Delay Tolerant Mobile Networks (DTMNs) provide communication despite the occasional presence of disconnected subnetworks. They rely on finding a set of sequential opportunistic encounters between pairs of mobile nodes. In this context, understanding mobile node behaviour is essential to design effective and efficient network protocols. Previous studies aimed to predict future encounters where predictions depend on exploring the probability/ age of encounters and integrated interactions in the mobile data. However, those previous solutions suffer from unstable predicted encounters with lack of routing information such as encounter times. As an alternative to prediction, we propose to exploit periodicity within mobile data to find stable (periodic) encounters for routing in DTMNs. In this thesis, we first present a generic methodology to model and find periodic encounter patterns by using the auto-persistence function and detection techniques derived from it. Secondly, we propose a novel graph model to capture periodic encounter patterns where routing problems can be modelled and solved as optimization problems. Lastly, to connect disconnected subnetworks that are strongly connected inside, e.g., by periodic encounters, in the networks we introduce stationary relay nodes whose deployment is modelled as various k-connectivity problems. Taking advantage of our studies, the experimental results demonstrate that in the environment of DTMNs with the presence of disconnected sub-networks, message delivery can benefit greatly from the underlying periodicity within mobile data. In addition, exploiting periodicity opens up new research frontiers in several aspects such as designing novel routing protocols, query dissemination and collection, and preserving privacy and security in environments with the presence of periodic behaviours.