

# Realistic Car Controller

First, thank you for purchasing and using Realistic Car Controller!

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You can find more updated details on

<http://www.bonecrackergames.com/realistic-car-controller>

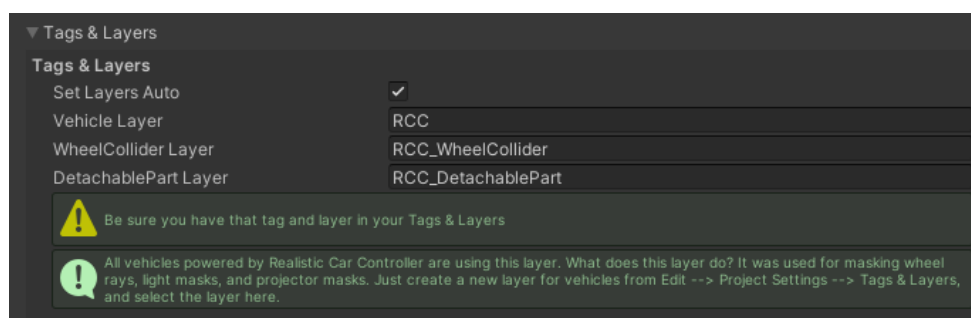
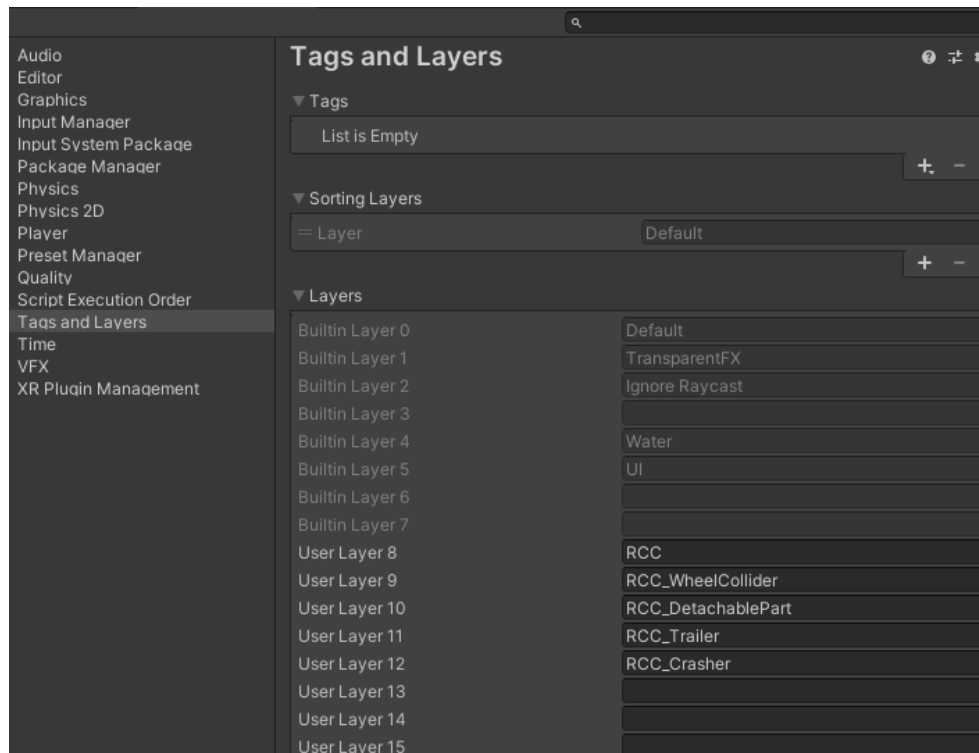
<https://www.youtube.com/playlist?list=PLRXTqAVrLDpoW58IKf8XA1AWD6kDkoKb1>

(You can zoom in with CTRL + ScrollUp for enlarge PDF pages)

# First to Do!

Always backup your project before updating any asset or Unity Editor. Keep your own assets outside of the RealisticCarControllerV4 folder. Delete the entire folder and import the updated version.

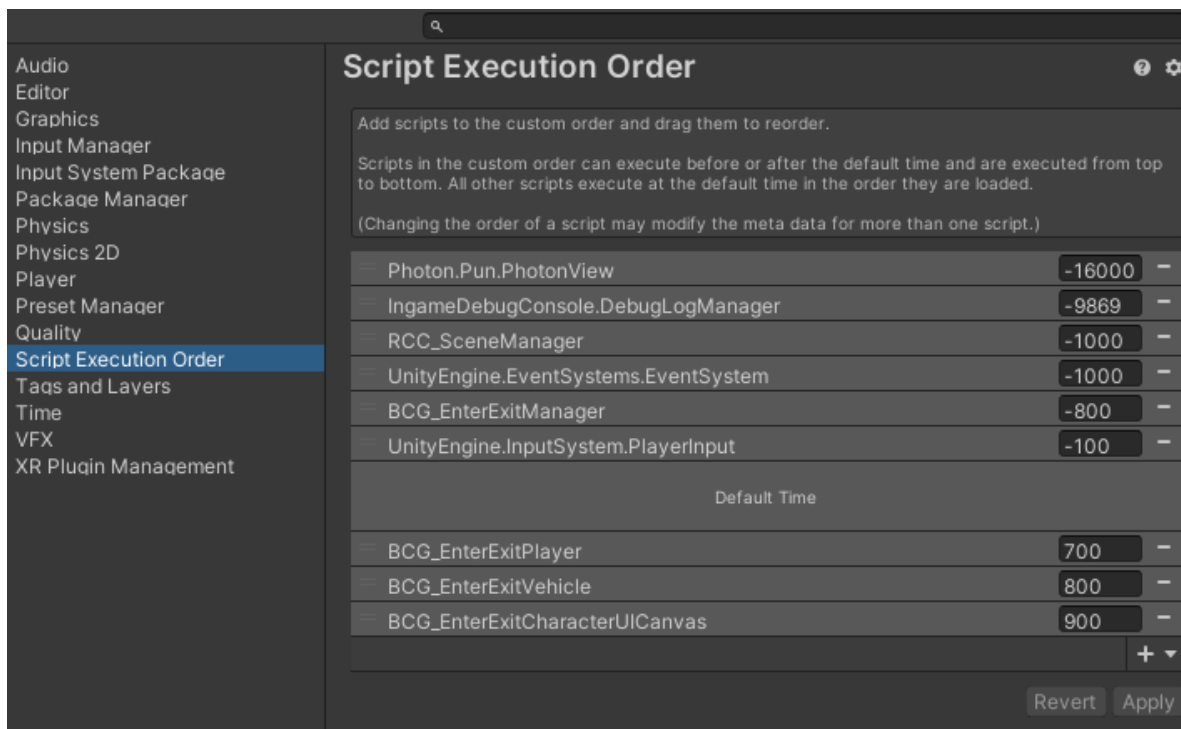
RCC uses **LayerMask** to avoid unwanted raycast hits. Necessary layers will be created automatically, but feel free to check them after the import. These layers must be selected in the **RCC Settings**. Also, you can import it from the **Welcome Screen**, but it will overwrite your **Tags & Layers**.



(Tools → BoneCracker Games → Realistic Car Controller → RCC Settings)

## Script Execution Order

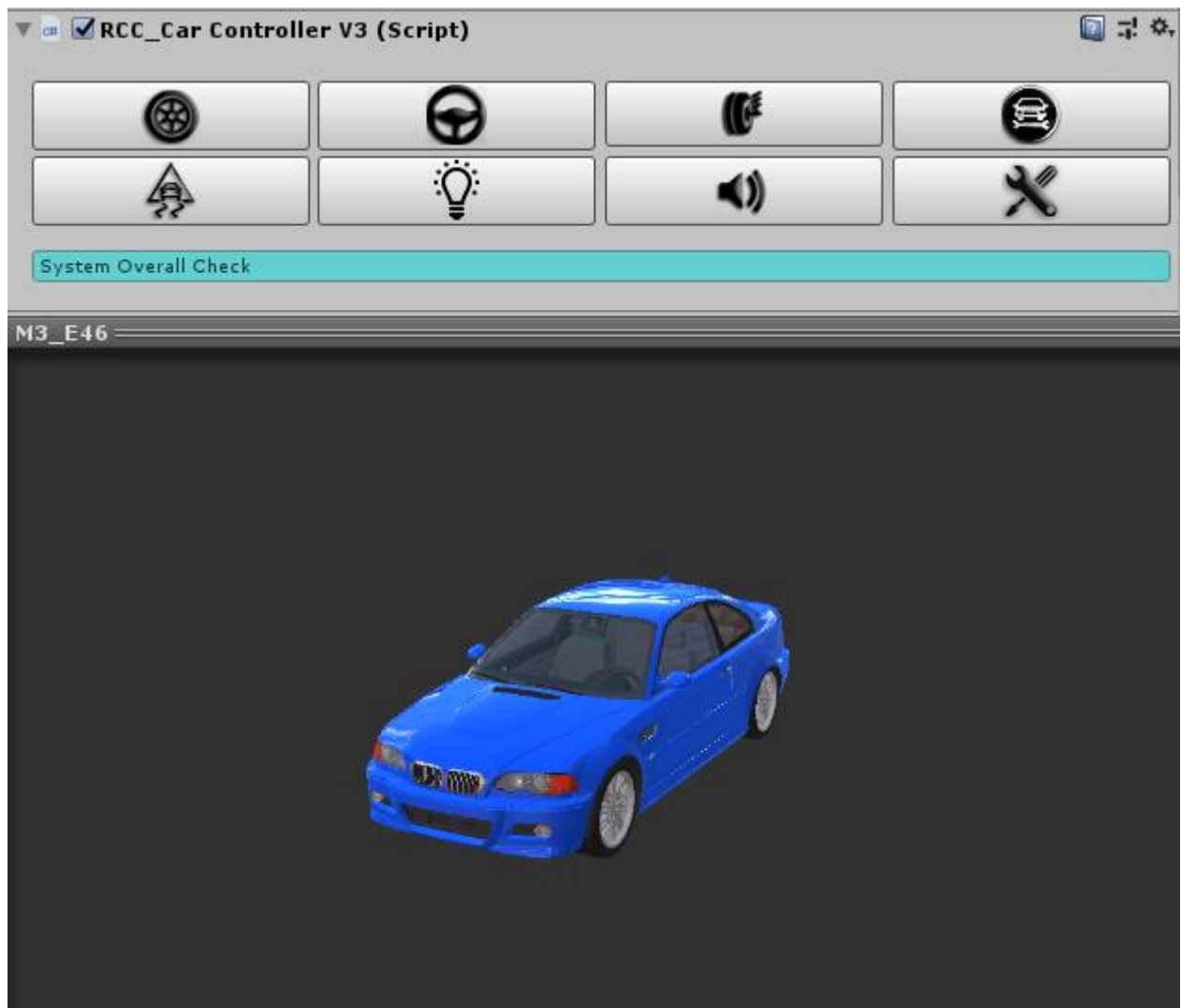
RCC is using **Script Execution Order** to avoid unexpected event conflicts. This should be imported successfully when RCC installed and doesn't require any action. Just make sure you have this order. You can check it in **Edit → Project Settings → Script Execution Order**.



## Overview

Each vehicle has its own **RCC\_CarControllerV3.cs** script. Each vehicle is responsible for its own **RCC\_CarControllerV3.cs**. All global shared settings are in the **RCC Settings (Tools → BCG → RCC → Edit Settings)**. Lights, cameras, and exhausts are addons and not required as an essential. Inputs are processed by the **RCC\_InputManager.cs** script. It will receive corresponding inputs from the selected device. **RCC\_SceneManager.cs** is managing active player vehicle, other vehicles, AI vehicles, record/replay, UI canvases, etc. All other main topics can be found below.

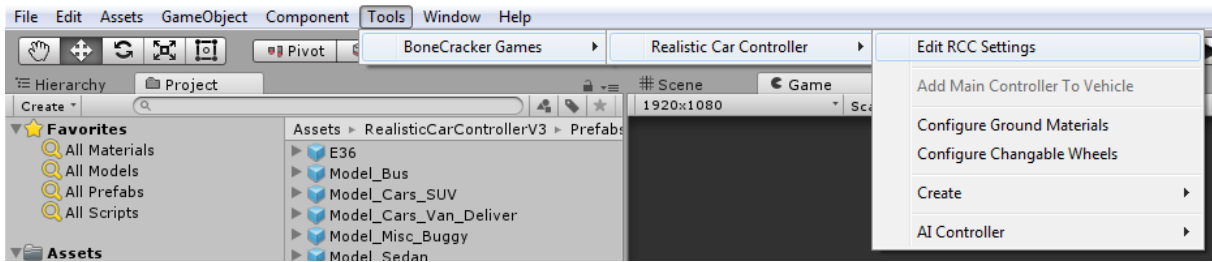
# RCC\_CarControllerV4.cs



**8 Main Categories** for easily and understandable creating / configuring vehicles.

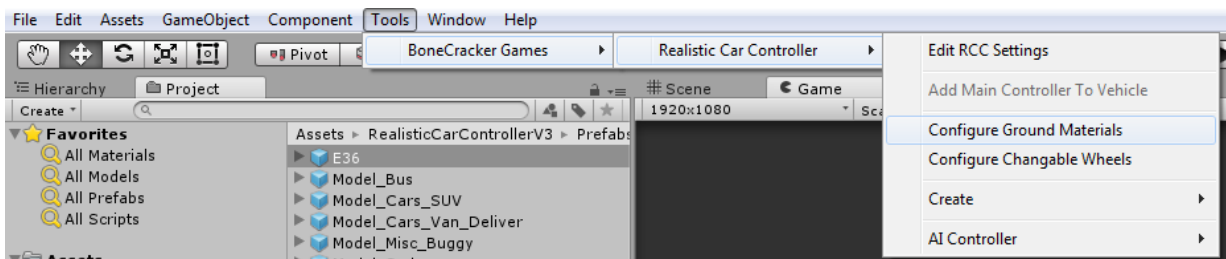
**Wheels**, **Steering**, **Suspensions**, **Mechanic Configuration**, **Stability**, **Lights**, **Sounds**, and **Damage**.

All vehicles are sharing global settings, sounds, and configurations via **RCC Settings**.

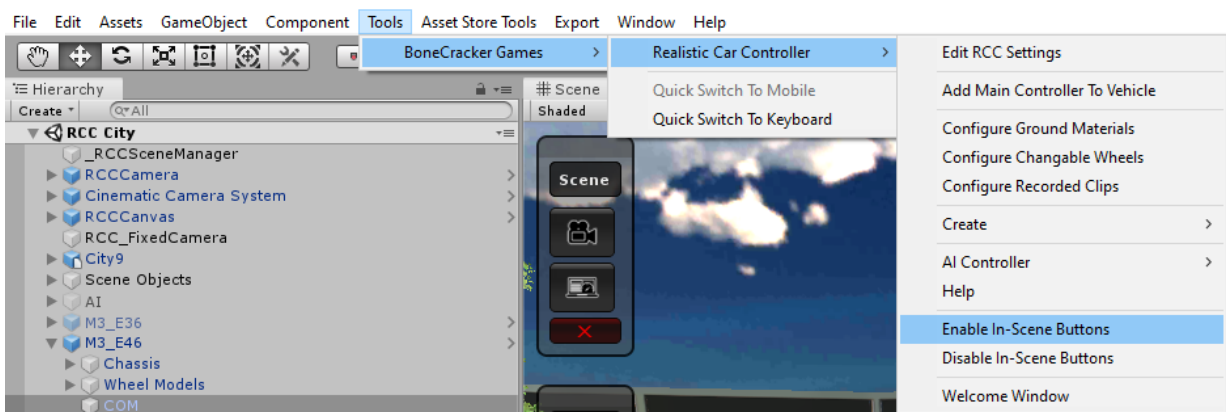


Creating new vehicles have been explained in documentation named “[Realistic Car Controller How to Create New Vehicles.](#)”

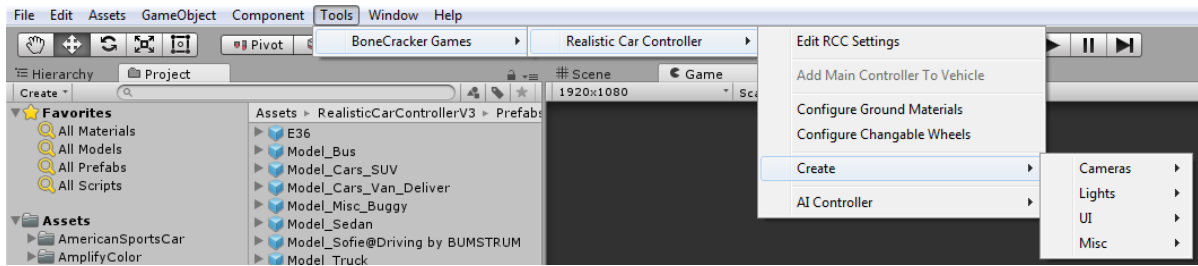
Changing ground materials physics, particles, sounds, etc. in the [Tools → BoneCracker Games → Realistic Car Controller → Configure Ground Materials.](#) (Detailed explanation in the documentation named “[Realistic Car Controller RCC\\_GroundMaterials](#)”)



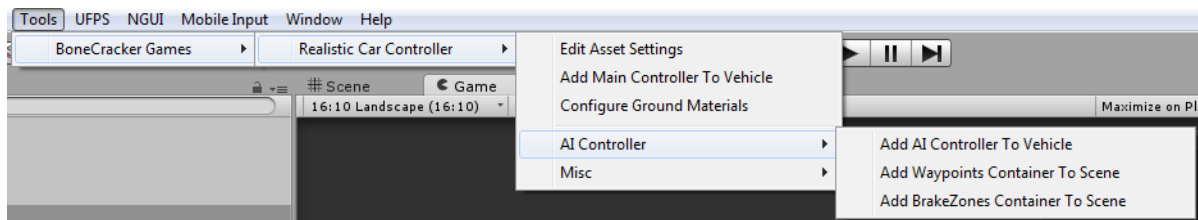
You may want to enable In-Scene buttons to create addons with fastest way. [Tools → BoneCracker Games → Realistic Car Controller → Enable In-Scene Buttons.](#) (Detailed explanation in the documentation named “[Realistic Car Controller How to Create New Vehicles](#)”)



Creating lights, exhausts, mirrors, cameras, etc. in the [Tools → BoneCracker Games → Realistic Car Controller → Create.](#) (Detailed explanation in the documentation named “[Realistic Car Controller How to Create New Vehicles](#)”)

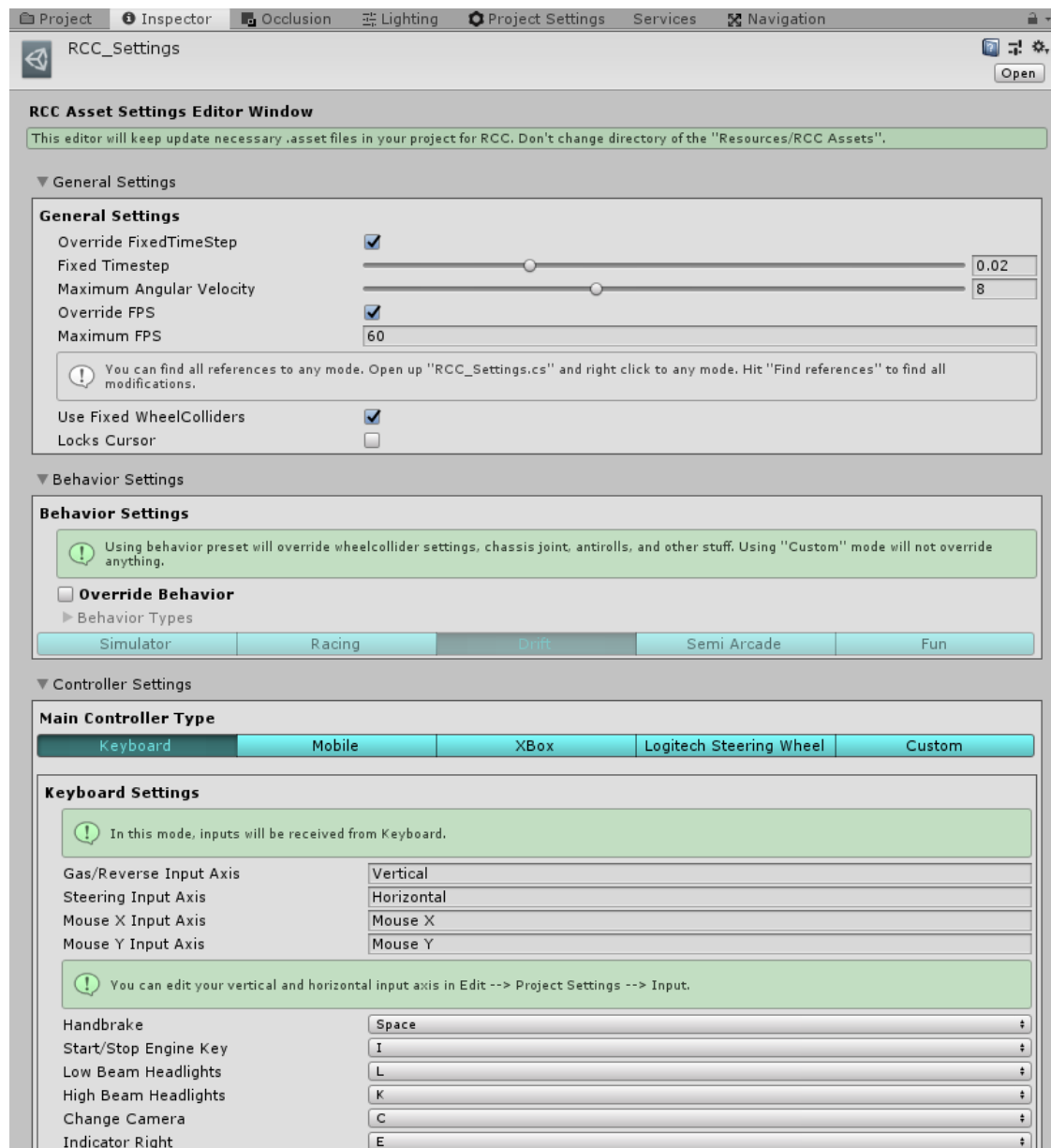


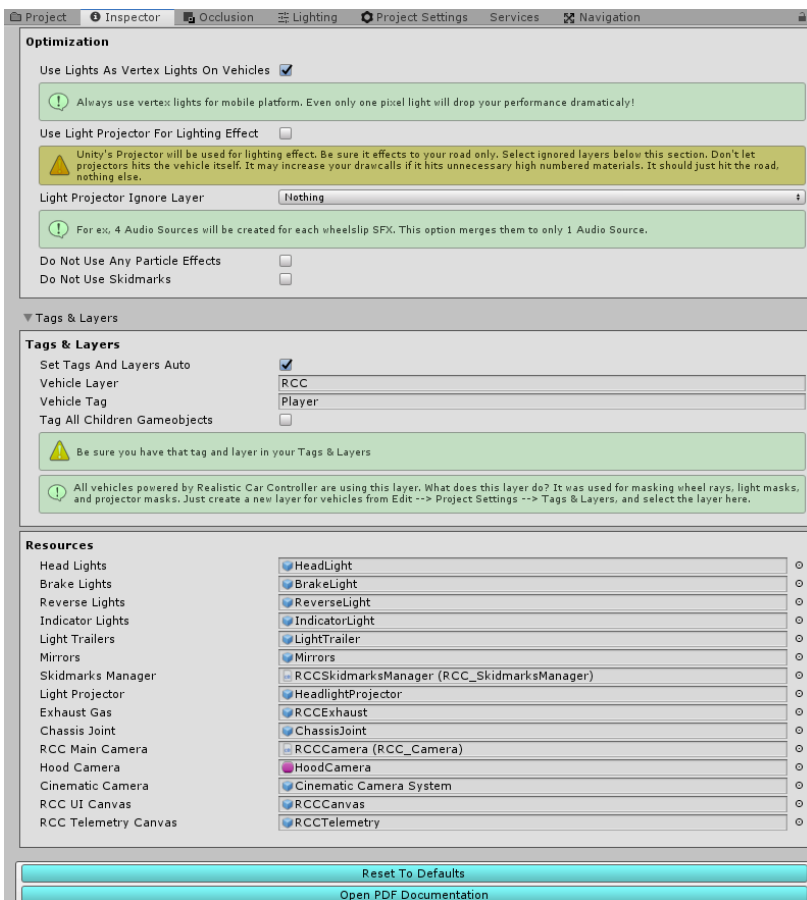
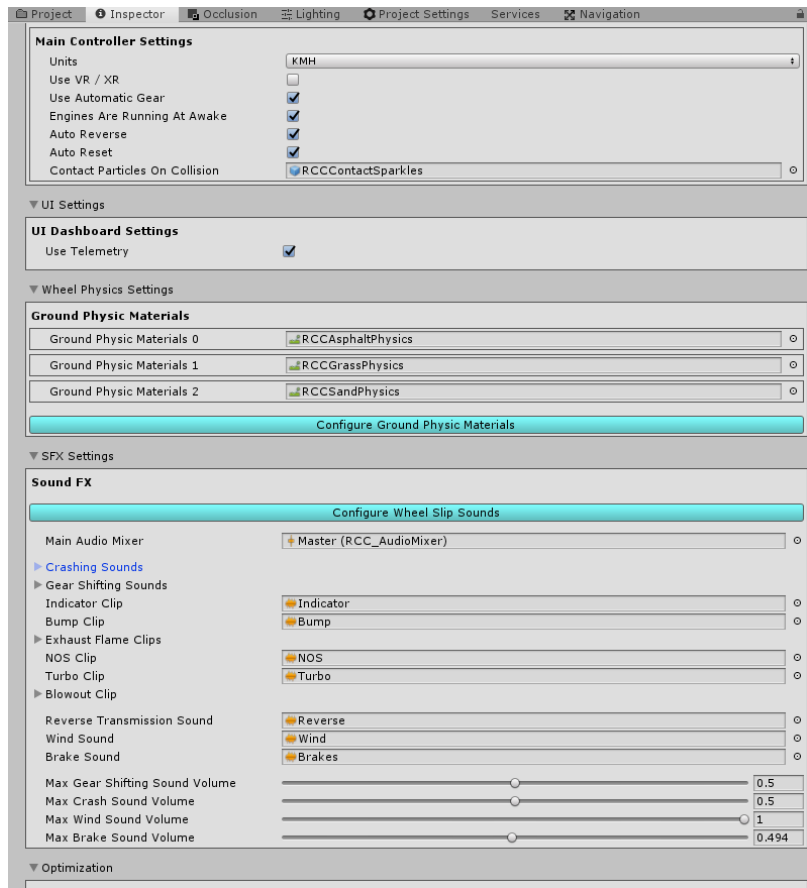
Making vehicles controlled by AI by **Tools → BoneCracker Games → Realistic Car Controller → AI Controller**. (Detailed explanation in the documentation named “**Realistic Car Controller AI**”)



## RCC Settings

Main RCC Settings. It's shared by all vehicles powered by RCC. **Tools → BoneCracker Games → Realistic Car Controller → RCC Settings**. (Detailed explanation in the documentation named “**Realistic Car Controller RCC\_Settings**”)



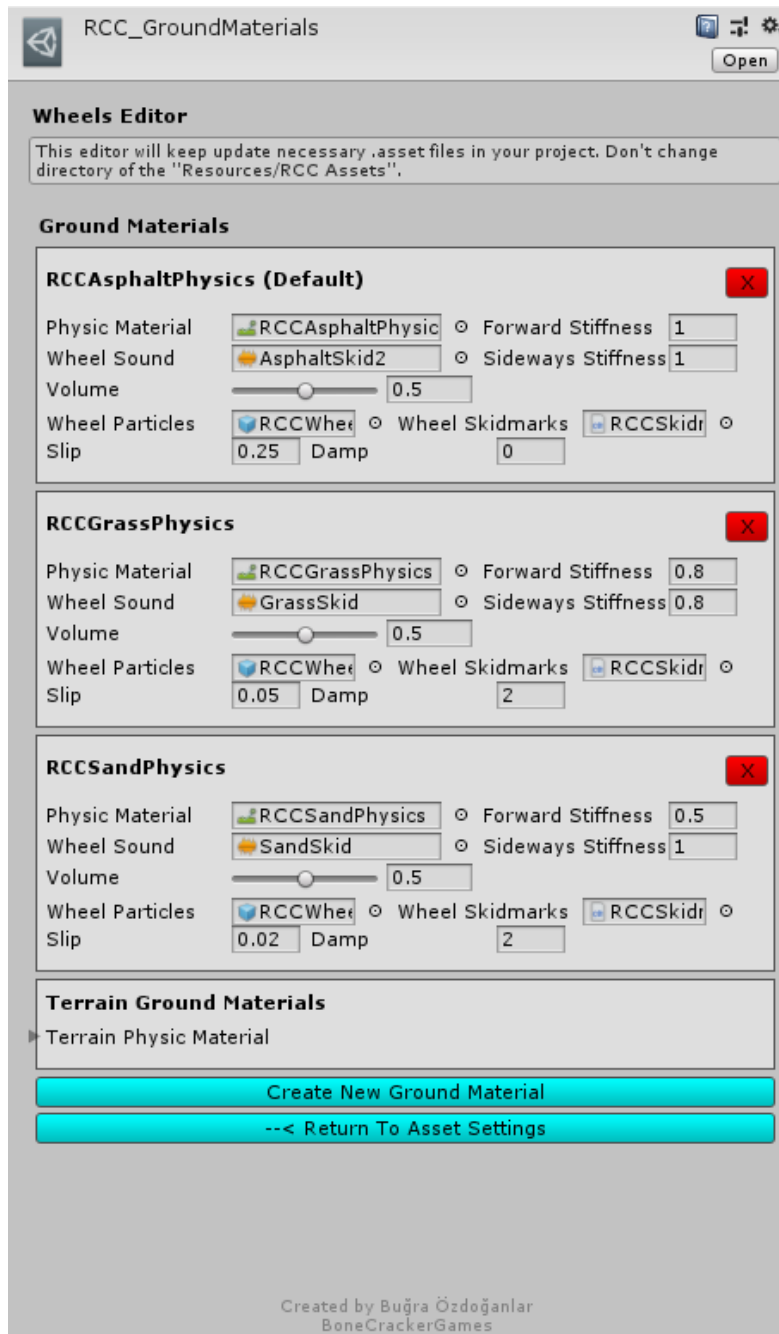




# Configurable Ground Materials

Changing or adding new ground materials, physics, particles, damps, sounds, etc. in [Tools](#) → [BoneCracker Games](#) → [Realistic Car Controller](#) → [Configure Ground Materials](#).

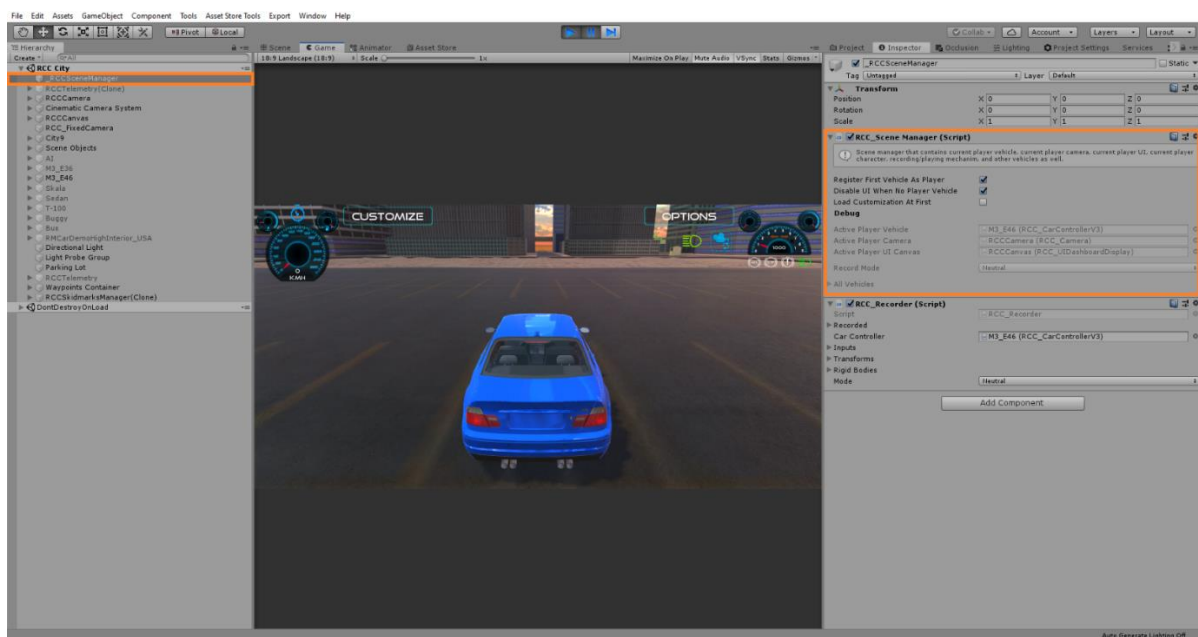
(Detailed explanation in the documentation named “[Realistic Car Controller RCC\\_GroundMaterials](#)”)



If wheelcollider hits a collider with one of the physic material in the list, changes will be applied to the wheelcollider. You can check out demo scenes.

# RCC Scene Manager

Every scene will have this manager automatically. **RCC Scene Manager** contains current player vehicle, current player camera, current player UI, current player character, recording / replay mechanism, and other vehicles as well. Instead of finding current car controller, or camera on scene, RCC Scene Manager will find it and manage it only. All other scripts depending on the player vehicle will take reference of the RCC Scene Manager. For example, finding player vehicle on scene is **[RCC\\_SceneManager.Instance.activePlayerVehicle](#)**. All other codes can be found in scripts documentation.



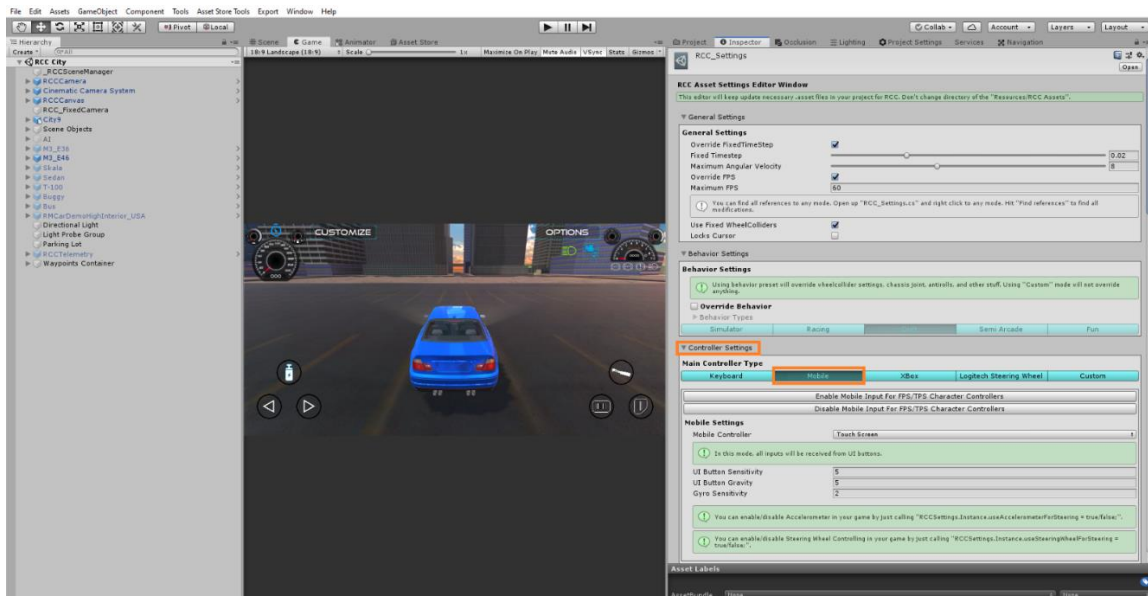
## Controller Types

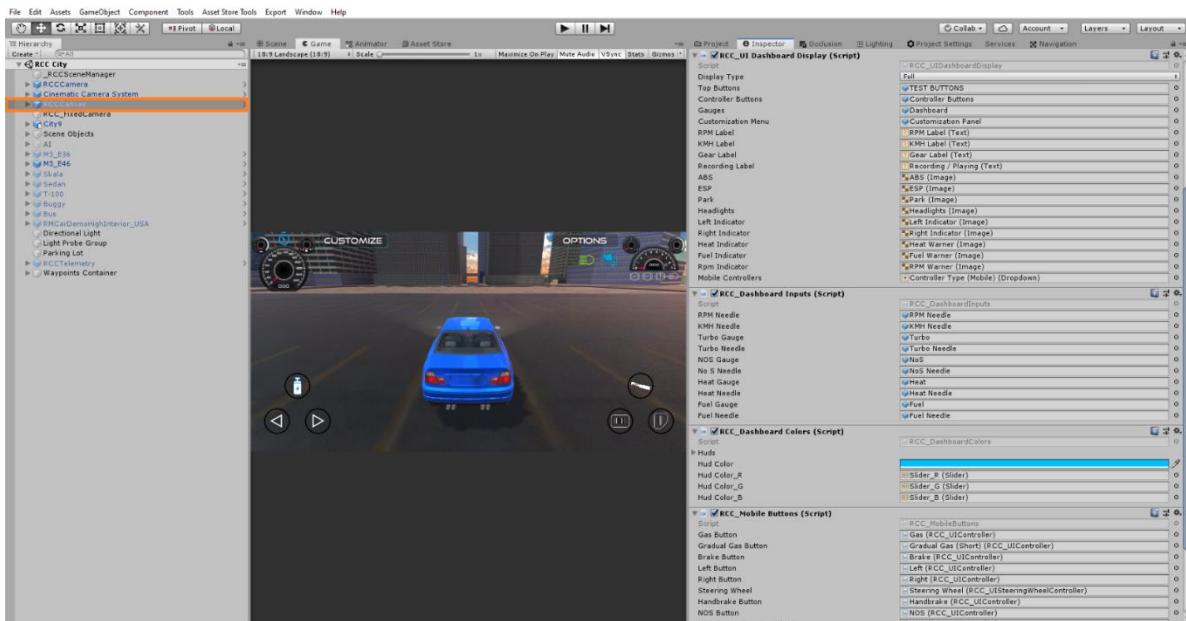
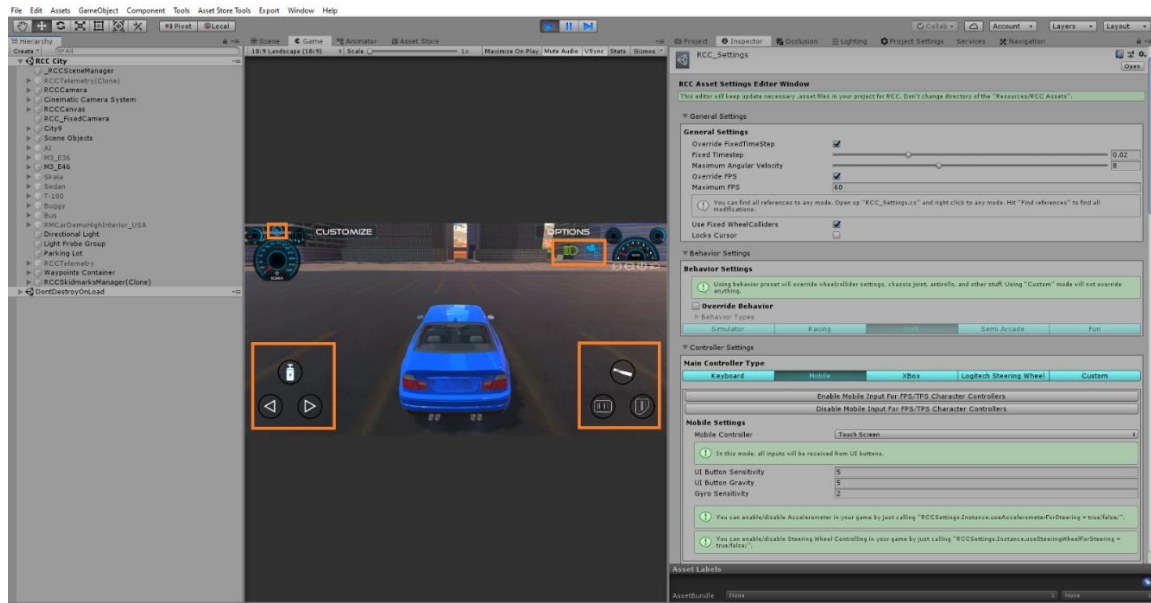
RCC supports all controller types with the new input system. Each controller can be changed directly from the **[RCC\\_InputActions](#)** (Detailed explanation in documentation named **[“Realistic Car Controller New Input System”](#)**)

Logitech Steering requires [Logitech Gaming SDK](#) installed in your project.

# Mobile Controller

Mobile controller is using my own input system instead of the new input manager. Each UI controller button has “[RCC\\_UIController](#)” script for inputs. These buttons feeds [RCC\\_InputManager](#) with normalized float values. You can adjust UI buttons sensitivity and gravity from the [RCC Settings](#). Switching the mobile controller to the new input manager is easy, however I don’t recommend to do this. Because UI buttons will simulate gamepad buttons in this case.





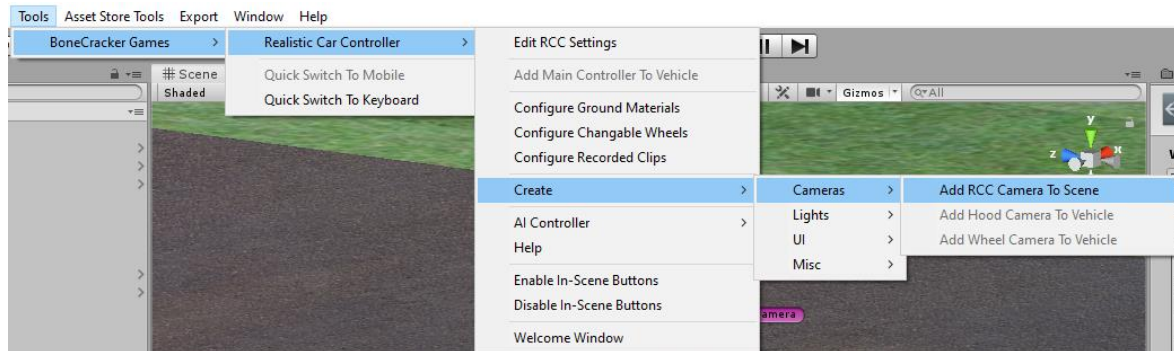
## About Mobile Use on City Scene






The city scene has a lot of specular maps with alpha channels. Textures with alpha channels and bump maps are heavy for mobile devices. In Demo APK in my website is not using any texture with alpha channels. Also, all standard shaders have been replaced with mobile shaders in the **RCC City Mobile** scene at the demo. If you build an APK without editing materials, you may get performance loss on low-end devices.

# RCC Camera


Main camera system designed for using with RCC. Related with vehicle stats and includes six different camera modes with many customizable settings. It doesn't use different individual cameras on your scene. Simply it parents the camera to their positions, and that's all.

If your scene doesn't include RCC Camera, you can create it from [Tools → BoneCracker Games → Realistic Car Controller → Create → Cameras → Add RCC Camera To Scene](#).





**RCC\_Camera (Script)**




Main Camera designed for RCC. It includes 6 different camera modes. It doesn't use many cameras for different modes like \*other\* assets. Just one single camera handles them.

Player Vehicle

None (RCC\_Car Controller V3)

Pivot of the Camera

 Pivot

Current Camera Mode

TPS

Auto Change Camera Mode

☐

**TPS**

TPS Distance

6

TPS Height

2

TPS Height Damping

10

TPS Rotation Damping

3

TPS Minimum FOV

50

TPS Maximum FOV

70

TPS Tilt Maximum

15

TPS Tilt Multiplier

2

TPS Yaw Angle

0

TPS Pitch Angle

5

TPS Offset X

0

TPS Offset Y

0.5

Use Auto Focus

☒

Use Reverse

☒

Use Orbit

☒

TPS Collision

☒

TPS Offset

X 0

Y 0

Z 0.25

Use Occlusion

☒

Occlusion LayerMask

Mixed...

**FPS**

Use Hood Camera Mode

☒



Be sure your vehicle has "Hood Camera". Camera will be parented to this gameobject. You can create it from Tools --> BCG --> RCC --> Camera Systems --> Add Hood Camera.

Hood Camera FOV

60

Use Orbit

☒

Use Hood Camera Mode

!

Be sure your vehicle has "Hood Camera", Camera will be parented to this gameobject. You can create it from Tools --> BCG --> RCC --> Camera Systems --> Add Hood Camera.

Hood Camera FOV

60

Use Orbit

☒

Wheel

Use Wheel Camera Mode

☒

!

Be sure your vehicle has "Wheel Camera", Camera will be parented to this gameobject. You can create it from Tools --> BCG --> RCC --> Camera Systems --> Add Wheel Camera.

Wheel Camera FOV

60

Fixed

Use Fixed Camera Mode

☒

!

Fixed Camera is overridden by "Fixed Camera System" on your scene.

Select Fixed Camera System

Cinematic

Use Cinematic Camera Mode

☒

!

Cinematic Camera is overridden by "Cinematic Camera System" on your scene.

Select Cinematic Camera System

Orbit

Orbit X Speed

100

Orbit Y Speed

100

Orbit Smooth

40

Min Orbit Y

-15

Max Orbit Y

70

Resets orbit rotation after 2 seconds.

☒

Top-Down

Use Top Camera Mode

☒

Use Ortho Mode

☒

Top Camera Distance

100

Top Camera Angle

X 45

Y 45

Z 0

Top Camera Maximum Z Distance

10

Minimum Ortho Size

7.5

Maximum Ortho Size

12.5

Reset To Default Settings

Each camera mode can be customized here. **TPS** mode is required, and all other modes are optional. If you don't want to use hood, wheel, fixed, cinematic camera, top-down modes, you can just disable them here.

## Record / Replay

Complete physics and input based record / replay system. Player vehicle and all active AI vehicles can record / replay. All you must do is press “**R**” for start recording, and “**P**” for start replay. These buttons can be changed in the [RCC\\_InputActions](#). And of course, there is a UI button for mobile.

[RCC\\_Recorder](#) can be found attached to [RCC\\_SceneManager](#) on your scene. You can enable or disable it. Script will be added at awake, or you can add it by manually if enabled. You can use RCC’s API to start record / replay at runtime. For example;

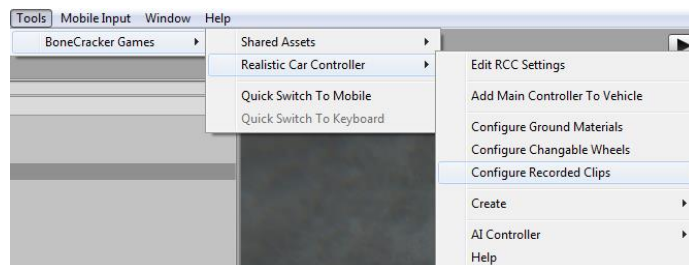
```
RCC. StartStopReplay ();
```

```
RCC. StartStopReplay (RCC_Recorder.Recorded recordedClip);
```

```
RCC. StartStopReplay (int index);
```

```
RCC. StartStopReplay (RCC_Recorder.Recorded recordedClip);
```

All records are stored in the [RCC\\_Records](#). You can access it from the [Tools → BCG → RCC → Configure Recorded Clips](#).







## Customization

You can customize your vehicles by just calling a single method. Please look at “[Realistic Car Controller Scripts](#)” documentation. All methods in the [RCC\\_Customization](#) have been explained there.

## How The Customization Panel Works

I’ve written an example script called “[RCC\\_CustomizerExample.cs](#)” which uses static methods in the [RCC\\_Customization](#). Script is attached to the [RCC\\_Canvas](#). UI buttons in customization panel send methods to this example script. And this example script uses static methods in the [RCC\\_Customization](#) for making changes. Let me explain it with simple examples.

We want to change the front suspension distance of our vehicle. So, we have to use;

[RCC\\_Customization.SetFrontSuspensionsDistances](#) ([targetRCC](#), [targetValue](#));

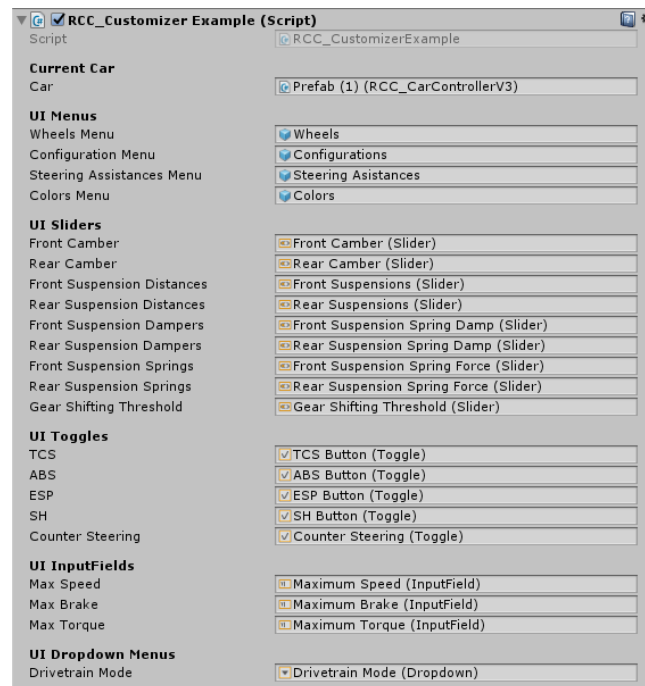
We want to repair our car. So, we have to use;

[RCC\\_Customization.RepairCar](#) ([targetRCC](#));

We want to change the drivetrain of our car to AWD. So, we have to use;

```
RCC_Customization. SetDrivetrainMode (targetRCC,  
RCC_CarControllerV3 WheelType.AWD);
```

And goes on... Simply look at all methods in [RCC\\_CustomizerExample](#) script, you will see how I customized the player vehicle by using [RCC\\_Customization](#) script.



This example script handles all UI menus, buttons, sliders, toggles, input fields, and dropdown menus of the customization panel. It just receives inputs from the UI, and fires necessary actions.

## Credits

Driver Sofie, her animations, and her car model made by 3DMAesen. You can access 3DMAesen asset store from this link.

<http://u3d.as/2vg>

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***Ekrem Bugra Ozdoganlar***

***Bonecrackergames@gmail.com***