AREADUM REPORT

DAMA - UPC

The Effect of Activity Types on Disallowed Repeated Check-ins

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1 Introduction

In the previous report, we detect a user behavior, which is having repeated check-ins in loading/unloading areas. We also proved that this behavior becomes more common everyday.

In this report, we continue to work on this user behavior by consideration of activity types. We analyze the subset data which consists of only disallowed repeated check-ins in Barcelona. The purpose of this section's analyses is that we need to deeply understand the characteristics of activities for deliveries. We check daily distribution of disallowed repeated check-ins for each type of activities, the comparison of days in a week, and the correlations of this disallowed repeated check-ins' distribution with whole data and the data which does not include any disallowed repeated check-ins.

2 Experiments and Results

2.1 Activity Type 1: Obra Civil

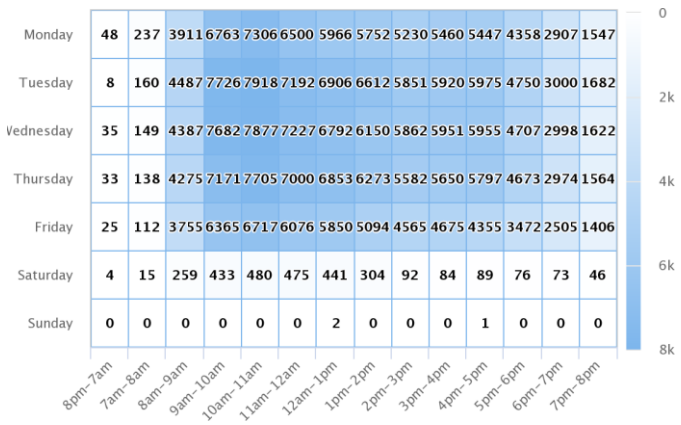

Figure 1: Disallowed Repeated Check-ins Caused by Activity Type 1

In Figure 1, we can see that from 09:00 to 11:00, the frequencies of disallowed repeated check-ins have the greatest values. If we assume that the first disallowed repeated check-in from a user occurs at 09:00, it means that this user's first check-in was around 08:30. The interpretation can be that the users more likely tend to come to the unloading/loading areas and starts to have disallowed repeated check-ins in a consecutive way.

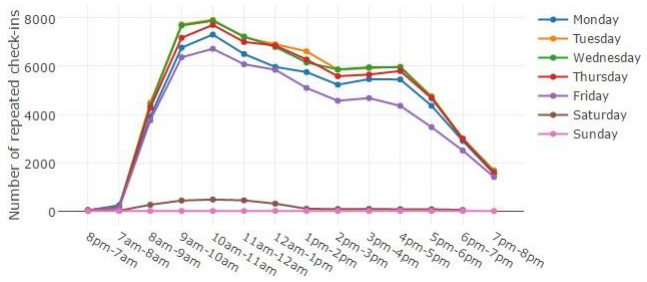

Figure 2: Daily and Hourly Distribution of Disallowed Repeated Check-ins Caused by Activity Type 1

2.2 Activity Type 2: Fusteria

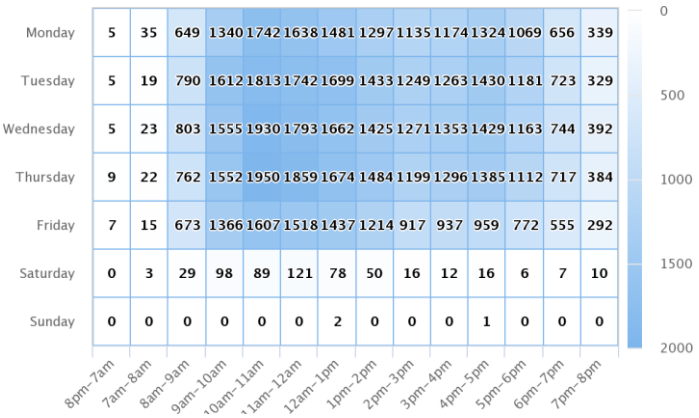

Figure 3: Disallowed Repeated Check-ins Caused by Activity Type 2

In Figure 3, we can see that from 10:00 to 12:00, the frequencies of disallowed repeated check-ins have the greatest values. If we assume that the first

disallowed repeated check-in from a user occurs at 10:00, it means that the user's first check-in was around 09:30. The interpretation can be that the users with Activity 2 come to loading/unloading areas later than the users with Activity 1 in order to occupy the parking lots.

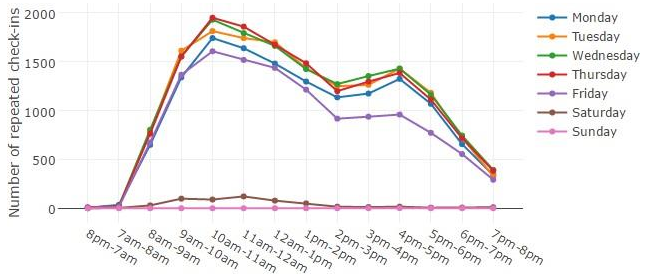

Figure 4: Daily and Hourly Distribution of Disallowed Repeated Check-ins Caused by Activity Type 2

2.3 Activity Type 3: Installacions

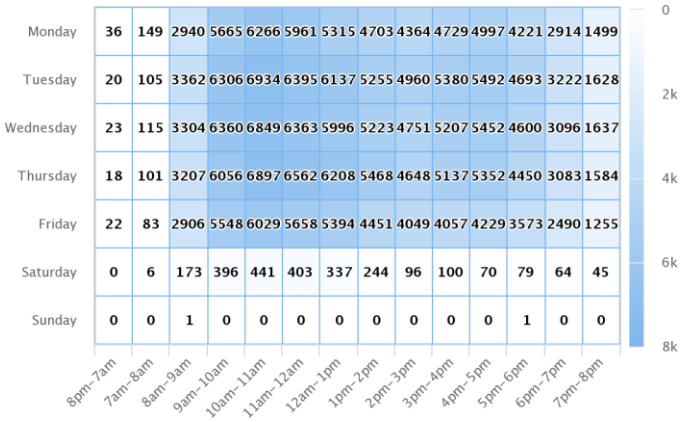

Figure 5: Disallowed Repeated Check-ins Caused by Activity Type 3

In Figure 5, we can see that from 09:00 to 12:00, the frequencies of disallowed repeated check-ins have the greatest values, whereas from 10:00 to 11:00 there is a peak. If we assume that the first disallowed repeated check-in from a user occurs at 09:00, it means that the user's first check-in was around

08:30. The interpretation can be that the users with Activity Type 2 come to loading/unloading areas in early morning and the number of this users keep increasing between 09:30 and 11:00.

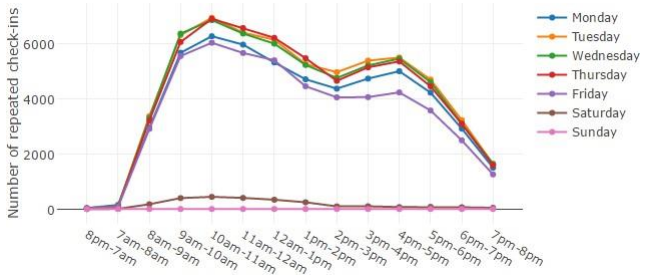

Figure 6: Daily and Hourly Distribution of Disallowed Repeated Check-ins Caused by Activity Type 3

2.4 Activity Type 4: Mobiliari

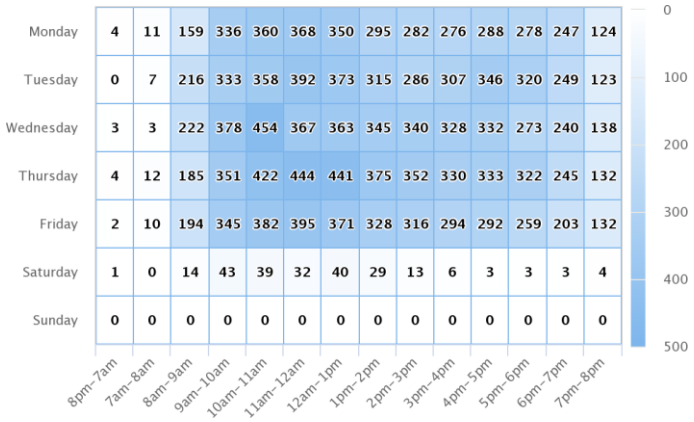

Figure 7: Disallowed Repeated Check-ins Caused by Activity Type 4

In Figure 7, we can see that from 10:00 to 13:00, the frequencies of disallowed repeated check-ins have the greatest values.

Figure 8 has more different distribution than the previous types of activity. For instance,

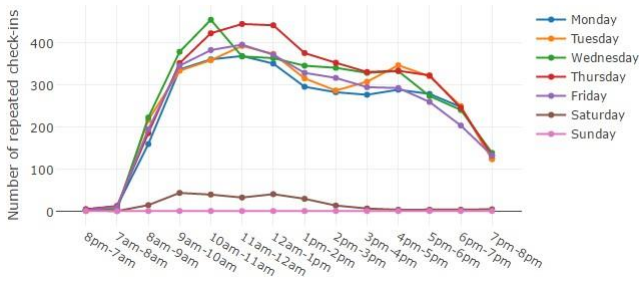

Figure 8: Daily and Hourly Distribution of Disallowed Repeated Check-ins Caused by Activity Type 4

- Wednesday has more disallowed repeated check-ins from 08:00 to 11:00.
- Thursday has more disallowed repeated check-ins from 11:00 to 15:00.
- Tuesday has more disallowed repeated check-ins from 16:00 to 17:00.
- If we ignore two peaks caused by Wednesday 10:00-11am and Tuesday 16:00-17:00, Thursday is the day most frequently chosen day for having disallowed repeated check-ins.

2.5 Activity Type 5: Transport

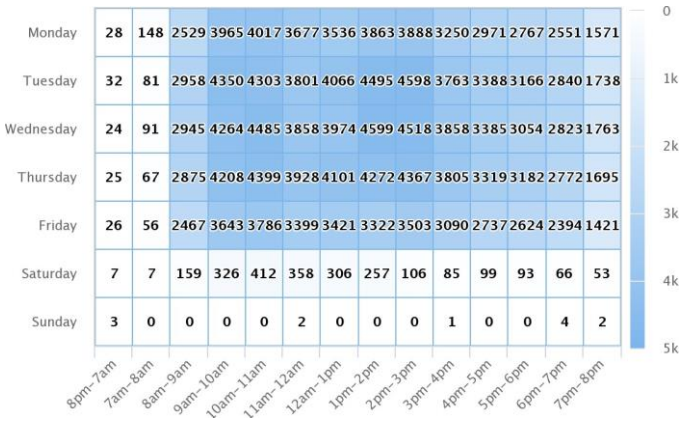

Figure 9: Disallowed Repeated Check-ins Caused by Activity Type 5

In Figure 9, we can see that from 09:00 to 11:00 and from 13:00 to 15:00, the frequencies of disallowed repeated check-ins have the greatest values. This is the type which has two peaks in its daily and hourly distribution. It is quite similar the distribution plot in the previous reports.

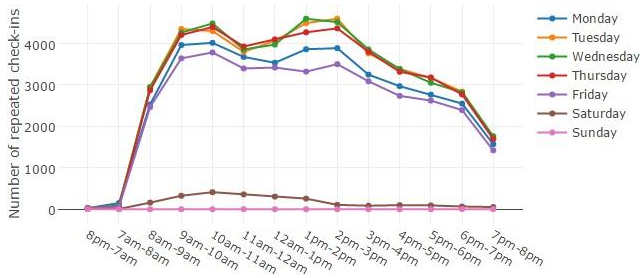

Figure 10: Daily and Hourly Distribution of Disallowed Repeated Check-ins Caused by Activity Type 5

2.6 Activity Type 6: Others

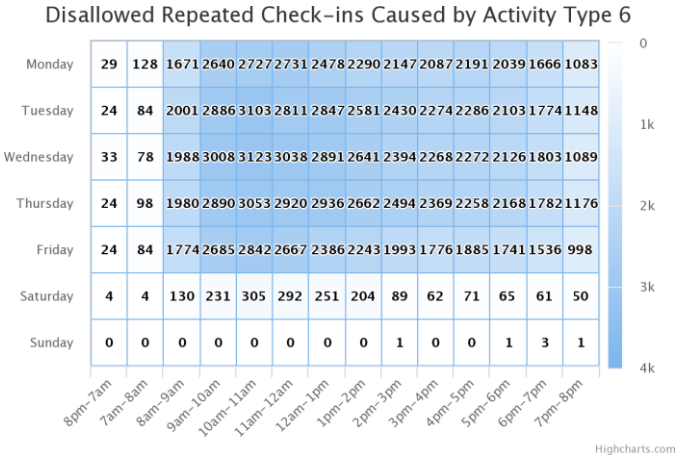

Figure 11: Disallowed Repeated Check-ins Caused by Activity Type 6

In Figure 11, we can see that from 09:00 to 13:00, the frequencies of disallowed repeated check-ins have the greatest values.

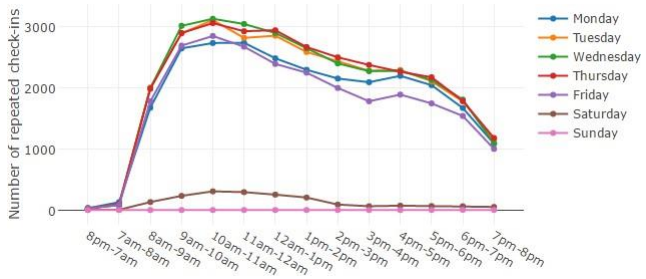

Figure 12: Daily and Hourly Distribution of Disallowed Repeated Check-ins Caused by Activity Type 6

3 Highlights

- Tuesday, Wednesday and Thursday are the days which have the greatest number of disallowed repeated check-ins for all activity types, **but Activity Type 4**.
- The first peak which occurs in the distribution plots for all activity types, **but Activity Type 4**.
- Activity Type 4 has the most complex distribution to interpret since everyday it has totally different trends, peaks at different time period etc.
- Activity Type 5 is the one which has the second peak in a different time period. Second peak in distribution plots generally appears at 16:00, whereas this type's second peak appears from 13:00 to 15.00. It gives the idea to us that Activity Type 5 drivers need to park and leave their vehicle for lunch time.