight ahead. Then he stops at the stop line of the road he wants to enter.
These cyclists are not detected if they stop just in front of that stop line. This problem can be solved by placing detectors in front of the stop line as well. The detectors are designed to fit with the geometric conditions at the individual junctions. This way, cyclists both behind and in front of the stop line are detected.

To avoid that cyclists who are not going to the left, will activate the detectors, a minimum of two seconds will pass before the message is passed on from the detectors to the control system.

Different aspects for cyclists

Positive
- Cyclist friendly: By using detectors, left turning cyclists do not have to activate manually a cyclist or pedestrian push button.
- Cyclist safety: No actual evaluation of the effect of cyclist detectors has been carried out.

Negative
- The unfortunate thing about detectors is that cyclists have to stop on a well-defined, but not clearly marked area in order to be detected.
- At junctions where many cyclists drive close together, there is the possibility that detectors are activated unnecessarily. If a group of cyclists block the detector for more than 2 seconds, the detector "thinks" that there are cyclists waiting in the cross-wise direction, and the signal might, change to green in the cross-wise direction.

Different aspects for non-cyclists

Positive
- junctions with a traffic-responsive control system minimize the delay.

Negative
- Pedestrians often get a longer waiting time at junctions with TRCS, because they have to announce their arrival by pressing a push button. Not all pedestrians notice the push button upon arrival, and therefore, their waiting time is increased. A case study showed that 80% of pedestrians

actuated the junction upon arrival, while the remaining 20% waited an average of 13 seconds after arrival before they "discovered" the detecting button. /15/.

Other comments

Degree of implementation:
Detectors for cyclists are used around the country.

In Odense, there are some junctions that have detectors for left turning cyclists, and henceforth, new junctions with a traffic-responsive control system in Odense will use detectors for left turning cyclists as a standard procedure.

Costs

Costs per detector: ca. 10,000 DKK (ca. 1,370 ECU).

Contact person

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