

# THE “INVISIBLE” WORLD HERITAGE

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# THE CHALLENGE

The purpose of this project is to make some part of the UNESCO World Heritage in Karlskrona more visible for both citizens and tourists. This project aims to make people aware of the culture that can be seen around Karlskrona in a way that will also benefit the incoming tourists and therefore put Karlskrona on a “world map”.

# INITIAL CONCEPTS

The process :

- Projection on buildings
- Water projection
- Map APP



# WE FOCUSED TO WORK ON...

Water projection, why?

- Poll at University
- Uniqueness
- Access to water
- Beautiful site
- Winter/ dark times



# DIFFERENT TYPES OF WATER PROJECTION



Hydroshield  
projection



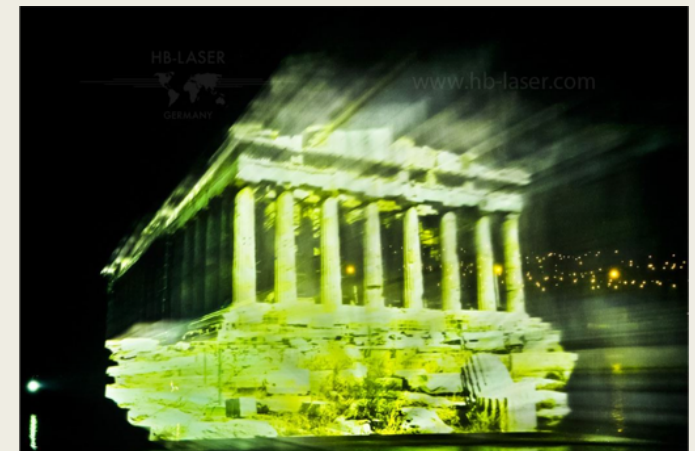
Water curtain



3D water  
model  
projection

# HYDROSHIELD PROJECTION

- Fountain like-shape
- Only one jet is needed
- Pic: from Olympic Games 2004
- Estimated installation time on existing fountain: 3h
- Cost (projector excluded): 10x27m hydroshield with pumps; 40 448 €



# WATER CURTAIN PROJECTION

- Mobile solution
- Environmentally friendly
- Modular
- Installation time: 30 mins (with solution in place)
- Cost (projector not included):  
21 315 €







## 3D-MODEL PROJECTION

- Pic on the left: Amsterdam Light Festival 2014
- Two waterscreens that are intersecting
- Event

# WINNING SOLUTION: 3D - MODEL PROJECTION

## ✓ PRO:

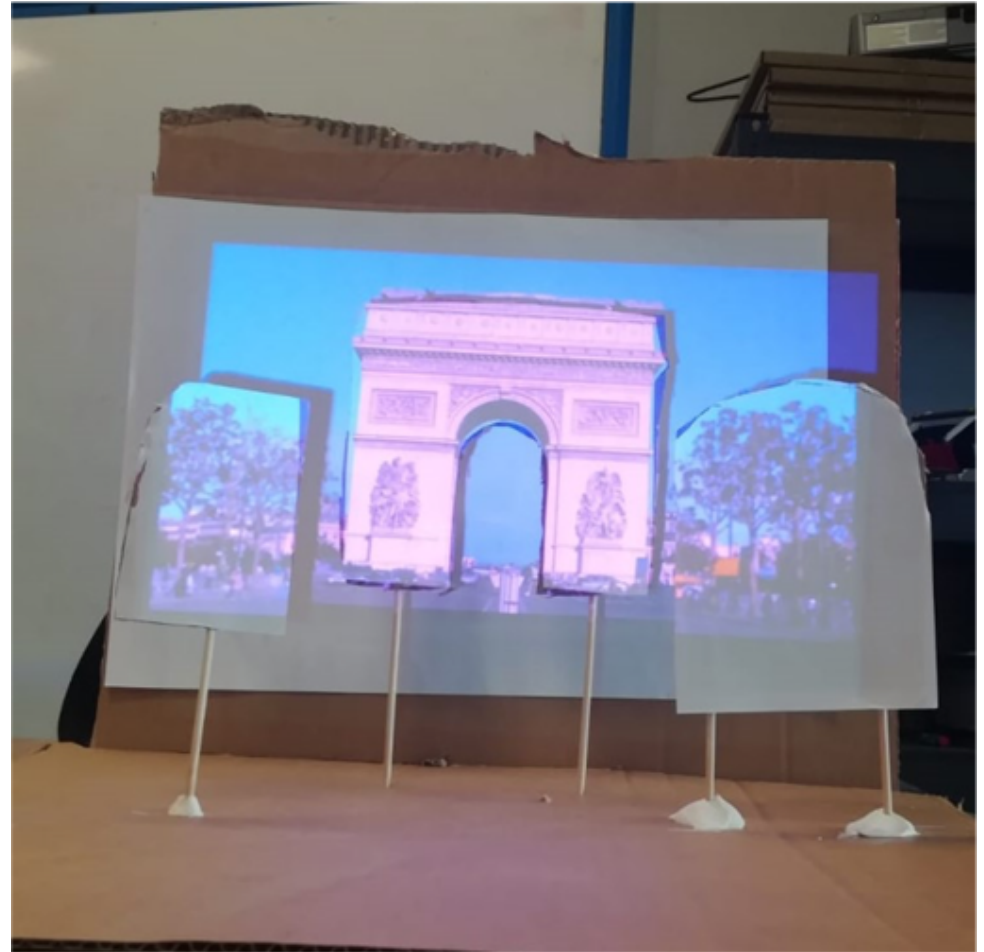
- Most interesting solution
- Innovative
- Beautiful to see

## ✗ CONS:

- Expensive
- Difficult to realize

# FIRST PReTOTYPE

**Aim:** to demonstrate the possibility to realize a kind of 3D projection by projecting 2d images on different levels of material.





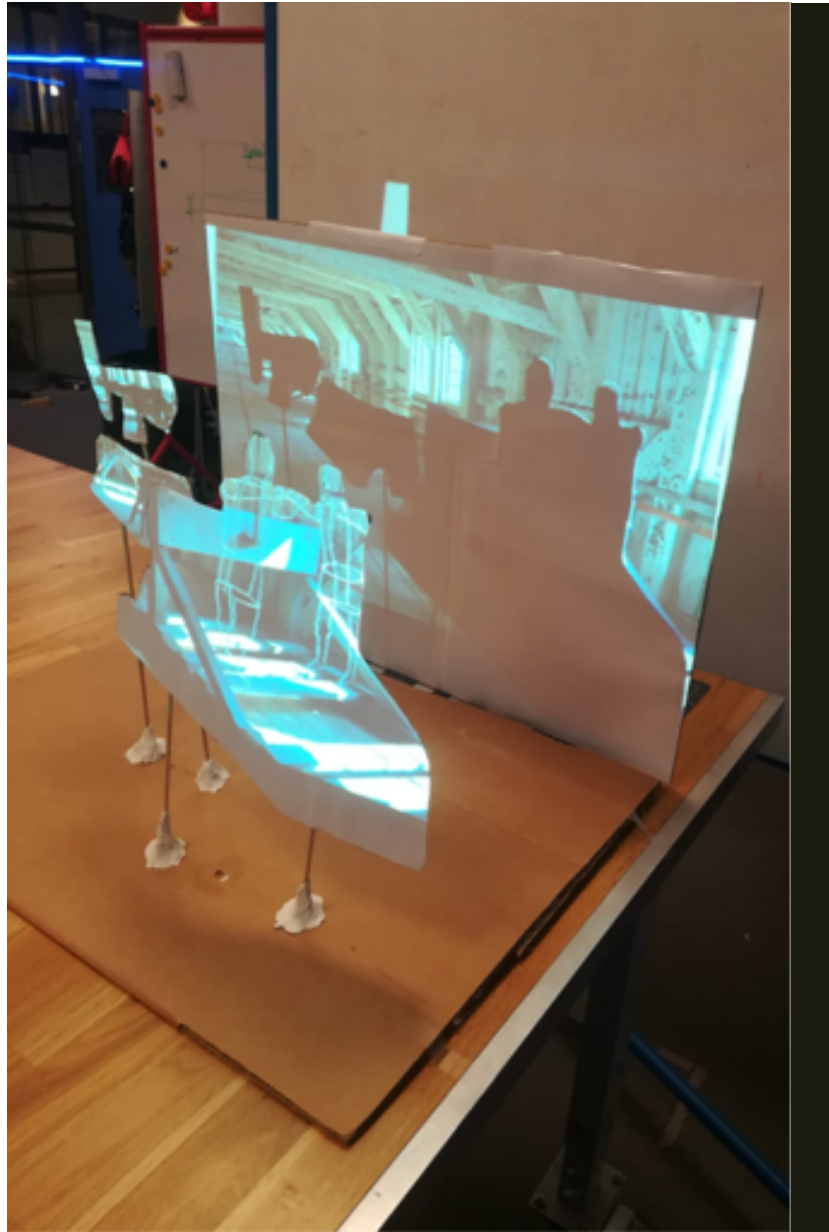
**Material used:** sheets of paper stuck on the cardboard; they do not reproduce the effect of the water jets, but only the feeling of depth.

**Subject:** *Arc De Triomphe*. Very simple subject: only used as an example

# FIRST PRoTOTYPE

**Aim:** to demonstrate the possibility to realize the 3D projection using more complex images.



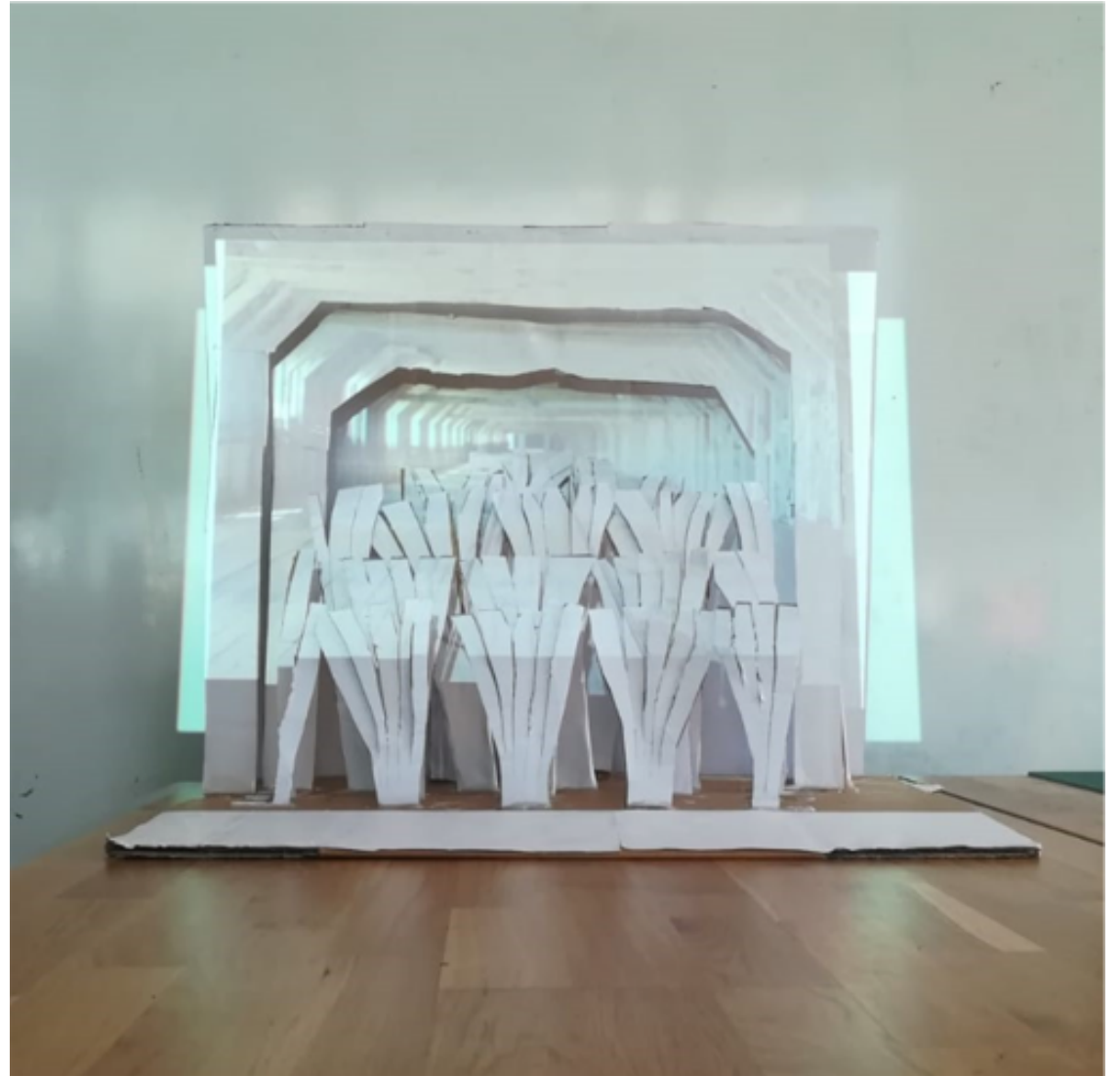


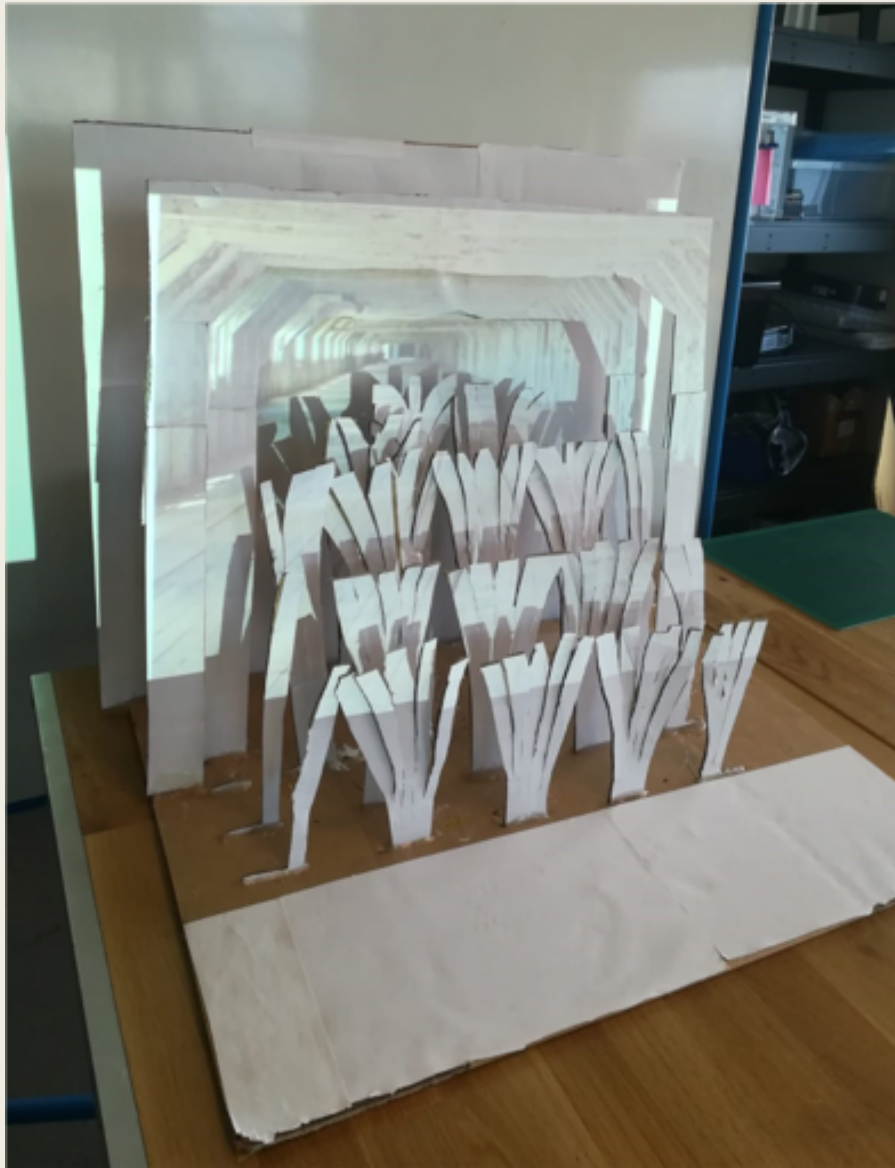
**Material used:** sheets of paper stuck on the cardboard; The effect of the water jets is still missing.

**Subject:** *Ropewalk.*

# FINAL PROTOTYPE

**Aim:** to demonstrate the possibility to realize the 3D projection on water jets.





**Material used:** strips of paper stuck on the cardboard; they are supposed to reproduce the water jets coming from the sea.

**Subject:** *Ropewalk* again, but different picture. Bigger feeling of depth.



# Difficulties and problems

The biggest difficulties in the realization of this prototype (and real model) are related to:

- Lights and shadows
- Position of the tourists



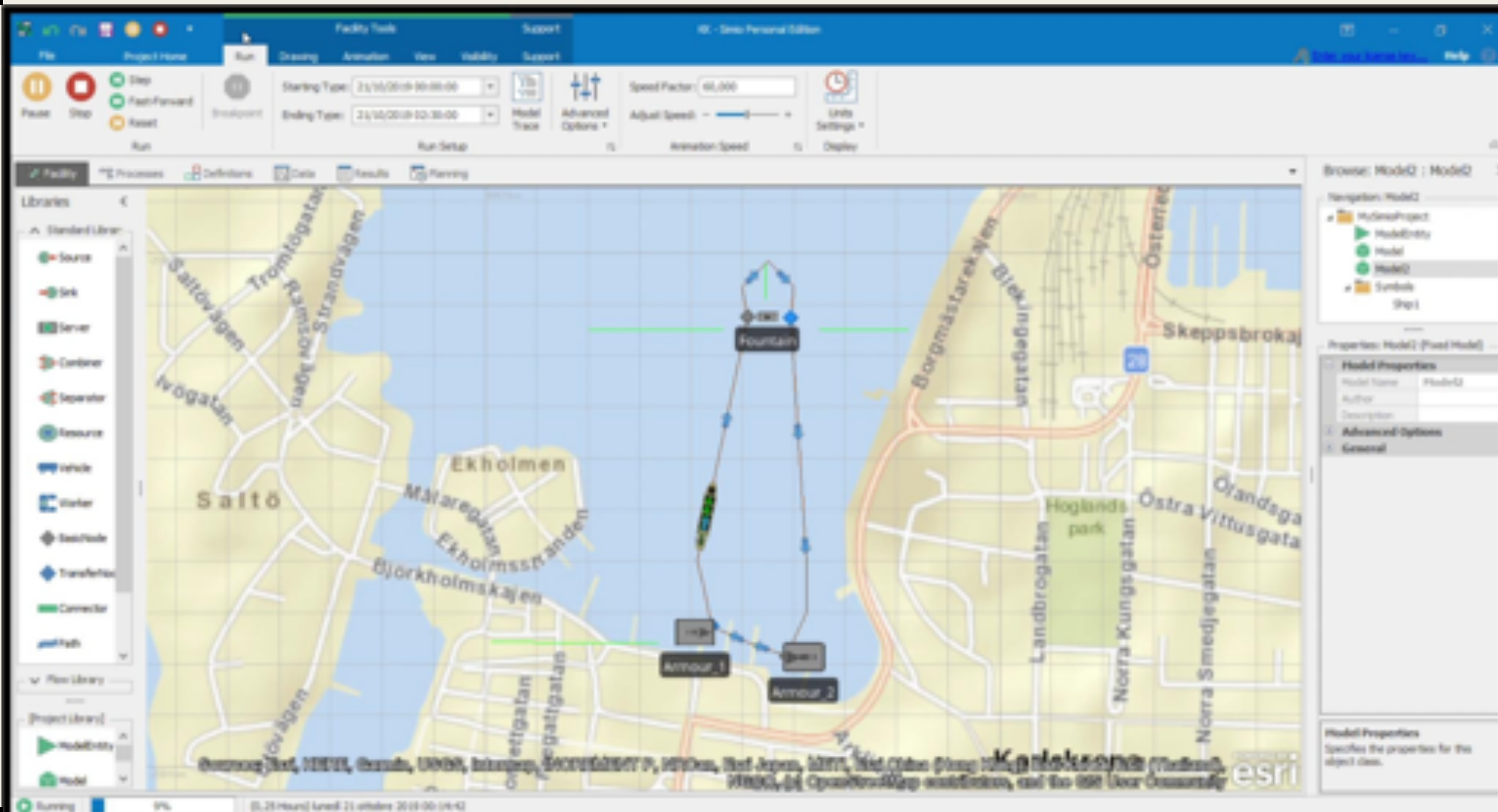


**Context:** 4 nozzles of the 3D fountain got broken and we need to substitute all of them.

**Objective:** calculate the total repair time, considering that these are transported to the fountain from Scandic in Trossö.

**Data:**

- Initial Number entities: 4
- Maximum arrivals: 4
- Load time (seconds): 130
- Unload time (seconds): 150
- Initial desired speed (km/h): 3
- Processing time (min):  
random.triangular(18,20,29)



# RESULTS

The most important result is the average time used to repair the nozzles.

ModelEntity	Nozzle	[Population]	Content	NumberInSystem	Average	3,6043
					Maximum	4,0000
			FlowTime	TimeInSystem	Average (Hours)	2,2527
					Maximum (Hours)	2,3121
					Minimum (Hours)	2,1929
					Observations	4,0000
			Throughput	NumberCreated	Total	4,0000
				NumberDestroyed	Total	4,0000

# COST ANALYSIS



- Purchasing cost for 3D projectors: 2 projectors - 6600 € (~70 780 SEK)
- Maintenance cost calculated with help of SIMIO simulation: 10 000 SEK/year
- Rest of the costs are in investigation process
- Installation time: ~ 6h



Lastly....





**THANK YOU FOR  
LISTENING**