



2.12 Time of Day (a.k.a. Season) Blueprints

Version 1.0

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1 Introduction

This document is intended to aid in the creation of new time of day files in Rail Simulator. The time of day file contains information about the following:

- Sky colour at various times throughout the day.
- Sunrise and moon rise/set times
- Sun and moon size
- Sun and moon texture
- Skydome texture
- Fogging distance and colour
- Various ambient colours throughout the day

These time of day files are designed to be set up on a seasonal basis although this is not compulsory. There is scope for four separate files to be referenced by a route (from the route template blueprint) so ideally one should be created for each of the four seasons but a single file could be referenced four times.

2 Blueprint Creation and Structure

The Asset Editor should be used when creating or editing any blueprint. The Asset Editor is provided in the Rail Simulator Developer Tools which are available to download from www.railsimulator.com.

Once the Developer Tools have been installed the Asset Editor can be launched from the start menu via: Programs > Rail Simulator Developer Tools > Tools > Asset Editor.

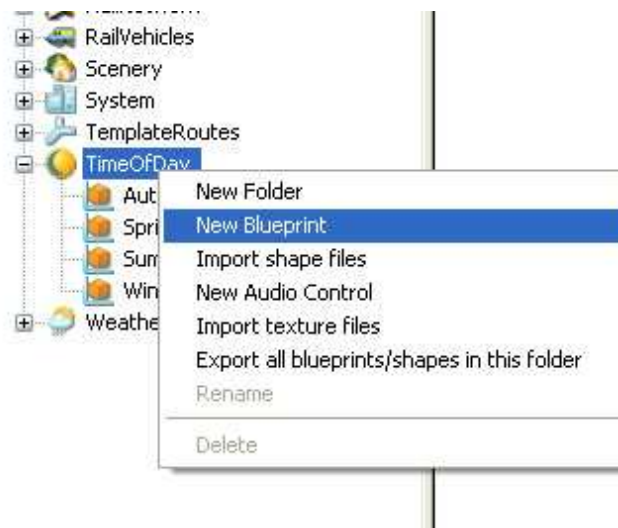
2.1 Blueprint Location

Time of day blueprints should be located under the following folder structure:
c:\Program Files\Rail Simulator\Source\<Developer>\<Addon>\ TimeOfDay

<Developer> is the folder name of the developer creating the new content and <Addon> is the product name of the new content. For the boxed version of Rail Simulator the developer is Kuju and the product is RailSimulator.

2.2 Blueprint Creation

In the Asset Editor navigate to the location of the time of day folder described above and right click the mouse on the TimeOfDay folder.



A menu appears with several options. Select the New Blueprint option to create a new blueprint which you will be able to edit later.



A new window appears displaying a list of available blueprint types. Scroll down the list using the right hand scroll bar until you see the Sky info BP. Left click this option and press OK.

A new blueprint is then created with a default name which you change to something more memorable either now or at a later time. Blueprints can be renamed by right clicking the blueprint name and selecting the Rename option. This blueprint name will be referenced by a route template blueprint so settle on a name before linking from that blueprint. The main window of the Asset Editor now displays the various fields needed to set up the sky behaviour based on the time of day.

2.3 Blueprint Structure

The blueprint is large and divided into several sections. The blueprint is so large only because a lot of the same data is repeated for a different time of day. To simplify the blueprint layout, the structure is as follows:

- General Sun and Moon information
- Time of day information for:
 - Break of Dawn
 - Dawn
 - Morning
 - Noon
 - Early Evening
 - Dusk
 - Night
 - Midnight

The eight times of day mentioned above all contain data laid out in the same way. Each of the times of day requires the following information. Most of this information is specifying a colour based on RGB values.

- Time
- Upper and Lower sky colour information
- Sun glare, amount and colour.
- Sun light colour
- Cloud colour

- Moon light colour
- Back fill colour
- Uplight colour
- Ambient colour
- Fogging information

This document will only go into detail about one time of day as the principles learned there can be applied in an identical way to the other seven.

3 Sky Information

The first part of the blueprint contains general information pertaining to the sky, the sun and the moon. Using the Autumn season of the Isle of Wight Add-On as an example, this section will detail what each of the values affect.

| | |
|----------------|---------------------------------------|
| Season | SEASON AUTUMN |
| Sky time info | |
| Info sun | |
| Rise time | |
| 1 hour | 6 |
| 1 minute | 15 |
| 1 seconds | 0 |
| Set time | |
| 1 hour | 19 |
| 1 minute | 45 |
| 1 seconds | 0 |
| Azimuth angle | |
| 1 | |
| Info moon | |
| Rise time | |
| 1 hour | 19 |
| 1 minute | 0 |
| 1 seconds | 0 |
| Set time | |
| 1 hour | 6 |
| 1 minute | 0 |
| 1 seconds | 0 |
| Azimuth angle | |
| 0.5 | |
| Starting time | |
| 1 hour | 10 |
| 1 minute | 0 |
| 1 seconds | 0 |
| Time scaler | |
| 1 | |
| Sky dome mesh | Environment\Sky\sky.IGS |
| Sky dome tex | Environment\Sky\textures\sky_dome.ace |
| Sun texture | Environment\Sky\Sun01.ace |
| Moon texture | Environment\Sky\Moon01.ace |
| Sun radius | 45 |
| Moon radius | 35 |
| Sun scale val | 4 |
| Moon scale val | 1 |

3.1 Sun/Moonrise and Sun/Moonset

The rise and set times of the sun and moon are entered here. The time is specified over three fields: Hours, minutes and seconds in 24 hour clock format. The rise time is the time the sun or moon texture (defined later) first starts to emerge over the horizon. The set time is when the texture dips below the horizon.

Azimuth has an effect on shadow fall and general darkening of the ground. The range of values where there is a visible difference is between 0 and 1.5. The higher the value the longer the shadows and darker the ground becomes. A value between 0 and 1 is recommended.

3.2 Starting Time

This is the time of day at which becomes the default start time for any new scenarios. After a scenario has been created, the time at which that scenario starts can be easily changed by double clicking the scenario icon in the scenario editor and editing the properties.

3.3 Time Scaler

This is basically a multiplication value of time. The default value is 1 and means that a 24 hour day in the simulation will happen in 24 hours real time. Increasing this value will speed up the flow of time. This is a useful value for test purposes so that you can quickly see the outcome of adjusting the values and colours in the time of day blueprint.

3.4 Meshes and Textures

This section of the blueprint is used to specify what assets and textures are used as sky furniture. The sky dome mesh is an asset so the .igs file needs to be listed and the remaining three are textures, meaning the .ace file must be listed.

3.5 Sun and Moon Radius / Scale

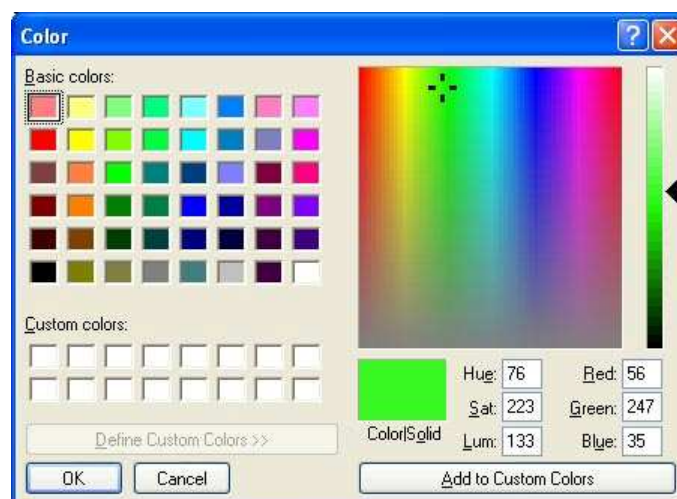
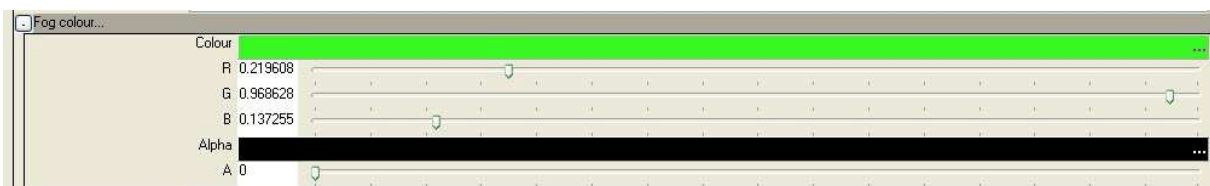
Adjusting these values changes the size of the sun and moon in the sky.

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4 Time of Day Information

There are eight distinct times of day each containing the same type of information. As the principles found in one are the same as the other seven only one needs to be described in depth. For the purpose of this document, very obvious but unrealistic colour choices have been made to clearly convey what each lighting effect does.

To change the colour you want, either move the sliders, enter a numerical value or click the colour bar to bring up a colour select window.



NOTE: The alpha section and slider currently has no effect.

4.1 Time

This is the time at which this phase of the time of day file starts. The time is entered using the hours, minutes and seconds fields and uses the 24 hour clock format.

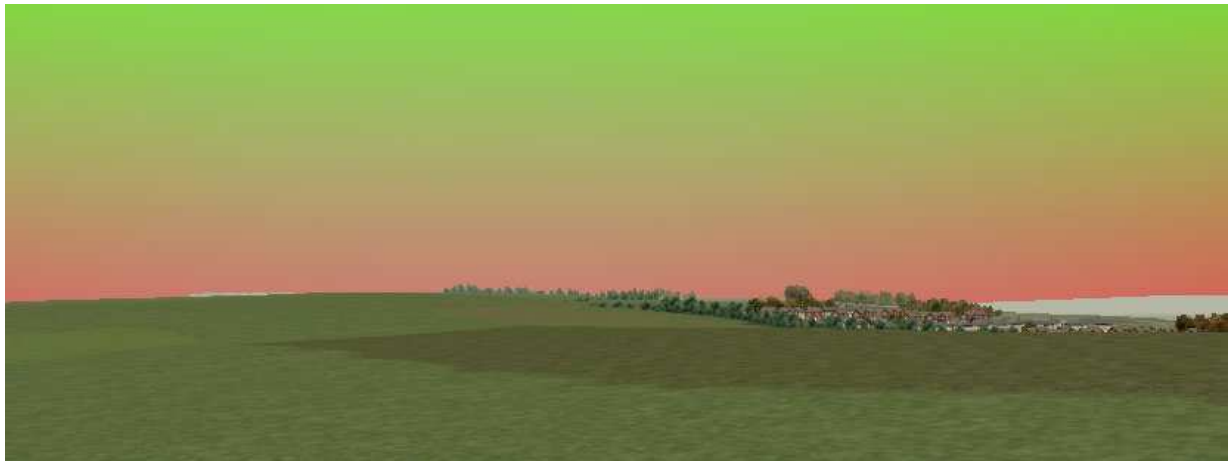
The way times set in this field work in relation to the seven other different times is that when the 24 clock rolls past, at the time specified here, the settings are displayed exactly how they detailed in the sections below. As soon as that time passes they will begin to blend towards the values of the next time period. If this time period is ten hours in the future then the blending will be very subtle and take a

long time, but if the next phase is thirty minutes away then the blending will happen faster and be more pronounced.

4.2 Upper and Lower Sky Colour

The colour of the sky can be divided into two, with one colour near the top of the sky dome and the other appearing closer to the horizon. The Sky gradient height value determines how high up the blending between the upper and lower sky colours occur. A low value will have the blend near the horizon, making a small band of lower sky colour while a high value will raise the transition point, making the lower sky colour reach higher.

In the example below, the upper sky has been given a green colour and the lower sky red and a gradient height of 50.



4.3 Sun glare Colour and Amount

The sun has an aura around it which has a dedicated colour. The Sun Glare Amount determines how diffuse and far reaching the effect is.



A low glare value, such as 1, will be very diffuse and fill a large area of the sky. A higher value becomes more focussed around the sun. Below is a pink coloured glare set at a value of 100.

4.4 Sun Light Colour

This is a subtle tint on the terrain when the sun is in the sky. Although it affects all the terrain it is more apparent on paler terrain. The image below shows a pink sun light colour affecting the hue of a seaside scene.



4.5 Cloud Colour

Changing this value can have some very dramatic repercussions as it tints all the clouds with the specified colour. As most of the clouds are white to begin with, tinting a white colour will bring the new colour through very strongly. The grey, stormier clouds will also be affected but the effect will not be as strong as they are darker initially.



4.6 Moon Light Colour

Similarly to sun light colour, this tints the terrain textures when the moon is out. In the night scene below the moon light colour has been set to dark green.



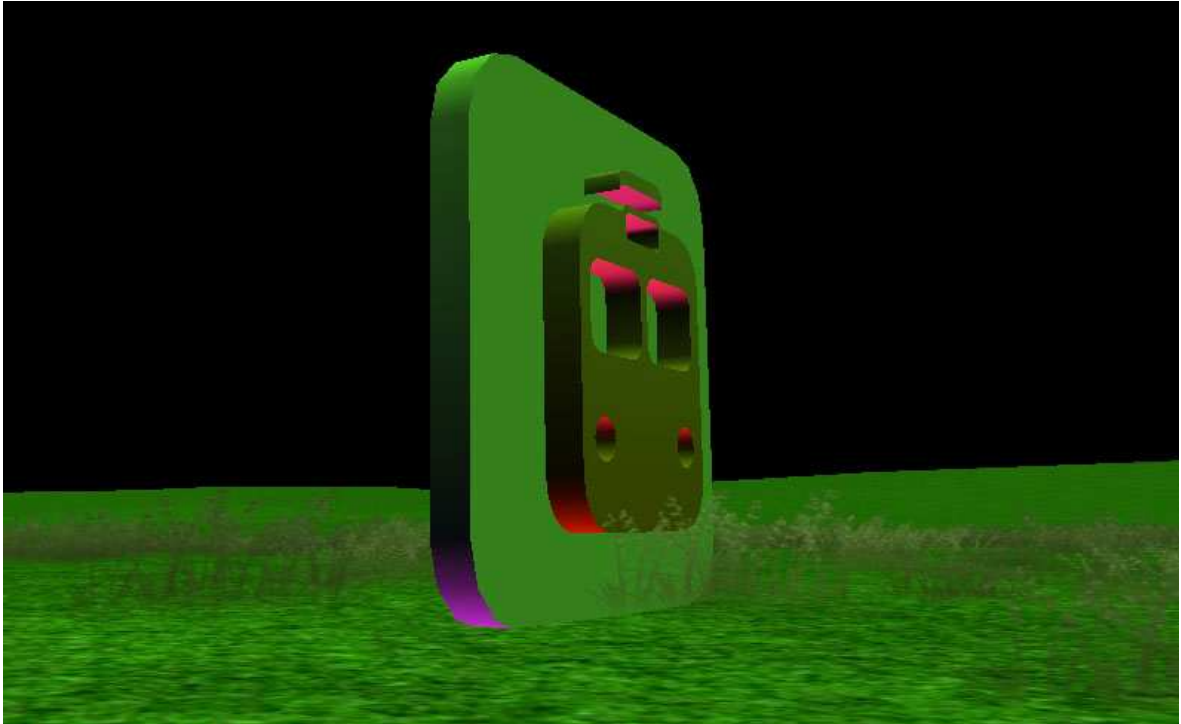
4.7 Back Fill Colour

This is a directional light affecting the back and side of an object. This can be used well in conjunction with sun light colour which casts a sun glow colour on the terrain.



4.8 Uplight Colour

This is a light that is cast upwards from the ground. In the example, the pink uplight colour is being cast upwards from the ground onto a scenario marker. The rest of the green the image is back fill and moon light.



4.9 Ambient Colour

Setting an ambient colour affects everything. This will tint the terrain as well as all sides of an object. An ambient colour should be a very subtle shade as it is so far-reaching. Here the ambient colour has been set to mauve.



4.10 Fog Colour

Fog colour is important even for when it is not typically foggy. Fog in Rail Simulator is a useful boundary for restricting the viewable distance. Without any fog values the horizon would be unnaturally in focus.

The fog below has been given a lime green colour. Typically it will be closer to white or grey.



4.11 Fog Start and End

This value is in metres and determines how close to the camera the fogging effect begins.

Fog End determines the point at which all objects become fully fogged out. Setting this to a relatively small value, such as 50, will mean that any objects further than 50 metres from the camera will be totally obscured by the fog.

Note that these fog settings are the general fog settings for this time of day and can be overridden if a weather pattern is happening that has opted to use its own fog settings, complete with colour.

5 Exporting the Time of Day Blueprint

Once the blueprint has been completed to your satisfaction you should save and export the blueprint.

Exporting the blueprint places the information contained into a game ready format. After a successful export the new time of day file will be immediately picked up for whatever season it is associated with in the route template blueprint.

You do not need to restart Rail Simulator to see the change in an exported time of day file, but you will need to reload the route.