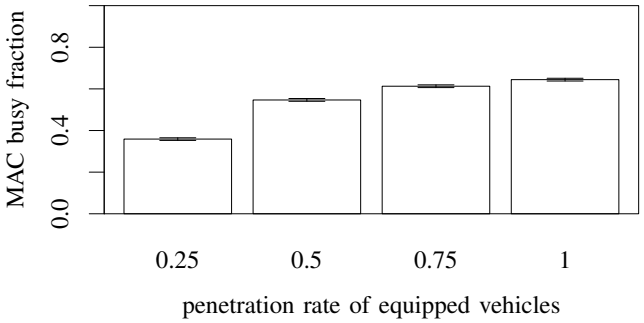

Figure 9: The MAC busy fraction for the realistic scenario while downloading 1024 kB.

In these simulations, we also investigated the application layer packet delay, i.e., the time it takes from the creation of the data until it is received by the downloading application. Note that, there is potential delay included for acquiring the correct gateway for the packet. With such a high load on the network, packets had to stay longer in queues and/or needed retries to be transmitted. This was especially visible for a data size of 1024 kB, where only 11 % of packets arrived in less than 1 s. However, only 3 % of the packets took longer than 10 s. This delay can still be acceptable for non-safety application scenarios.

5 CONCLUSION

In this paper, we outlined a concept for virtual network infrastructure based on parked cars. By clustering such cars, we are able to create a stable backbone network that can be used for data transmissions from and to passing cars as well as to store data. In particular, we presented a handover scheme that supports continuous connection to such a cluster. In our investigation, we observed that the load on the network quickly increases if all parked cars act as gateway nodes between cluster and road. To prevent this, we developed an algorithm to select cars as gateways while still providing sufficient coverage for successful connections to moving cars. In our evaluation, we have shown that this approach greatly reduces the load on the network while barely decreasing the success rate for transferred data. We investigated the problem in a realistic scenario and discovered that the performance decreases with an increase in penetration rate of cars download data from the cluster – which points to potential future work regarding load balancing mechanisms.

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