

# Game Design Document

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## 1 Overview

### 1.1 Introduction

Genre: Simulation

Setting: Wheelchair in a city

Perspective: First Person

Objectives: Small missions, physics elements

Main-Feature: Wheelchair

Engine: Unity

### 1.2 Description

Target audience: All age groups allowed to use VR (from 13 years old)

Genre: First-Person Sandbox-Simulation

Art: Low Poly, 3D, Cartoon

Sound: Arcade, Bass

Setting: City

Story: Insight into the life of a totally normal wheelchair user

Target Platform: (PC with VR), Standalone VR

### 1.3 Project Scope

Goals: Wheelchair has to move, basic physics, objectives

Feature Ideas: see mechanics

Current status: concept phase

## **2 Gameplay Plan**

Characters: NPCs

Core Mechanics: Driving with a wheelchair

Player Controls: Controller, if possible: integrate chair (e.g. rotation)

Camera: first person

Secondary mechanics: Powerups: e.g. jet propulsion, interactions with the environment, objectives

Nice to have mechanics: upgrade system, shop, points for certain things

UI: To start

City, objectives, low-poly

## **3 Changes and Rationale**

### **3.1 Scope Change**

The initial plan to integrate VR with a chair with integrated Bass-Pump into the game has been removed from the project scope. This feature, which was a significant component of the original design, is no longer part of our development goals.

### **3.2 Reason for Change**

The change occurred due to the departure of a key team member who was responsible for the development and implementation of the chair with integrated Bass-Pump feature. Without this expertise and resource, we are unable to proceed with this aspect of the project. Consequently, we have refocused our efforts on delivering a high-quality gaming experience using traditional control methods. This adjustment allows us to continue progressing toward our project goals with the current team's expertise and resources.

## 4 Implemented Features

### 4.1 Pointsystem

Players can get points by performing certain actions. This points will be displayed in the UI with a message related to this action.

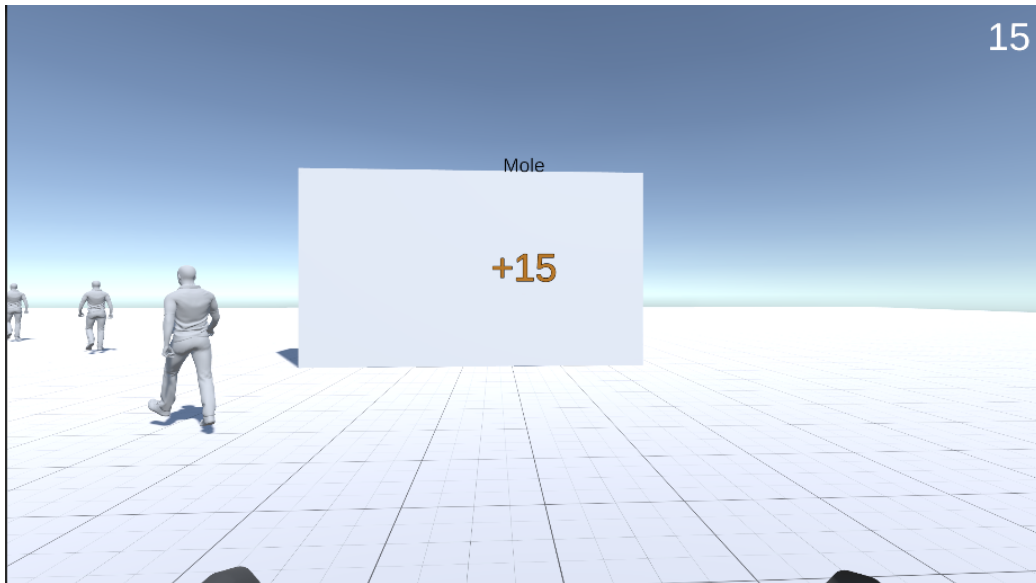


Figure 1: Point System

#### 4.1.1 Pointsystem in VR

Points will no longer be displayed continuously, as this was perceived as distracting during testing. Instead, points can now be found in the shop. Notifications of newly earned points will still appear centered in the player's field of view.

### 4.2 Shop

There is a shop where players can spend their points in exchange for Wheelchair-Upgrades.

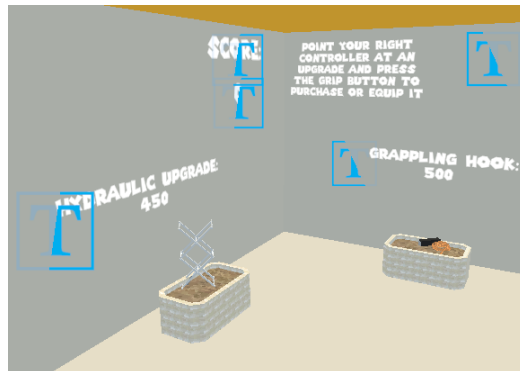


Figure 2: Shop

### 4.3 Grappling Hook

The Grappling Hook is one of the Upgrades the player can buy. It can be used to grapple to higher areas.

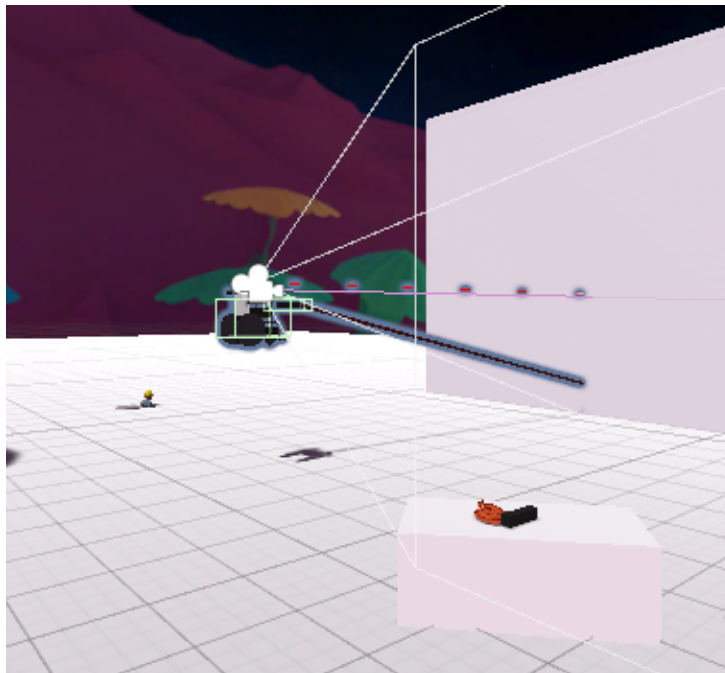


Figure 3: Grappling Hook

## 4.4 Hydraulic Upgrade

The Hydraulic Upgrade allows the player to modify the height of the wheelchair.

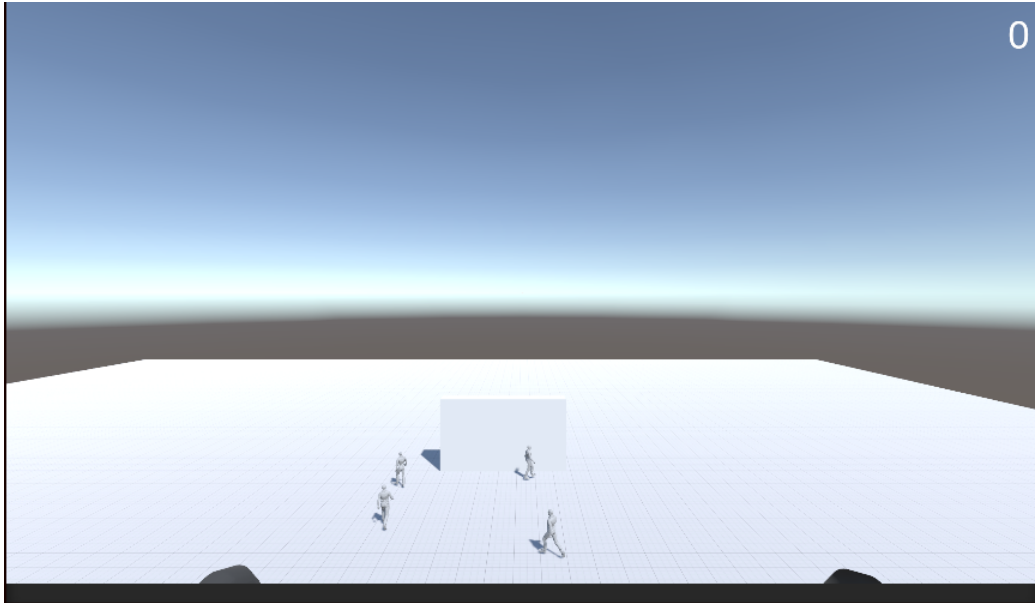


Figure 4: Hydraulic Upgrade

## 4.5 Explosive Barrels

Explosive Barrels explode on contact and give points based on the number of hit NPCs.



Figure 5: Explosive Barrels

## 4.6 Trampoline

The player can jump on trampolines to master difficult parcours.

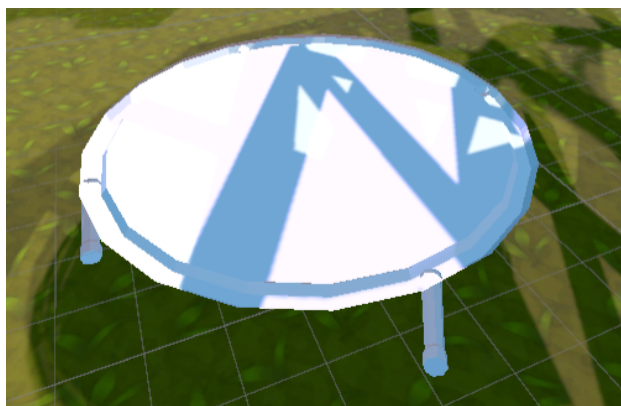


Figure 6: Trampoline

## 4.7 NPCs

NPCs are walking around the city. The player can hit NPCs to get points. These NPCs are ragdolls reacting physically accurate on contact.



Figure 7: NPCs

## 4.8 NPC Spawner

There are several NPC Spawners placed around the city, allowing many NPCs to roam the map simultaneously.



Figure 8: NPC Spawner

## 4.9 Manholes

Players can provoke Hit-and-Run accidents on innocent construction workers for some extra points.



Figure 9: Manhole

## 4.10 Environmental Props

Cars, benches, or traffic signs are pushed away upon contact with the wheelchair.



## 4.11 Hydrants

Players can collide with Hydrants, which will bounce them in the air and leave the hydrant spraying water.



Figure 10: Hydrant

## 4.12 Trash cans

Players can collide with trash cans. This will cover their screen in trash for a few seconds.

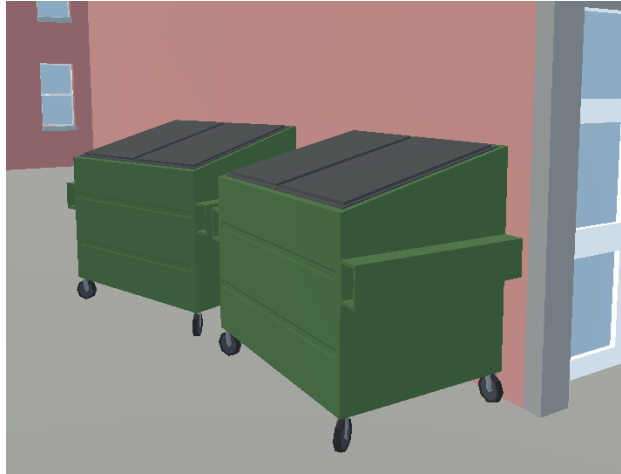


Figure 11: Trash cans

### 4.13 The Portal

Players can find 4 Buttons, which are scattered around the map. Pressing all of these Buttons will result in the Portal activating. Entering the Portal will teleport the Player to the surreal city map (as seen in Figure 13).



Figure 12: The portal

## 5 Level design



Figure 13: City map

## 5.1 Inspiration and Concept

### Surrealism

- Definition: An art movement focused on dream-like, bizarre, and illogical scenes that challenge reality.
- Examples: René Magritte's "The Treachery of Images" (depicts a pipe with the caption "This is not a pipe")



Figure 14: "This is not a pipe"

Salvador Dalí's "The Temptation of St. Anthony" (features fantastical, elongated creatures in a desert landscape)



Figure 15: "The Temptation of St. Anthony"

## Goat Simulator

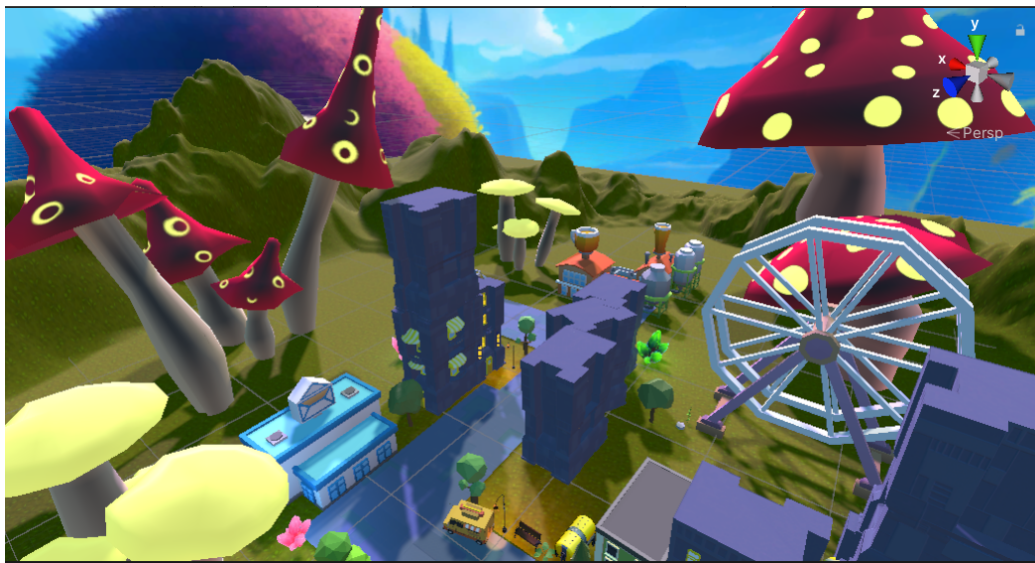
- Known for its unconventional gameplay and humorous, unexpected events.



## 5.2 Surreal Level Design

### Concept

- A blend of surrealist art and the whimsical nature of "Goat Simulator."
- Features an environment with gigantic mushrooms and impossible events.



## **5.3 Key Features**

### **Gigantic Mushrooms**

- Create a whimsical and challenging landscape.

### **Defiance of Physics**

- Objects and structures behave unpredictably.
- Gravity and logic are often disregarded.

### **Humorous Elements**

- Inspired by "Goat Simulator."
- Includes humorous and absurd events.

## **5.4 Objectives and Player Experience**

### **Primary Objective**

- Encourage exploration and interaction with bizarre and unexpected elements.

### **Player Experience**

- Provide a unique and memorable experience.
- Combine mind-bending visuals of surrealist art with playful unpredictability.
- Ensure each playthrough is distinct and enjoyable.

## **6 Sound**

### **6.1 Overview**

The audio elements will include city sounds, interactive feedback, and thematic music to support the atmosphere.

*All sounds used during the development were taken from free open resources such that: freesound.org.*

### **6.2 Soundtrack**

The game features an arcade-style soundtrack.

### **6.3 Sound Effects**

- Interactions: Sound effects will accompany player interactions with objects, such as the sound of explosion, jumping, etc.
- Powerups: Each powerup will have a distinctive sound effect to signal its activation.

### **6.4 Audio Integration**

The game uses a programmed audio manager.

## 7 Technical details

Engine: Unity

**Disclaimer:** The following information is outdated as it is based on an early planning phase. The setup in the final version of the game requires only a VR headset, a chair with wheels (without a bass pump, as it merely allows the player to rotate in the direction they are looking without having to turn their head), and a PC to run the game.

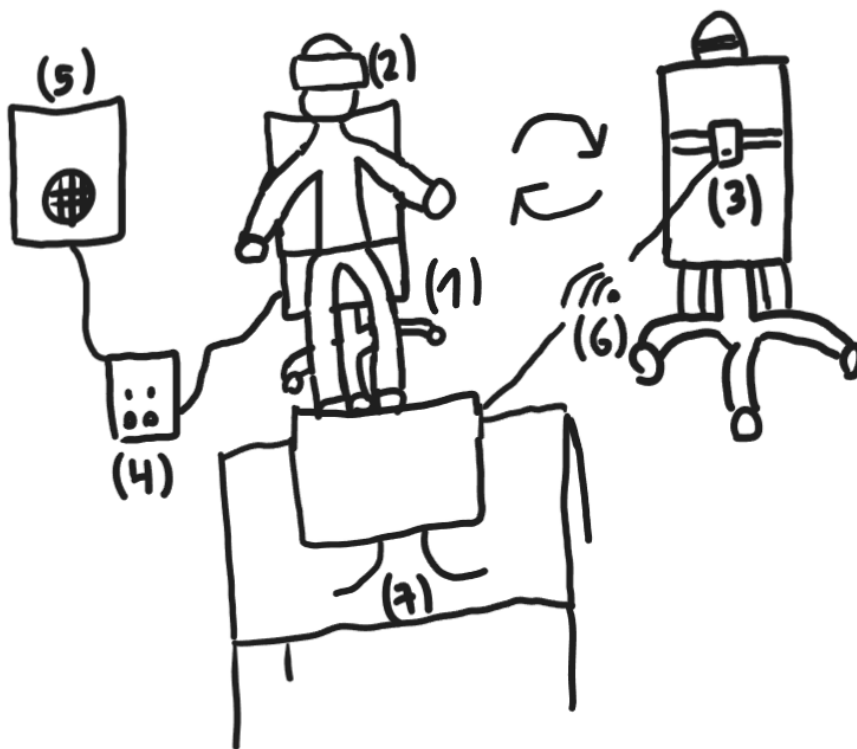


Figure 16: General hardware structure

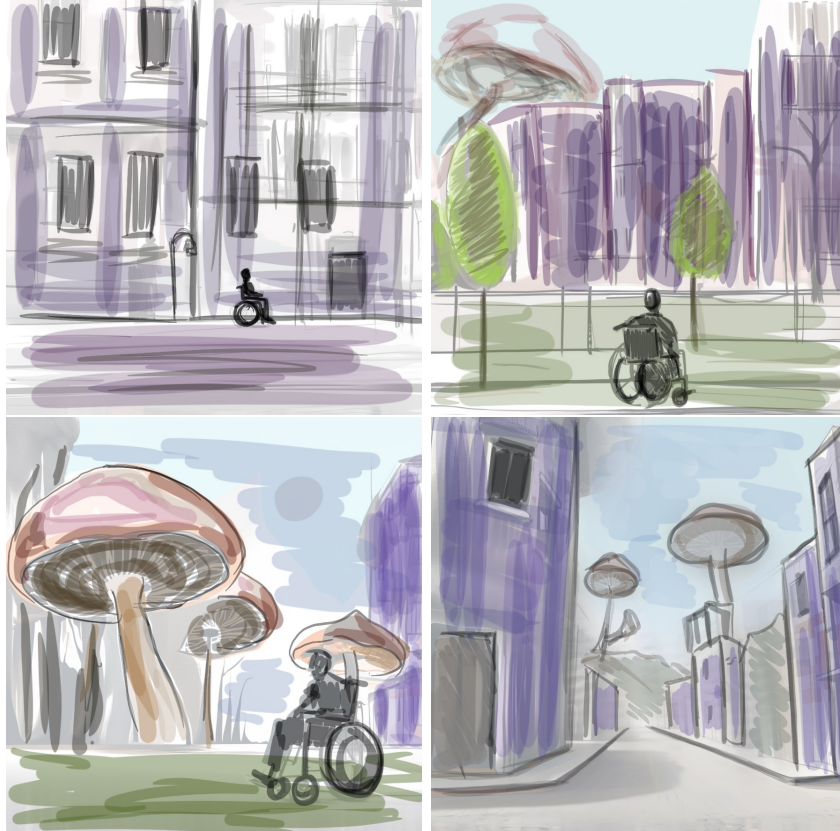
1. Chair with integrated Bass-Pump (*removed*)
2. VR-Headset
3. Chair connected to mobile phone to calculate orientation (*removed*)
4. SQ-Amplifier (*removed*)



5. Sound system (*removed*)
6. Wireless connection between mobile phone and PC to transmit orientation
7. PC to execute the game

## 8 Game Art

### 8.1 Sketches



## 8.2 Environment Design

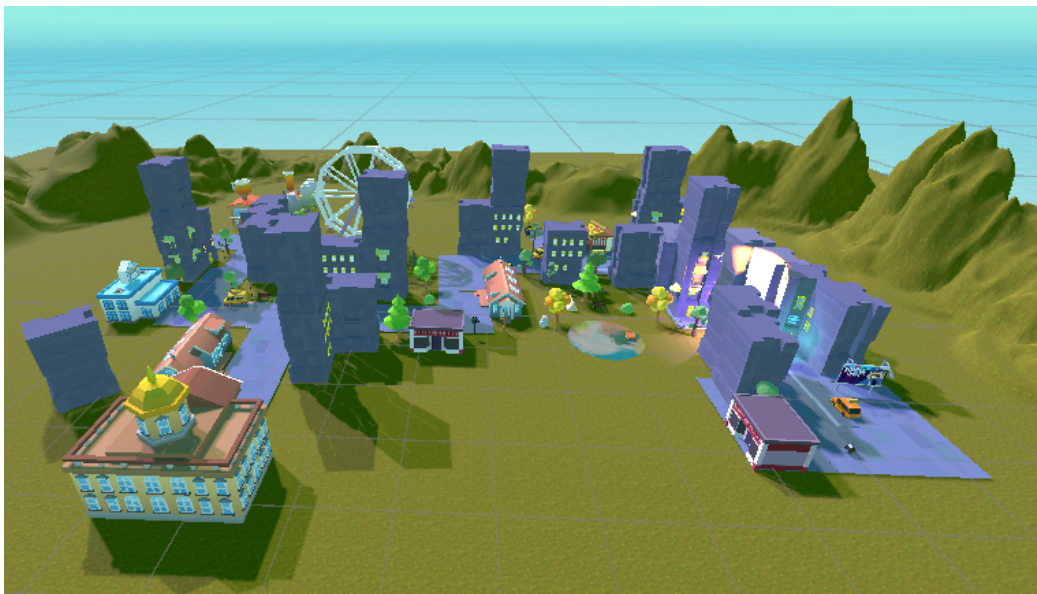


Figure 17: City

## 9 Mapdesign

### 9.1 A new approach

Due to the high speed of the game and the resulting high speed of the wheelchair, a new map had to be developed that offers the player longer linear paths as well as more space for interaction with the game world. The new world is bounded by a sea that resets the player to their starting position upon entering. The city remains divided into various areas to aid the player's navigation. The areas are as follows: Low Residential Area, Medium Residential Area, High Residential Area, Park, Commercial Area, Industrial Area, and a stadium as a landmark. The level design follows a strictly planned scheme developed in advance (Figure 18).

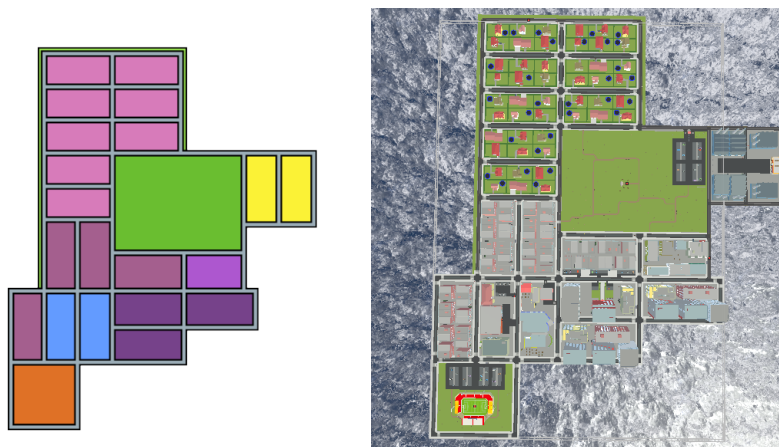


Figure 18: City Plan

Different areas have distinct features; for instance, trampolines are integrated into the Low Residential Area, while manholes are primarily found in the Medium Residential Area (Figure 19).



Figure 19: Distinct Features

## 10 Assets needed

### 3D Assets

- Wheelchair
- Roads
- Houses
- Buildings
- Obstacles

### Sounds

- Background music
- Wheelchair moving sound
- Environment sounds

### UI

- Main screen
- Pause button