

# THESIS AWARD - LUSTRUM BOOK

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# LESSONS FROM POLICY IMPLEMENTATION

## Student information

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## Mobility management at Erasmus University Rotterdam: lessons learnt from policy implementation and how to move forward

This thesis evaluates the mobility management policy that was put in place by the Erasmus University Rotterdam (EUR) in 2011. The goal of the policy was to see a reduction in car commuters in order to become a more sustainable campus.

Several policies were put in place. This thesis gives special attention to the introduction of parking charges since June 2013. The analysis is based on three years of data, which is provided by the EUR via surveys in 2010, 2014 and 2016.

The statistical analyses find four factors that predict car commuting:

- | car availability,
- | arrival time,
- | type of function of the employee and
- | number of days one commutes per week.

The perceived accessibility has decreased since 2010, and there has been a reduction of car commuters by 6.80% points. The introduction of parking fees shows a decrease in car commuting. Furthermore, an estimation of the reduction in CO<sub>2</sub> is made, which finds a total daily reduction of 1137.8 kg CO<sub>2</sub> in 2016 compared to 2010.

The results suggest that the EUR is well on its way to realise their aim in reduction of employee commuting, and that future policy measures are likely to be found in behavioural as opposed to parking measures. Overall, the EUR has become a more sustainable campus since 2010.



# SMART MOBILITY: A STRATEGIC SOLUTION

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## Smart mobility: a strategic solution in urban development

Shared and autonomous vehicles provide municipalities with a strategic solution in urban development. Smart mobility can be a game changer in realising the ambitions of a safe, liveable, sustainable, and attractive city.

### Consider spatial implications of smart mobility

Former policies on mobility however have resulted in long term undesirable effects. This increases the urgency for municipalities to already consider the spatial implications of smart mobility. A lot of research has been carried out already on the effects of smart mobility, but these focus only on first order local effects.

To the best of the authors knowledge, no literature exists on how, where and if the effects of smart mobility can be used for the restructuring and transformation challenges of the public space.

The main question of this research is:

“To what extent can autonomous and shared mobility contribute to the restructuring and transformation of the public space and help to achieve a region’s public ambitions, taking into account the different mobility scenarios?”

To answer the research question, both a quantitative and qualitative approach were used. First a conceptual model was developed using existing literature and findings out of the expert interviews. Secondly, the

conceptual model was used to develop a mathematic model in the programming language Python.

The Python model helped to analyse several large datasets for the different scenarios. Subsequently, the Python output was visualised in Tableau. Tableau helped to analyse and discuss the different research questions.

### Reduction of parking capacity

It was found that smart mobility can, depending on the scenario, result in a reduction of parking capacity between 0% and 88%. This bandwidth depends on the market share of shared and autonomous mobility, as well as on the change in extra kilometres travelled, the replacement ratio of shared vehicles, and the reduction of the parking footprint per scenario.

The reduction in parking capacity results in freed up space, which can be transformed into a new function and contribute to the restructuring and transformation of the public space.

How and to what extent smart mobility can contribute depends on the location and type of parking, the dynamics of the housing stock, and the policy of the government.

In urban areas with a dynamic housing stock and a relatively large capacity of the different types of parking, smart mobility can contribute the most to both the development of new houses and the improvement of the public space.

It can furthermore help to increase the housing density in urban areas, which has a beneficial effect on car use.

In more rural areas, where the housing dynamic is lower and where mostly street parking is available, smart mobility can only contribute to the improvement of the public space and the attractiveness of the region.

Smart mobility has shown to have an indirect effect on the economic, health, social, environmental, and ecological spatial value.