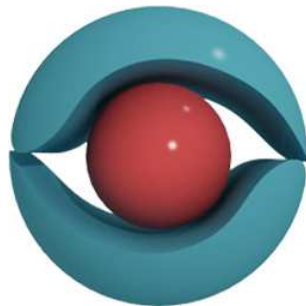


AR-media™

TUTORIALS  
“SHADOW PLANES”

(May, 2011)



## Copyright

Copyright © 2008/2011 Inglobe Technologies S.r.l. All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual or otherwise, without the prior written permission of Inglobe Technologies S.r.l.

## TUTORIAL - “SHADOW PLANES”

### INTRODUCTION

More than often you may need to add a *soft diffuse shadow* that your ‘virtual’ model casts over a ‘real’ plane where the model is supposed to be placed. This involves the creation of a virtual transparent plane (the shadow receiver) that, even though invisible, must show the received shadows. This tutorial will teach you how to achieve such an effect. An example of this scenario is shown in the following figure.



note the diffuse shadows just below the car.

### EXAMPLE ‘SHADOW PLANE’

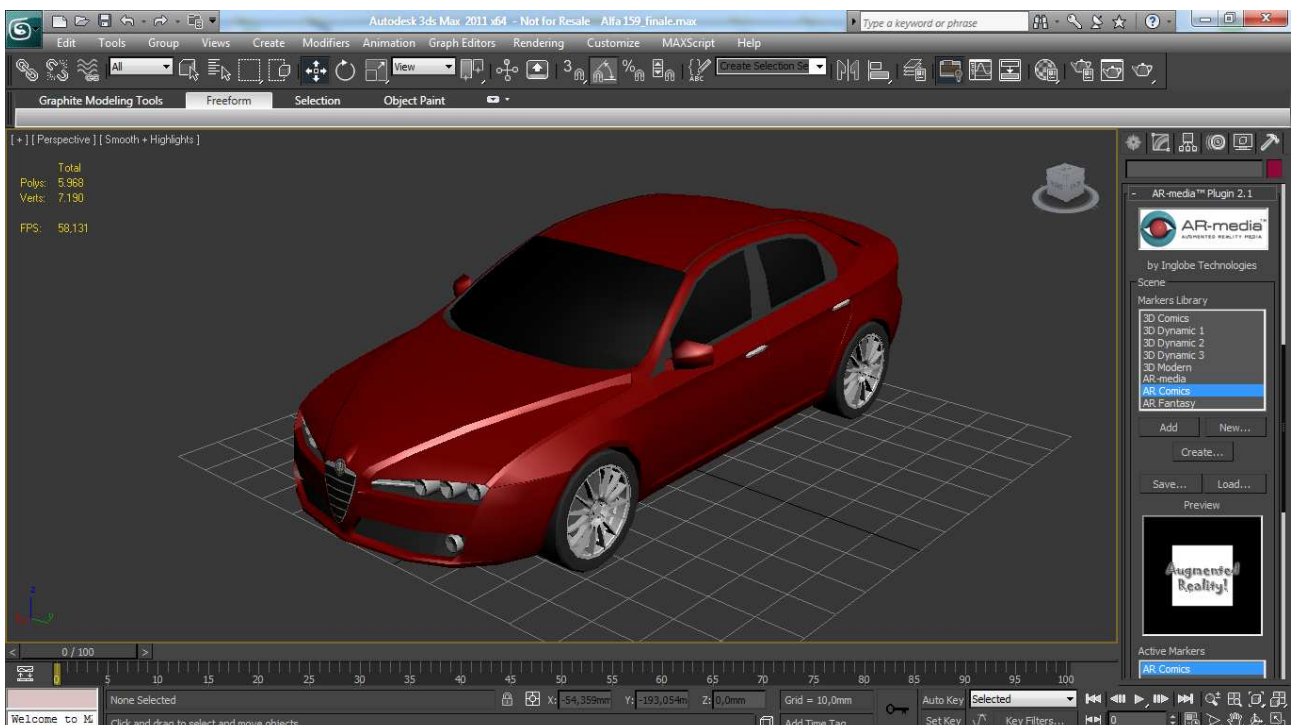
The example will show you how to use an existing model and how to place it into reality by means of a shadow plane that will help to achieve a nice looking effect.

#### Step 1: scene setup

Create or load the model you’d like to use for this tutorial, in our case we’ll use a nice car.

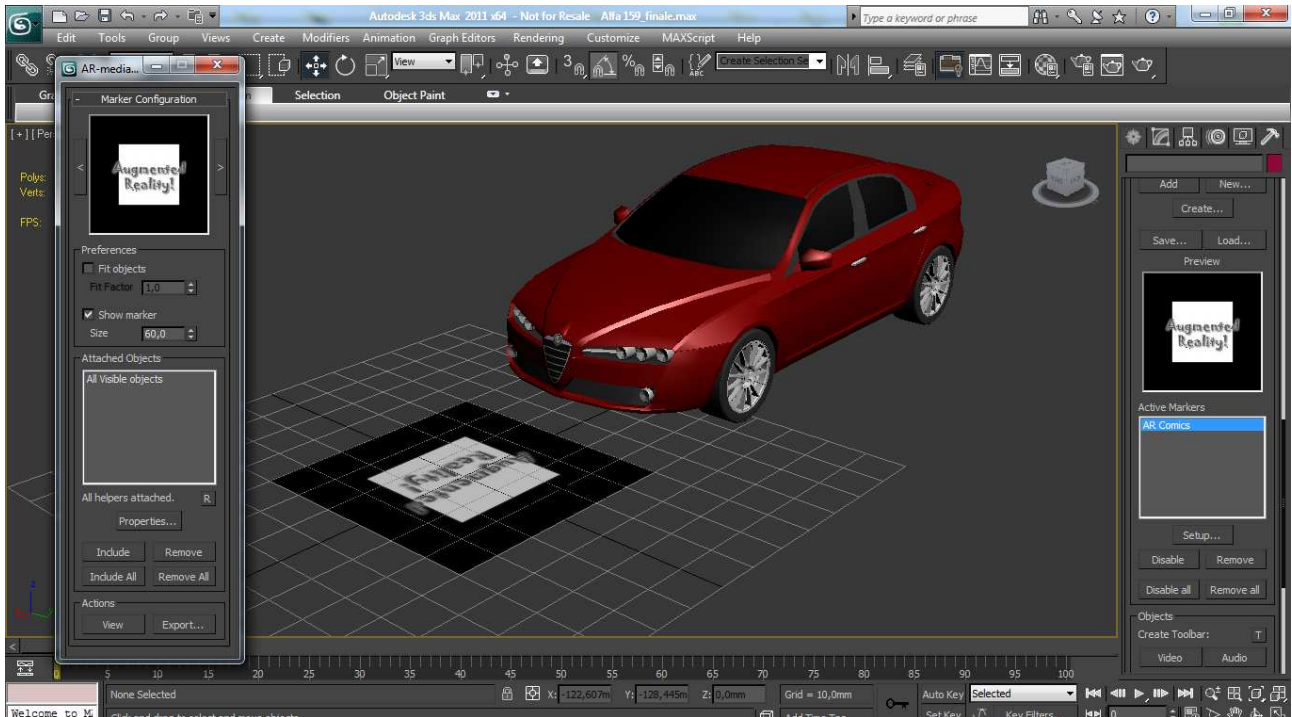


Let's preview the model with the plugin: click the **Utilities** panel (the little hammer icon), then **MAXScript** button and, in the **Utilities** list, select the **AR-media™ Plugin** entry. Scroll down so that the plugin rollout is visible, in the **Markers Library** select one of the available markers, click **Add...** to add it to the **Active Markers** list



finally select the added marker in the **Active Markers** list and click the **Setup...** button. The markers setup window will appear.

Click the **Show marker** option to turn it on, the chosen marker will show in the viewport. Eventually change its size so that the model looks big enough; click the **Include All** button to add the whole scene to the marker



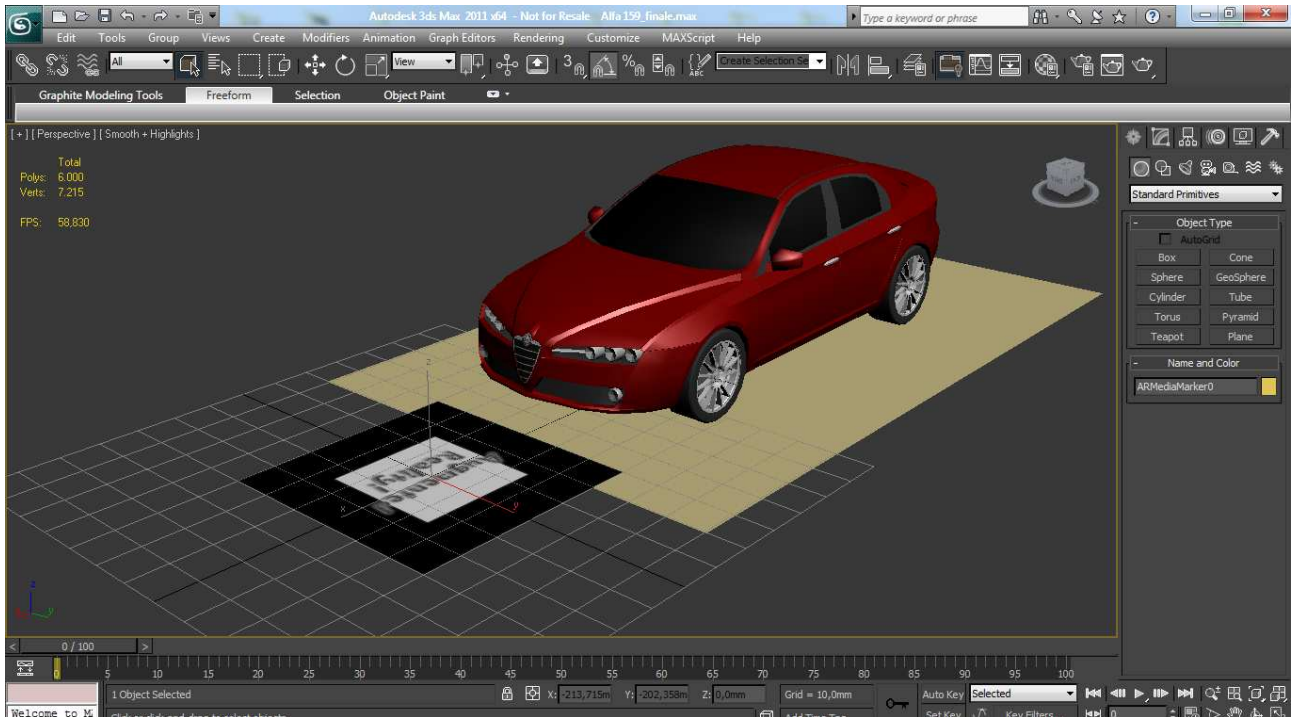
notice that we moved the model a little away from the marker so we'll be able to better see its shadows on a real table. Click the **View** button to see how the scene looks like



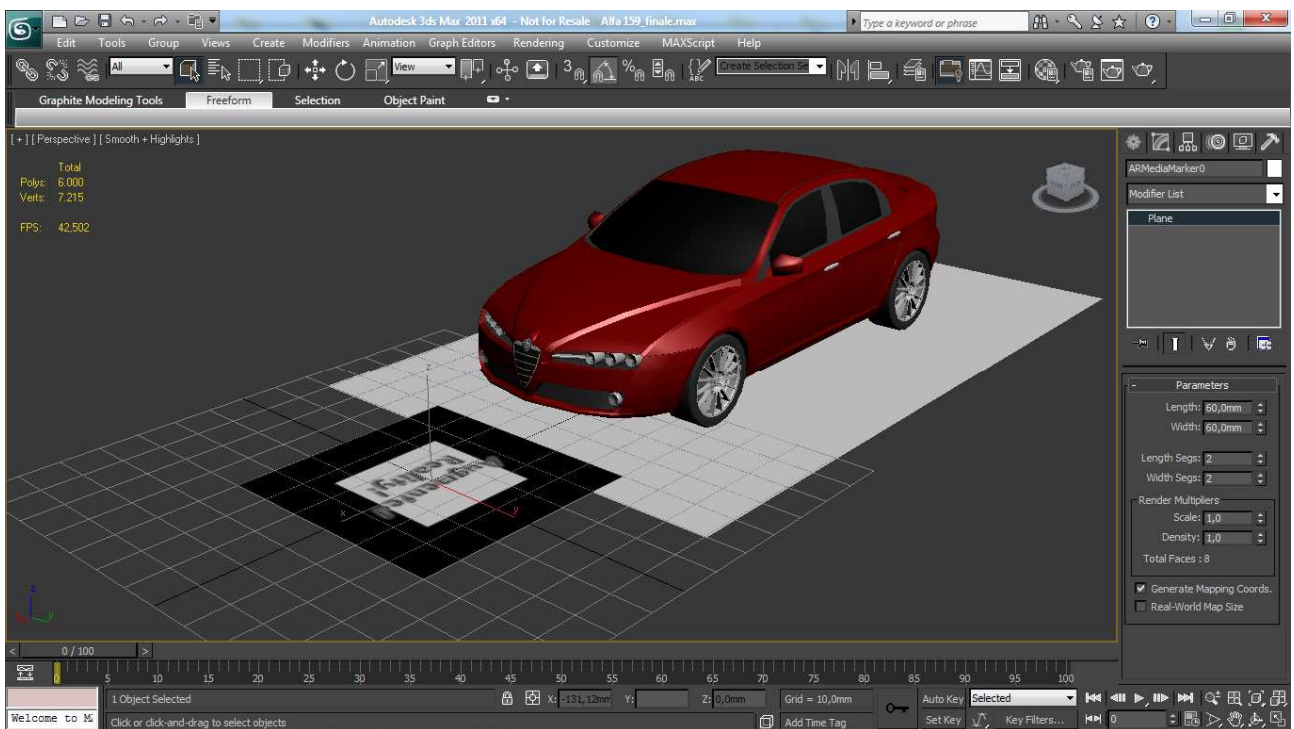
as you can see the model looks like it is floating in air and not like it is standing on the table, because of the missing shadows that we expect. So let's improve this by using a *shadow plane*.

## Step 2: shadows

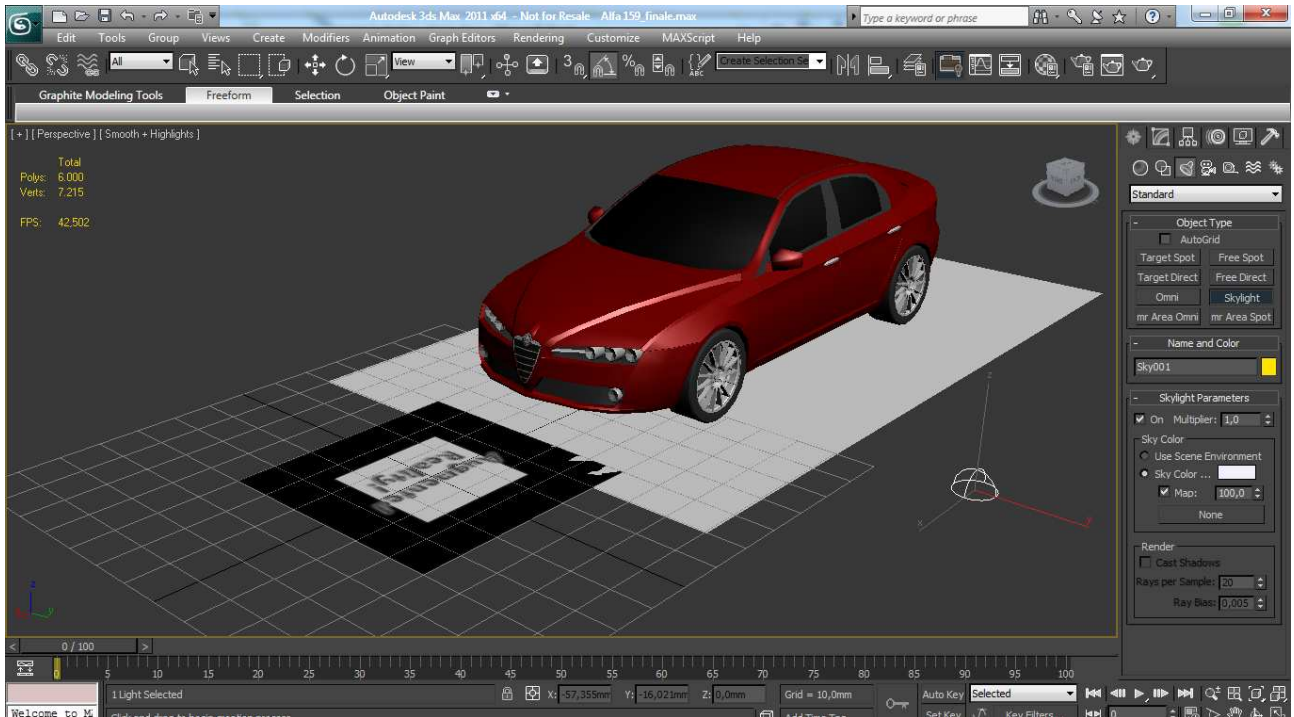
*Creating the shadow plane:* create a **plane** big enough to be able to receive shadows from the model.



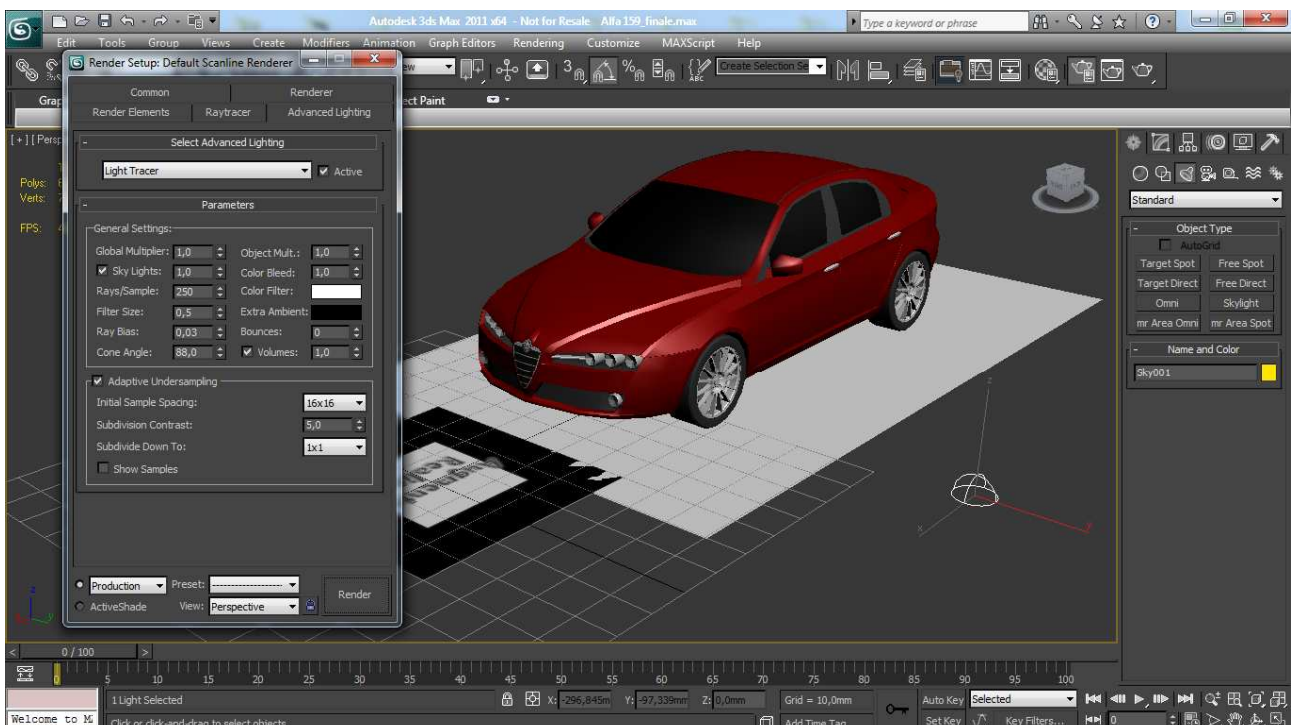
make the plane completely white



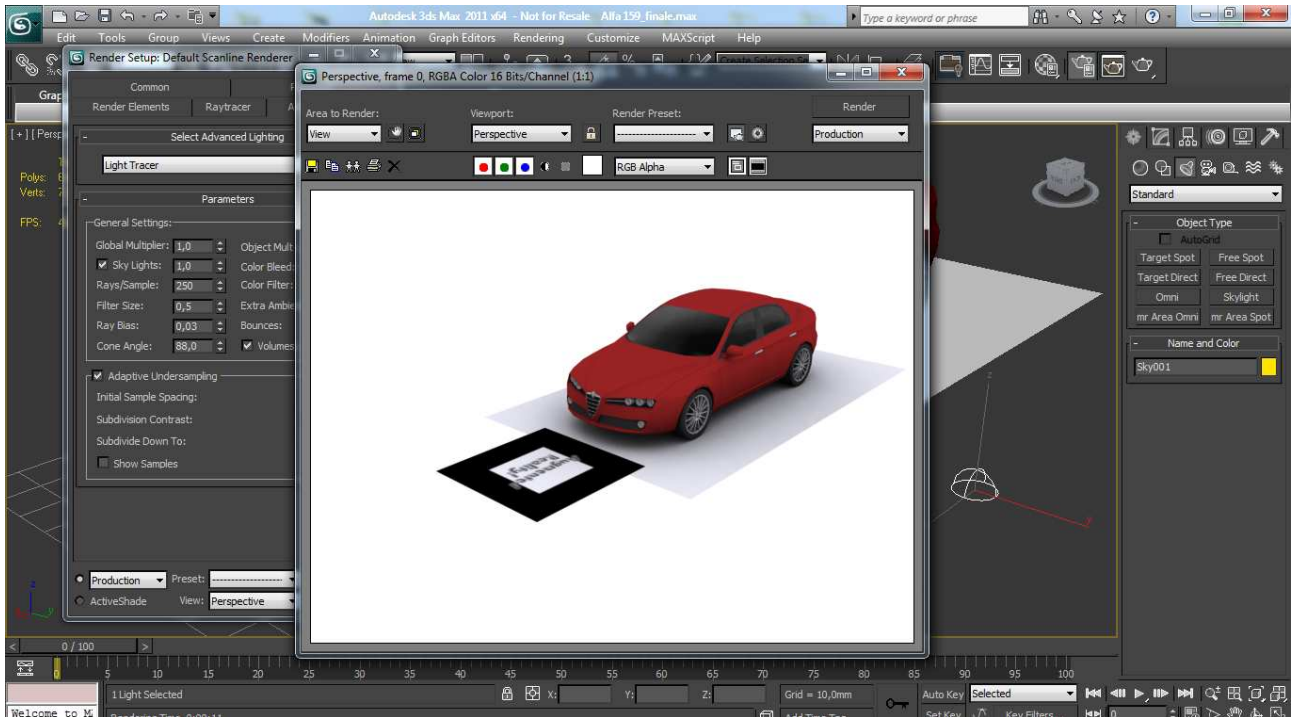
*Creating the shadow effect:* create a standard **Skylight** light, place it anywhere near the model and the plane



we'll use the *Light Tracer* engine that is very good for creating soft-shadows quickly, so click the **Rendering** menu, then **Light Tracer...** and in the window that will open leave the default values, just be sure that in the **Selected Advanced Lighting** rollout, the **Light Tracer** item is selected and the corresponding **Active** option is checked

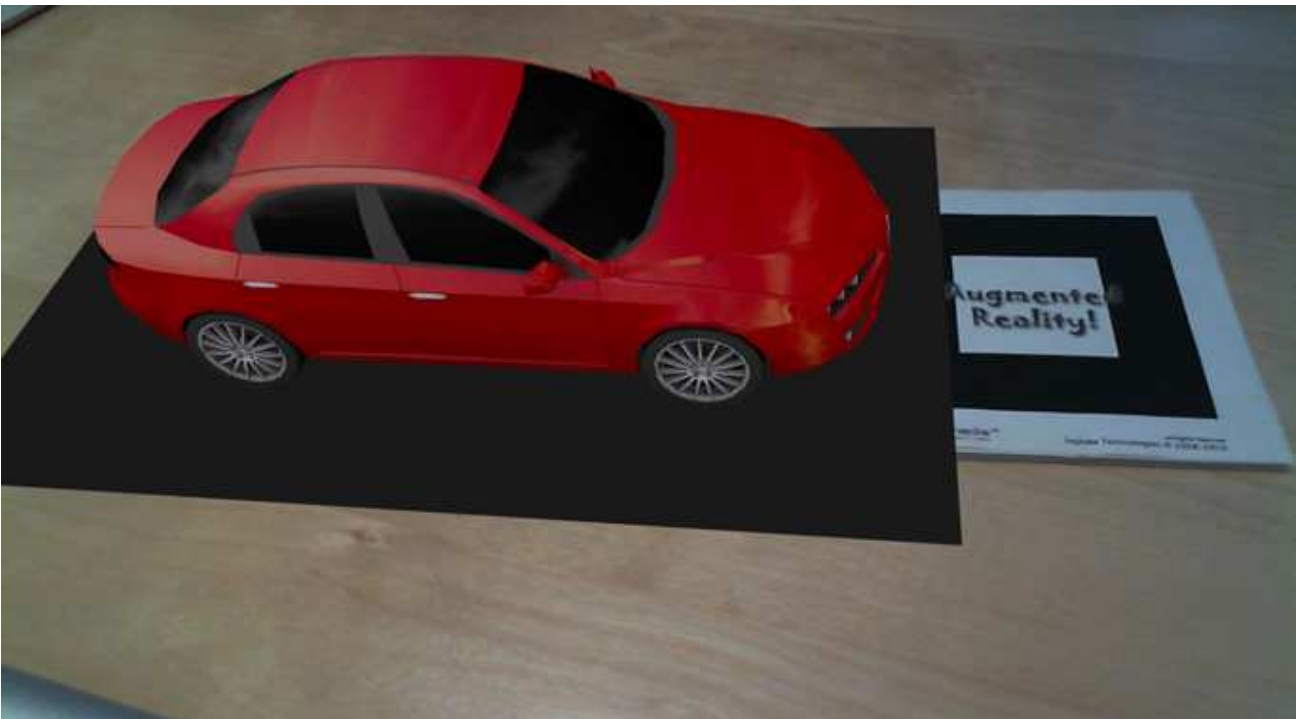


if you try to render the scene you'll see a soft shadow on the plane



of course you can try to adjust the Light Tracer parameters if you want to improve the shadows quality.

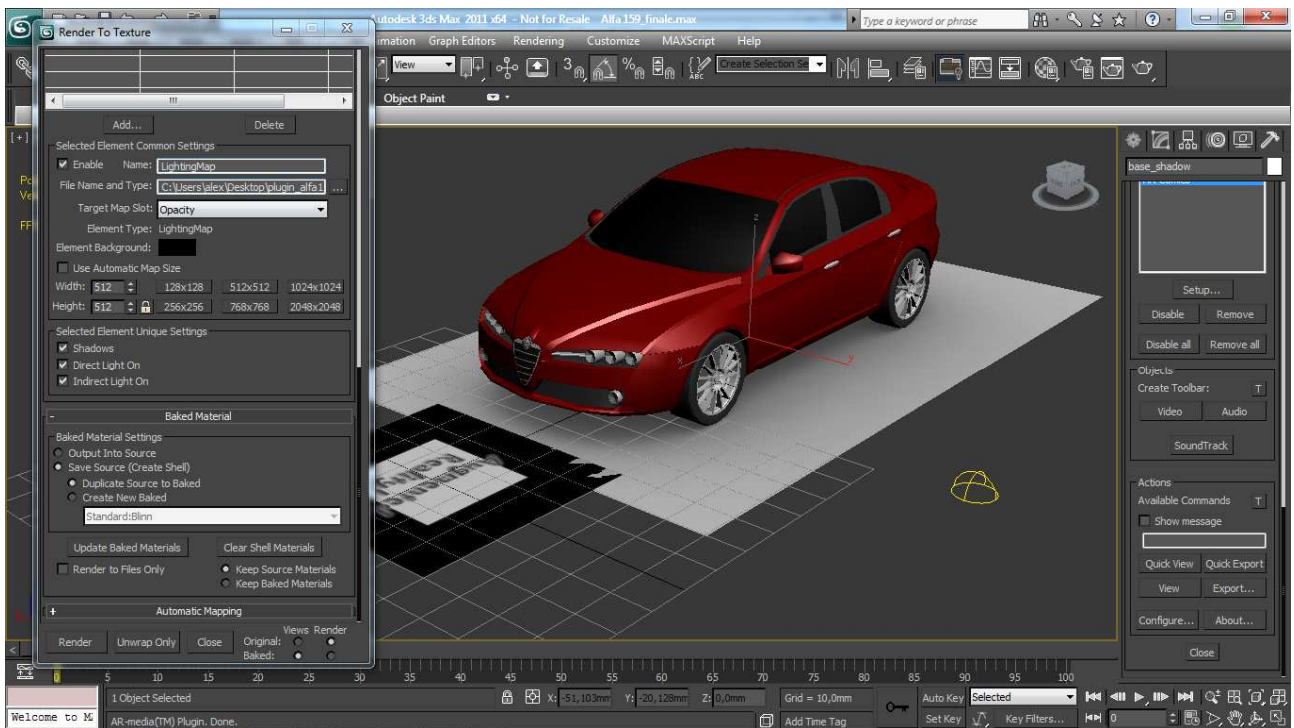
Now if you try to see the model with the plugin you won't get exactly what you expect



since shadows are not fully supported by the plugin, what you need to do is to *fake the lighting information* and the way you do this is by means of the **Render To Texture** command. From the **Rendering** menu select **Render To Texture...**; once the **Render To Texture** window opens, click the plane you've created (it will be added to the list of objects to use); scroll down to the **Output** rollout, click the **Add...** button and select **LightingMap** from the window that will appear; be sure that the **Target Map Slot** contains **Opacity**; choose a size for the lighting map (try 512x512), choose a proper name for the texture file that will be created by clicking the **File Name and Type** slot (choose either the PNG or JPG file format,



but if you choose PNG be sure not to add the alpha channel) and leave any other parameter as it is (if you have already used RTT previously you may have different settings that should be changed to the defaults value in order to have everything work fine)



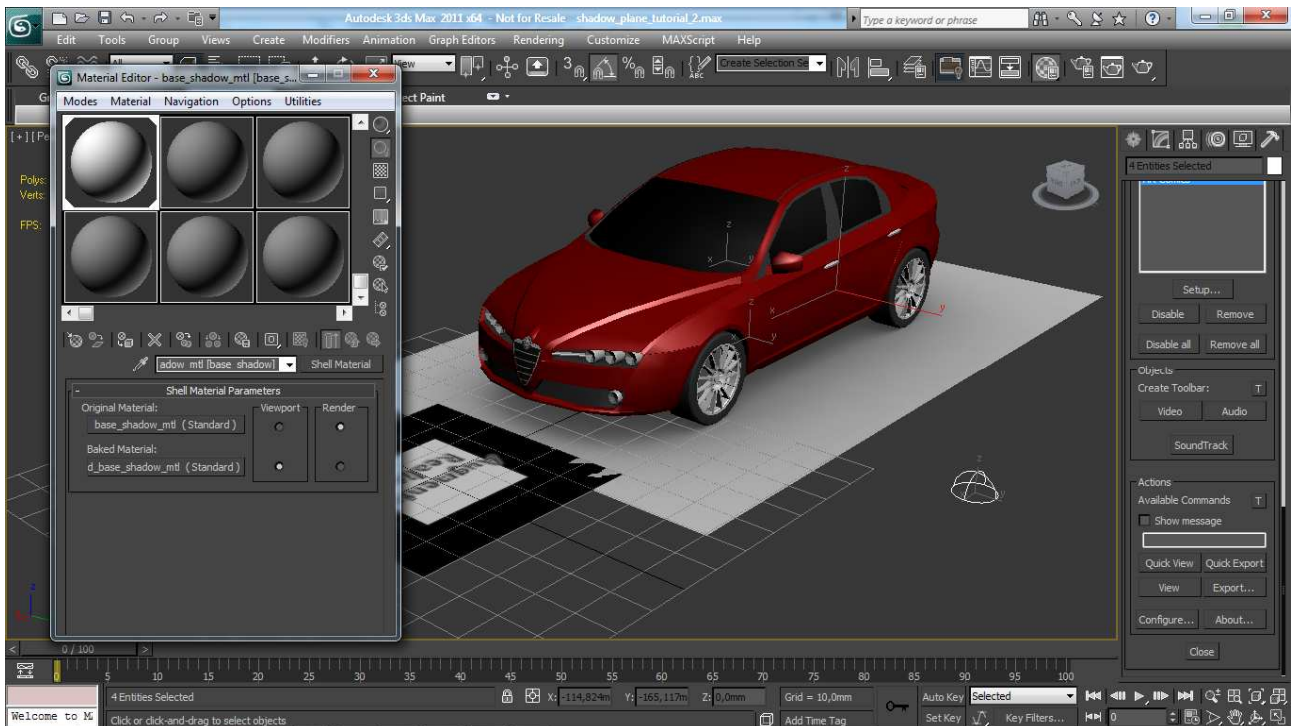
click the **Render** button to start the operation (lighting information will be stored into a texture and a **Shell Material** will be created and assigned to the selected object); you can now close the **Render To Texture** window, and preview the simulation again



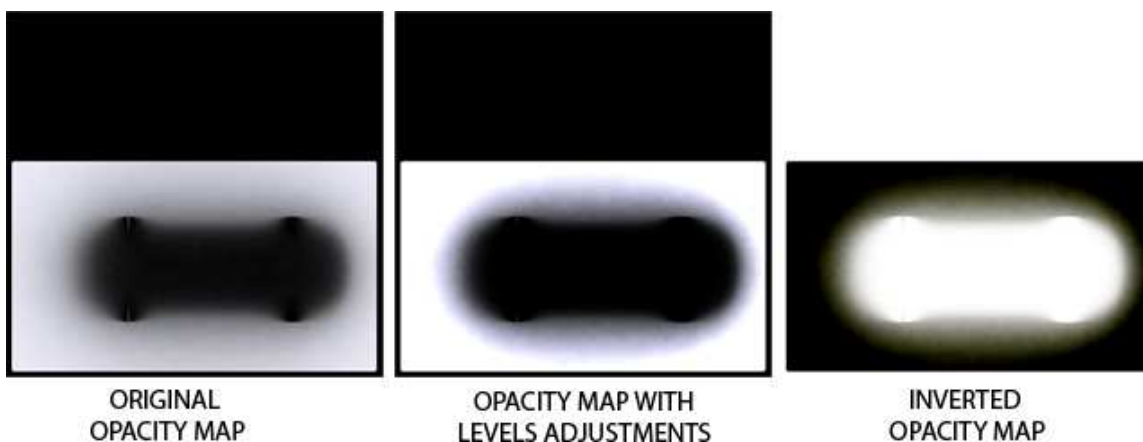
but this is not yet what we're looking for, in order to have the desired result we need to fix the plane material.

### Step 3: materials and lighting

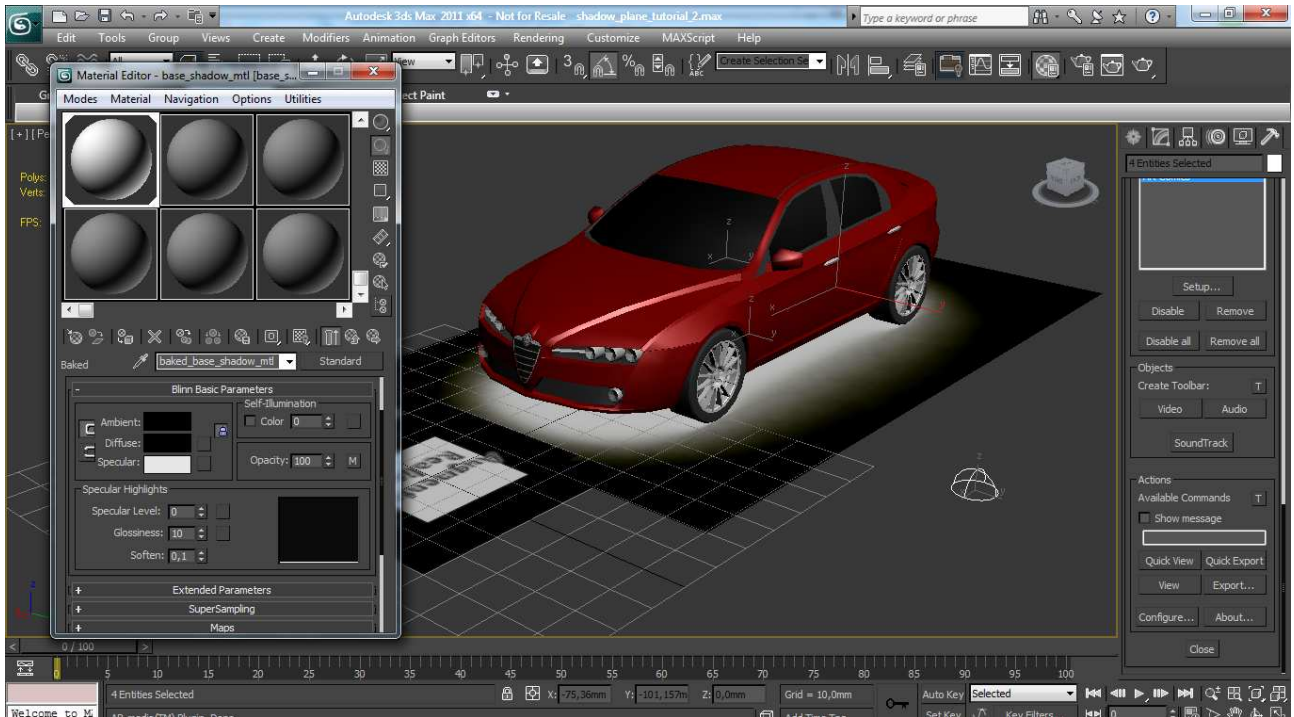
Open the **Material Editor** and pick the plane material from the scene



if the *Render To Texture* command went fine you should have a **Shell Material** in the plane material slot, the **Baked Material** is the one that is used by the plugin, click it; what we have to change is the *shadow color* and also we must fix the texture that has been created by the *Render To Texture* command. Regarding the first point we want black shadows, so just change the **Diffuse** color to black; regarding the second point click the **Opacity** map and then open the corresponding texture file into an editing software, the problem here is that the shadow is not strong enough and that it looks *inverted* (i.e. during the augmented reality experience what should be dark is transparent and viceversa), so, first of all, let's modify the texture image so that shadows will look stronger (adjust levels) and finally invert the image. The process is described by the following images



finally go back in 3ds Max and you should have something like this



now let's see the scene with the plugin again



as you can see the model casts a soft-shadow on the table now (note that, depending on your actual scene, you may need to hide the skylight if you used it only for the purpose of creating the shadow plane and if you don't need it for anything else).

## Conclusion

This technique is very useful to improve the overall quality of your scenes. You can even get more accurate results if you use other lighting engines, the idea is always the same: create a plane, a light and finally use the shadow information of the plane as its opacity map. If your model moves around, you can even link the plane to the model and the soft-shadow will follow it.