

Street_Lighting_4
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Unreal Engine 4.27.2
Level: Street_Main
Game: Street Lighting Game 1.5

Street_Lighting_7
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Unreal Engine 4.27.2
Level: Street_Main
Game: Street Lighting Game 2.3

----- **IMPORTANT** -----

The project as it is works, so as to avoid any bug or mistake, always work with a copy of this project as to always have a version to go back to.
Whenever you import a big package of assets or want to make a big change, it's advisable to make a different project and name it as a different version just in case.

- ***Night Light:***

Sky Sphere BP:

- ❖ Sky colours configured by hand and without any restriction.
- ❖ Sun Brightness: 2.8
- ❖ Stars Brightness: 0.5


Sky Light:

- ❖ Indirect lighting scale and colour for a more realistic and natural night ambiance.
- ❖ Added a cubemap of a night ambiance.
- ❖ Cloud ambient occlusion enable

Directional Light (Moon) was added to simulate the effect of the moon

- ❖ Change temperature to change the colour off the moon light
- ❖ Casting shadows was desable for avoiding light overlapping
- ❖ Intensity: 1 lux (this is too sensible, change this as you want).

Exponential Height Fog to give the scene a more realistic look, following this video:

 [Lighting a NIGHT-TIME exterior in Unreal](#)

Post Processing Volume manages the last details, like exposure and color grading.

- **Lamp Posts**

Only 2 types of Lamp Posts were added in the street and in the park. The street one looks pretty decent but the one in the park still looks artificial, this needs further work. To avoid any issues, always make sure there are no more than 4 moveable or static lights colliding (check attenuation radius) because you'll have to separate them or set enough of them to Static, affecting realism. You have two types of blueprints which you can modify at ease.

- ❖ Lamp_Post → spotlight's characteristics:

- Mobility: Movable (be aware of the light overlapping)
 - Attenuation radius: 2300
 - Inner Cone Angle: 15 (stronger light)
 - Outer Cone Angle: 62 (weaker light)
 - Temperature: 3000
 - Volumetric Scattering Intensity: 0.6 (if higher, light shaft is stronger)
 - Cast Volumetric Shadows: Enable (more realistic)
 - Cast Deep Shadow: Enable (more realistic)

- ❖ Park_lamp → point light's characteristics:

- Mobility: Movable (be aware of the light overlapping)
 - Attenuation radius: 1000
 - Source radius: 18 (size of the light source)
 - Temperature: 3000
 - Volumetric Scattering Intensity: 0.6 (if higher, light shaft is stronger)
 - Cast Volumetric Shadows: Enable (more realistic)
 - Cast Deep Shadow: Enable (more realistic)

- **Basic landscape with road, pavement and grass foliage:**

- To edit road: go to Landscape mode and click splines.
 - Decals were added manually and altered to get a realistic look. All of them were taken from the Megascans library.
 - To edit landscape material: go to Content_Browser/Foliage and open Landscape Material. There are the base colours for each layer + the sampling of each Landscape Grass Type.
 - To edit grass: in the same folder as Landscape Material, there are the Landscape Grass Type files with all the information about the grass, leaves, rocks, plants to sample in the Landscape.
 - When adding a new type of grass, make sure to disable Dynamic Shadows in the Landscape Grass Type file.

- **Trees and bushes made with Foliage mode.**

- When adding new tree meshes, make sure that in the Static Mesh Details/LOD Settings → LOD Group is selected as "Foliage".
 - Always check the amount of triangles of the mesh to get an estimate of the impact on performance (also with grass).

- **Tips**

- All vegetation was taken from the Epic Games store for free given by "Project Nature". At first meshes were taken from "Megascans" using their app Bridge but all the objects were incredibly expensive to render and it had a massive performance impact. Some

props were taken from Megascans but there are only a few instances of them and they are static and do not affect FPS. Other props (lamps, benches, trash bins and playground) were taken from a project I found for free in the Epic Games store (Cty Park Environment Collection).

There are many interesting things there if you want to add anything else, make sure to check it out (watch out it's a big project and it takes a while to compile).

- When simulating, always check FPS and render time (in Output Log enter "stat fps" command). Try to maintain FPS above 40-50 and render time below 20 ms. The more, the better. Also take into account that FPS in Editor Mode are different from those in VR simulation, so it's necessary to check all the time to see if it is working properly. Trees and foliage are the main source for performance decrease and if it happens, lighting and shadows configuration need to be checked.

- Buildings were originally taken from the CityEngine plugin for Unreal. In their website there are example projects from which (New York City project) the buildings were migrated into a local content folder. Make sure you migrate the static mesh for the building alongside the Esri Rule Package located in the main project folder. Make sure to disable Collision in each Static Mesh if there is trouble with movement in VR. Houses and buildings location can be fixed by giving it a more realistic look. You need to check and see what looks best. (<https://esri.github.io/cityengine/vitruvio>)

- Packaging was made for Windows 64 bits and the .exe files are located in the folders 'Street Lighting Game' with the version number, last one is 2.3. Make sure to name them accordingly (3.0 for the next person that works with this project).