

## Amsterdam University of Applied Sciences

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## **A tool for monitoring a clean taxi stand in Amsterdam**

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### **Executive Summary**

The city of Amsterdam wants to have an emission free taxi sector by 2025. In order to reach that goal, the city has taken a number of measures which favour clean taxis above conventional taxis. In 2017, as part of this policy, the city of Amsterdam decided to allow only clean taxis at the Leidseplein taxi stand, one of the busiest taxi stands in the city. This taxi stand is characterized by large numbers of passengers within very short periods at social evenings and nights on Thursdays, Fridays and Saturdays. The municipality wanted to know if the number of clean taxis in Amsterdam would be sufficient to handle these high peaks of passengers.

In this study, Amsterdam University of Applied Sciences (AUAS) presents a monitoring tool that was developed to follow the visiting behaviour of clean (electric and green gas vehicles) and regular (diesel) taxis at the Leidseplein taxi stand. The tool served as a basis for the municipality to evaluate the feasibility of making this taxi stand completely clean. As such this tool aims to contribute to a better understanding of the effect of this privilege measure and to provide input for policy makers to introduce privilege schemes to stimulate clean taxis in cities.

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### **1 Introduction**

At present about 1200 clean<sup>1</sup> taxis run in Amsterdam, which is about 33% of the approximately 4000 registered taxis in the city, which mostly run on diesel. Besides these registered taxis, it is roughly estimated that another 3000 legal but not registered, mostly diesel, taxis are present. The diesel taxis emit a disproportionately large amount of hazardous emissions in many short journeys in the city centre. Use of clean taxis is therefore highly desirable for improving air quality. The municipality has agreed with the official taxi organizations in Amsterdam that all taxis be fully emission free by 2025. In order to reach that goal, the city of Amsterdam has committed itself to facilitate clean taxis in the city, especially the electric ones, with a number of measures and incentives. One of the incentives is to admit only clean registered taxis at the Leidseplein taxi stand.

The Leidseplein taxi stand is characterized by large numbers of passengers at social evenings and nights on Thursdays, Fridays and Saturdays. At peak moments between 150 and 200 taxis per hour are required to serve all passengers. Halfway 2017, the number of registered clean taxis was about 440. The question was if the number of registered clean taxis could provide sufficient transportation capacity at these peak times.

Important questions for the municipality relate to whether privilege measures work effectively to nudge the taxi sector towards zero emission trips. The city cooperates with the Amsterdam University of Applied Sciences (AUAS) in the three year research project “Urban Smart Measures and Incentives for the Enhancement of Life” (USMILE) to analyse the effect of the policy measures. Based on recorded taxi data of Leidseplein, AUAS determines the effect on the increased number of electric vehicles, the decrease of the number of conventional vehicles and the behavioural reaction of taxi drivers on the measures. In this

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<sup>1</sup> The municipality of Amsterdam has defined clean as FEV and CNG for the period until 2021.

paper results of the tool will be presented to illustrate how this can help to decide on the feasibility of the measure and to determine the effectiveness of the measure.

## 2 Objectives

Objective of this paper is to present resulting graphs of the monitoring tool which supported the decision of the municipality to allow only clean taxis at the taxi stand at Leidseplein. As from January 8<sup>th</sup> 2018, the Leidseplein taxi stand was only available for registered clean taxis, with an exception period at Saturday and Sunday night from 00:00 to 05:30 hours, when also conventional taxis were allowed. The duration of this exception period was reduced in some steps during the year. For the purpose of this study data on incoming taxis at the taxi stand is available (“gate data”). Analysis of the available data provides opportunities to answer questions about the response of the taxi sector in Amsterdam to this policy measure. Research questions include: what has been the effect of the regulation on the share of clean versus diesel taxis in the various exception periods? What was the effect on the total number of vehicles entering the gate?

## 3 Projected results

Illustrative plots of preliminary data analysis are shown below. Figure 1 shows that the social nights Friday, Saturday and Sunday require large numbers of taxis at the peak hours from approximately 00:00 till 04:00 hours.

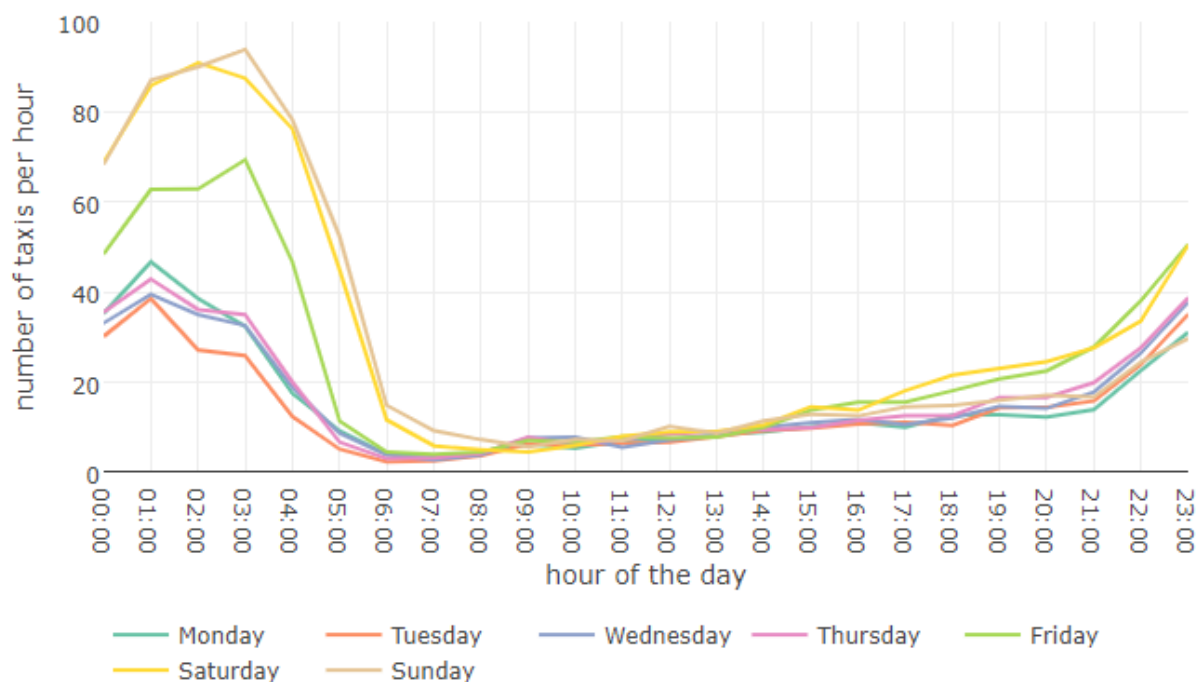


Figure 1 The average number of clean taxis per hour presenting at the gate at the taxi stand Leidseplein for all weekdays in the period January 2018 till August 2018.

Figure 2 to Figure 5 show the number of taxis per hour during the social nights at Leidseplein. Figure 2 shows the numbers in 2018, week 1. In this week no restriction of taxi type was active yet. The number of conventional taxis (in orange) outnumbers the clean taxis (in blue).

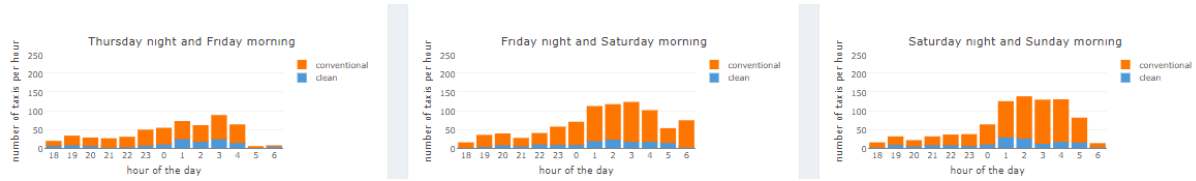


Figure 2 The number of clean taxis (blue) and conventional taxis (orange) per hour presenting before the gate at Friday, Saturday and Sunday nights. Week 1, 2018: clean and conventional taxis both allowed at the taxi stand.

Figure 3 shows week 2, when the measure to allow only clean taxis became active, with an exception for the period from 00:00 – 05:30 hours on Saturday night and Sunday night. In this exception period the number of conventional taxis still outnumbers the clean taxis. The figures show that some conventional taxis still present themselves before the gate outside the exception period, although the municipality had clearly communicated that no entrance would be allowed.

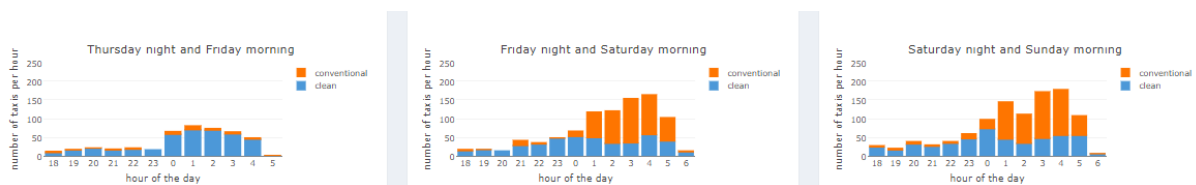


Figure 3 The number of clean taxis (blue) and conventional taxis (orange) per hour presenting before the gate at Friday, Saturday and Sunday nights. Week 2, 2018: conventional taxis only allowed on Saturday and Sunday night allowed at the taxi stand from 01:00 – 05:30 hours.

Figure 4 shows week 15, when only clean taxis were allowed, with exception for the shortened exception period from 03:00 – 05:00 on Saturday night and Sunday night. In this exception period the number of clean taxis is larger than the number of conventional taxis. Some conventional taxis still present themselves before the gate outside the exception period.

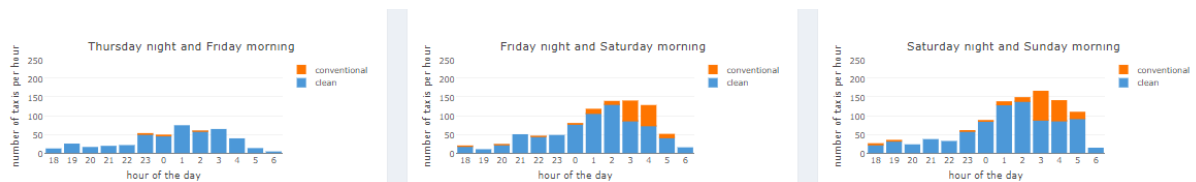


Figure 4 The number of clean taxis (blue) and conventional taxis (conventional) per hour presenting before the gate at Friday, Saturday and Sunday nights. Week 15, 2018: conventional taxis only allowed on Saturday and Sunday night allowed at the taxi stand from 03:00 – 05:00 hours.

Figure 5 shows week 30, when only clean taxis were allowed, with no exception period anymore. No conventional taxis present themselves before the gate outside the exception period.

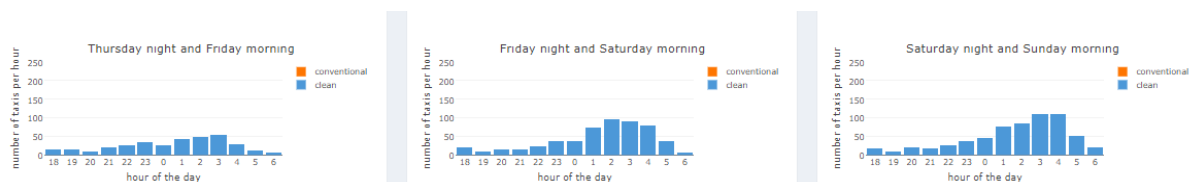


Figure 5 The number of clean taxis (blue) and conventional taxis (orange) per hour presenting before the gate at Friday, Saturday and Sunday nights. Week 30, 2018: only clean taxis allowed.

## **4 Expected results and conclusions**

Based on the results that were produced so far, the following preliminary conclusions can be drawn and will be presented in more detail in the paper:

- monitoring proves to be important for evaluating and adapting policies and supporting the timing of policy decisions;
- the measurements show how this innovative policy measure has enabled this taxi stand to become clean;

The analysis provides important input for authorities when implementing clean mobility policies. Furthermore, for academics this case provides interesting insights in the reaction of the taxi sector to an innovative policy scheme.

### **Authors**

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