been reached at intersection $I_2$ through route $R_1$ to $R_2$ where the decision making node $N$ takes an important decision. The node $N$ selects route $R_4$ and finally reaches at destination node $D$ through $R_5$. However, Figure 1(b) depicts the two problems arise when these protocols are implemented on real-world urban traffic scenario. First, it might be possible that there is no node at intersection $I_2$ within the period of Time-to-Live (TTL) to make an important decision. In this case, the message is forwarded to next available node away from the intersection. Second, if there is no vehicle on next routes, $R_4$ and $R_6$, it can cause unnecessary traffic overhead in the network and longer delays for packets.

Another major problem in VANET routing protocols is the dead-end roads that may cause many data packets dropped, failure notification increases significantly, low delivery ratios, and fail to find shortest path. As illustrated in Figure 2, in most of the existing geographical routing protocols the message forwards to nodes $A$, $B$, and $C$ on a dead end road which is the shortest path from $S$ to $D$. However, the message should follow the dotted path as depicted in Figure 2. Greedy Distributed Spanning Tree Routing (GDSTR) [12] proposed to find shorter routes and generates less maintenance traffic if greedy forwarding fails at the dead-end roads. GDSTR creates and maintains hull trees to guide packets around dead-ends instead of using planarization algorithm. The simulation results have shown that GDSTR incurs significantly lower overhead than protocol proposed in [13]. A geo-proactive overlay routing called Landmark Overlays for Urban Vehicular Routing Environments (LOUVRE) [3] proposed to create an overlay links on top of an urban topology. In LOUVRE, the nodes at intersections are defined as landmark and the overlay links are only possible if there are enough traffic density between intersections. LOUVRE’s

Figure 2: Dead end roads can cause unnecessary overhead in VANET