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The scope of this report is to highlight issues that might arise from the london_bicycles dataset and provide recommendations that aim to improve the existing service.

London Bicycles constantly presents cases of empty stations. The problem is not caused by the percentage of empty stations or full docks but by the consistency of the pattern. Both distributions of Empty Stations and Full Stations follow a quasi-bivariate normal distribution, having peaks at 8 am and 5 and 6 pm respectively. (For instance, on Monday, 9th of May 2016, there were 10 empty stations in the afternoon and 63 full stations in the morning, over 781 stations)

Usage follows a bivariate normal distribution, with peaks at 8 am and 6 pm. Taking into example a random data (9 May 2016), there were 4002 active users at 8 am and 2602 at 6 pm. The most popular stations both to start and to end a trip are: Belgrove Street, king's Cross, Hyde Park Corner in Hyde. Park, Waterloo Station 3, in Waterloo.

Belgrove Street serves commute purposes, being close to King's Cross Station, in a central area. The usage increases rapidly from 5 and has a peak at 8, when customers collect bicycles, then starts declining steadily until 10 am. The station has a second peak at 5, when users return bikes to the station. Hyde Park Corner has a steady increase during the weak, reaching a peak at 5 pm, while the usage follows almost a normal curve during the weekend, with a peak at 4 pm. Waterloo Station 3 also serves commute purpose, being close to Waterloo Station and to King's College and follows a similar pattern to Belgrove St.

The most popular trips of all time are Hyde Park Corner-Hyde Park, Black Lion Gate – Kesington Gardens, Albert Gate-Hyde Park, which are leisure trips, but in some of the most popular stations is possible to spot a commute user segment.

With the resolution of boosting customer service quality, london_bicycles is committed to reduce the number of empty and full stations. For this purpose, London_bicycles needs to improve the flow that optimizes stations' capacities. An opportunity lies in establishing partnerships with food delivery companies, so that riders renting the bikes after the evening peak create a second revenue flow for london_bicycles and park the bicycles in more central locations, compared to residential areas where bikes are left in the evening by the customers.
Another way to do so is asking the customers to pick up or dock a bike where there is the most need, by giving monetary incentives, in the form of discounts on the trips. The elevated number of stations allows customers to find a station nearby, where is possible to pick up or park a bike, so that customers who are in a hurry can find a bicycle or park the bicycle at the most convenient location. The service quality can also be enhanced by increasing the number of operators and drivers that move bikes from one station to another during peak hours. These actions create a continuous flow of optimized traffic, that is directed towards the stations that need to be refilled/emptied.

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