Master Thesis

Life Cycle Cost Calculation of a Light Rail Track focusing on the maintenance phase: Case study U3 line in Stuttgart

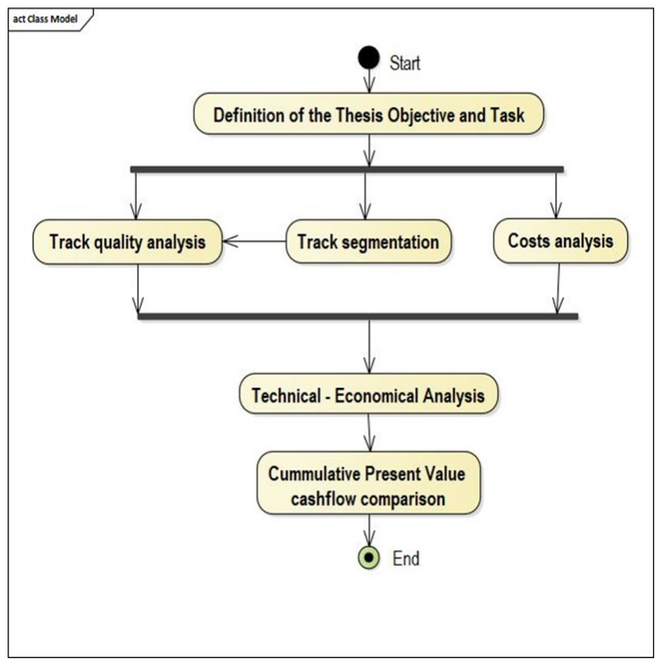
Along the history, the improvements related to the maintenance for every infrastructure have been developed to achieve different targets according the situations that the world faced at each moment. The continuous usage of resources and the environmental impact that the industry generates, lead us to consider the possibility of a better distribution of the same resources to achieve a longer and more accurate lasting of the infrastructure, considering the materials lifetime and the safety and comfortability experienced by the passengers.

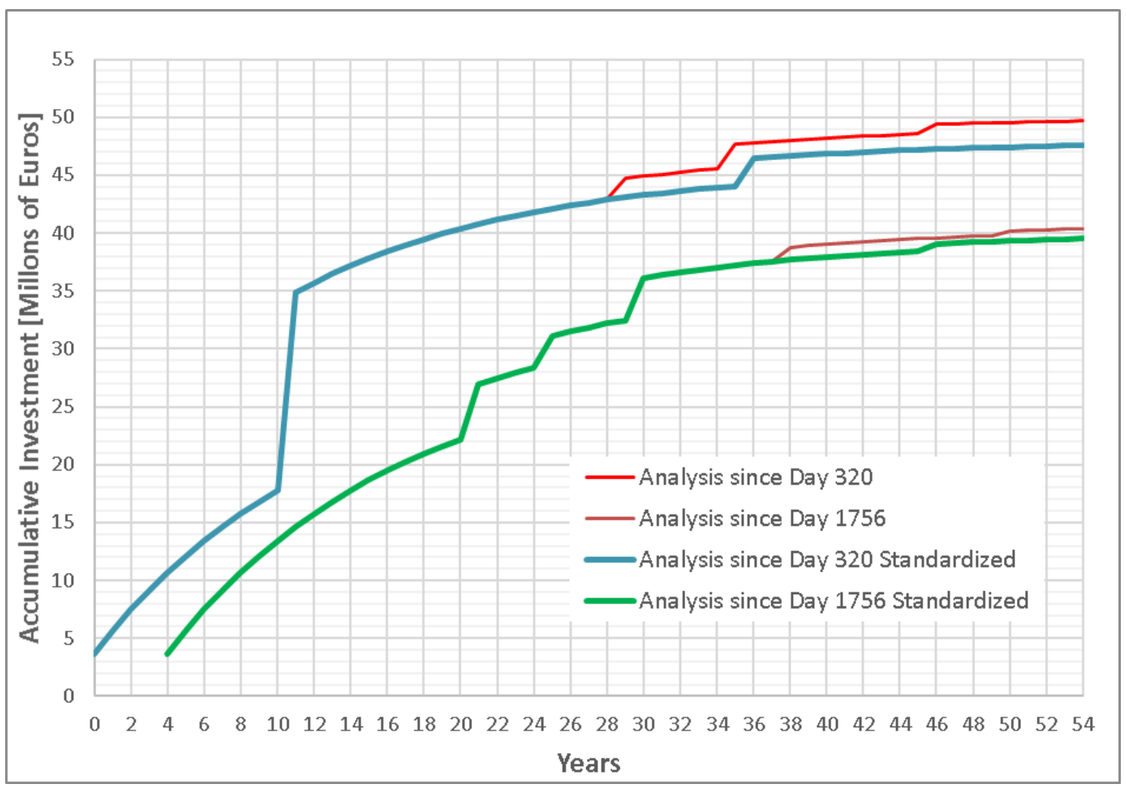
Luis Gustavo Morales

This Master thesis comprises a Life Cycle Cost Analysis to execute a comparison of different options regarding the most accurate timing for a renewal process to be placed, defining as track quality parameter the acceleration experienced by the train directly linked to the comfort of the passengers .

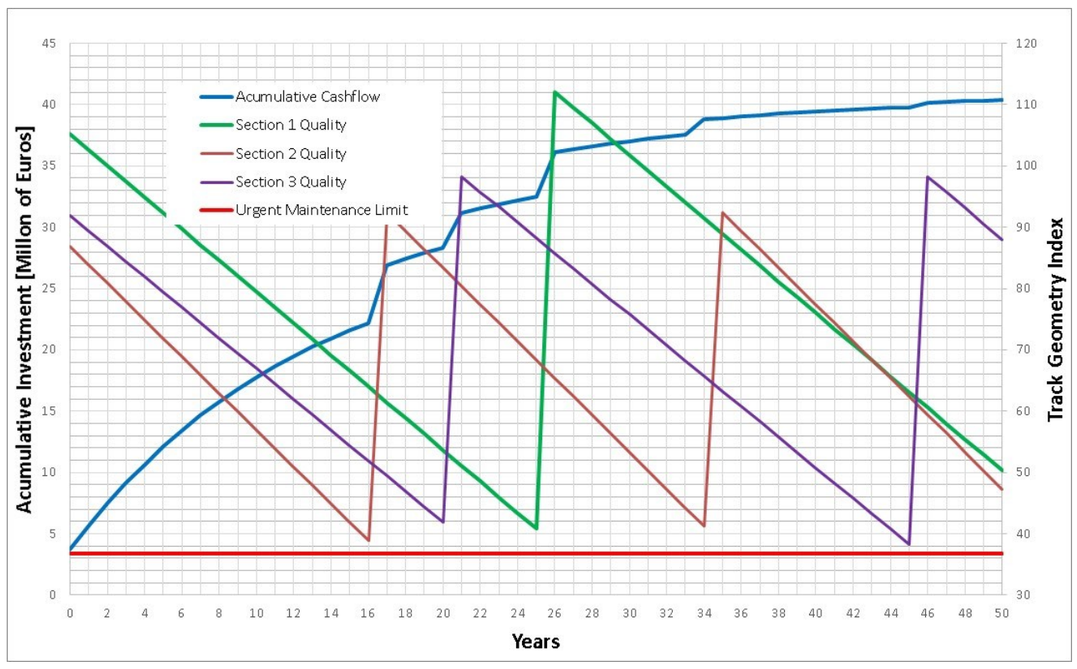
The junction of the quality of the railway, related to the comfortability of the passenger, with the feasibility of the project, related to the project's economic success, makes this study an interesting tool for future developments, always keeping in mind the particular characteristics of each project.

The result will lay on the analysis of different options where the times of action for the activities, and the behaviors of the cashflows would be modified in each case. The analysis in the end would deliver convenient options and room for future discussions about the scheduling of the activities and the costs for each option.





	Deterioration Equation	R^2	Deterioration Rate [TGI/Year]
Section 1	y=-2.58x+116.95	0.2338	2.58
Section 2	y=-3.00x+82.29	0.1598	3.00
Section 3	y=-2.5x+69.05	0.3311	2.5



Master thesis of Luis Gustavo Morales
Examiner: Prof. Dr.-Ing. Ullrich Martin
Second examiner: Prof. Dr.-Ing. Markus Friedrich
Supervisor: MSc. David Camacho Alcocer

Institut für Eisenbahn- und Verkehrswesen

E-2018/18

Universität Stuttgart

Keywords: Track geometry index, Deterioration trend, Costs analysis, LCCA, data treatment, Technical—economic analysis, present value, track segmentation.