



3ds Max® Design: 3 rendering techniques for Inventor users

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VI 5396-L

Learning Objectives

- At the end of this class, you will be able to:
- Render an image in 3ds Max® Design using the mental ray daylight system
- Render a photo-realistic image of an object in a studio setting
- Load a HDRI image to use as lighting and background for your object.
- Know how to adapt your scene for both the iray and mental ray rendering engines.

About the Speaker

Marion Landry has over 18 years of experience in Architectural Visualization, working with a range of software including Autodesk® 3ds Max® Design and Autodesk® Showcase™. She has worked for various architecture firms in Vancouver, BC and on numerous projects from concept design to high-end visualization.

As a Technical Marketing Manager for Autodesk, she focuses on the creation of technical demonstrations and workflows with Autodesk® 3ds Max® Design and Autodesk® Showcase™. She also contributed in the writing of multiple white papers including: *Daylight Simulation in 3ds Max® Design 2009* (Getting started and advance), *Using the Autodesk Civil Visualization Extension for 3ds Max® Design* and AutoCAD Civil 3D and more recently *Easier mental ray rendering for designs workflows*.

You can follow Marion's technical advice and tips & tricks publication on her YouTube channel and on twitter. She also answers technical questions and offer supports on The Area Autodesk Showcase and 3ds Max forum.

Marion is currently enrolled in a Bachelor of Fine Art, major in Painting at Emily Carr University of Art and Design in Vancouver.

YouTube: <https://www.youtube.com/user/LandryMarion>

Facebook: <https://www.facebook.com/MarionLandryArt>

Twitter: <https://twitter.com/MarionLandry>

LinkedIn: <http://ca.linkedin.com/pub/marion-landry/4/a78/258>

Website: <http://www.marionlandryart.com/>

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Workflow from Inventor

The import/export workflow will not be reviewed in class as I am assuming that you are familiar with this workflow. If you are not, you can find out more information by watching these two videos:

<http://youtu.be/k0vqybvdv4Rk>

<http://youtu.be/r0A37M-btYw>



The mental ray rendering engine

The mental ray rendering engine will be used in this lab but not thoroughly explain. If you are not familiar with mental ray, I highly suggest you read section 1, 2 and 3 of this document prior to the class:

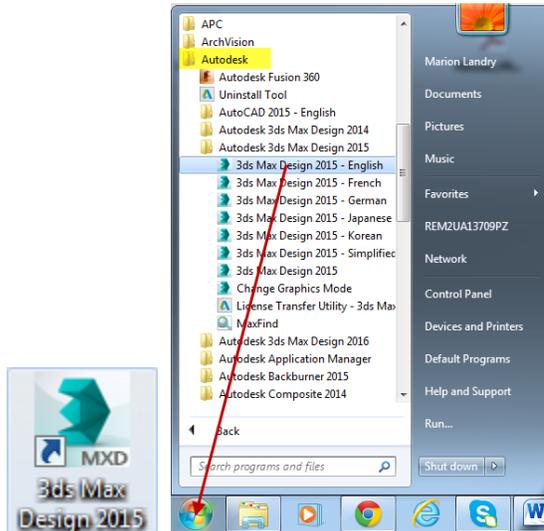
http://images.autodesk.com/adsk/files/mental_ray_white_paper_2012_en.pdf



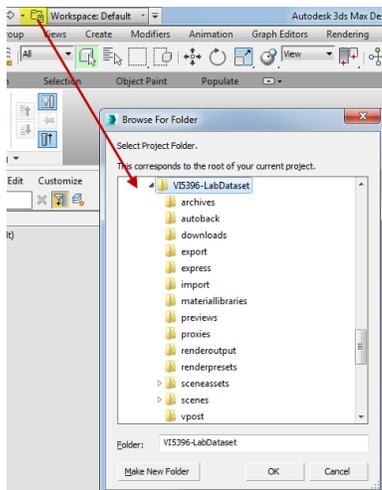
Preparation before lab

Before the start of the lab, please set the 3ds Max® Design project folder by following these steps.

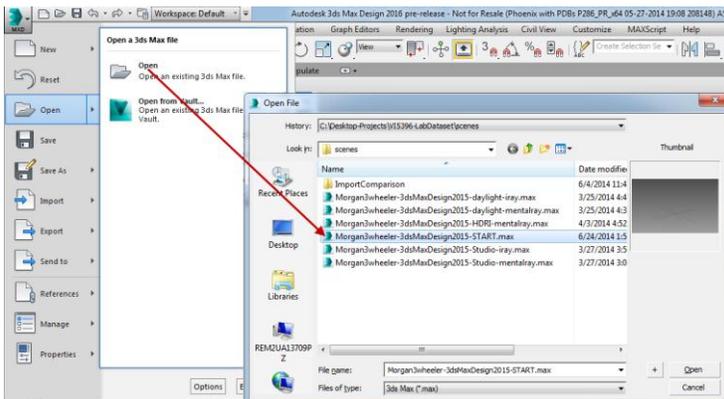
- 1- Open 3ds Max® Design 2015 by either clicking on the desktop icon or finding the software via the start button



- 2- Set the project folder to VI5396-LabDataset. Click the Set Project Folder icon in the quick access bar. Refer to the path provided by the Presenter.



- 3- Click the Application button to access the open file. Open the scene title: Morgan3wheeler-3dsMaxDesign2015-START.max



4- You are ready to go.

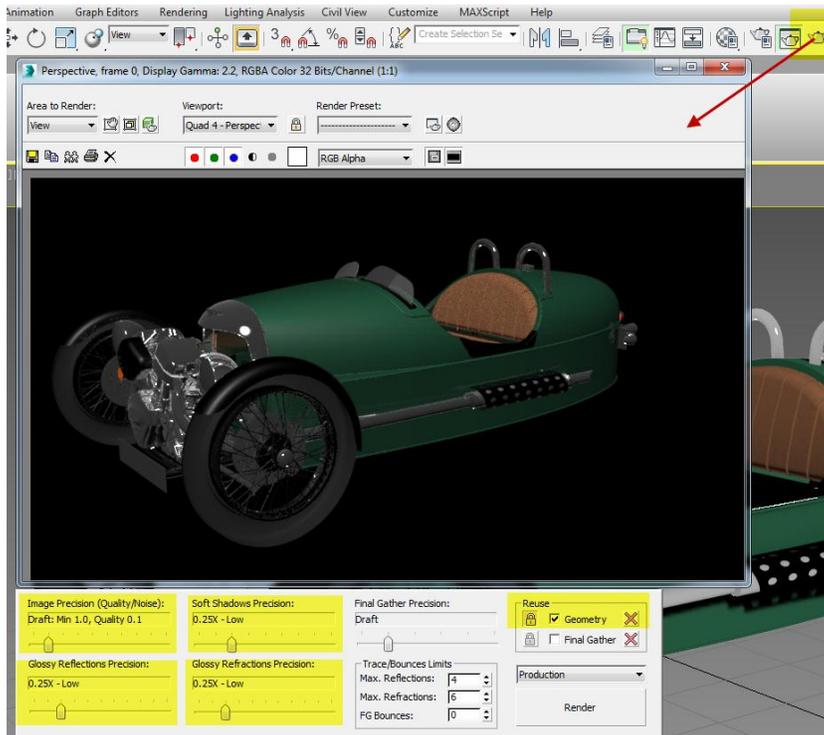
Understanding the scene

This scene was prepared specifically for this lab. To review the presets that were used to import this scene from Inventor, watch this video: <http://youtu.be/r0A37M-btYw>



After the import, few modifications were applied to the scene including:

- Layer organization
- Materials management (duplicated or similar materials were deleted or merged)
- Rendering output is set to 800 x 450 pixels using low quality rendering settings to speed up rendering process during the lab. Notice also that the Reuse Geometry is locked, this will save translation time during the rendering process. If you are planning to modify the geometry, you will need to unlock and uncheck this option to see the change in the render. To learn more about read this: <http://help.autodesk.com/view/3DSMAX/2015/ENU/?guid=GUID-7EAC8511-ABFD-4446-AB77-89769E91483D>
- The safe frame is active in the viewport, so you see the rendering window frame or the area that will be rendered.



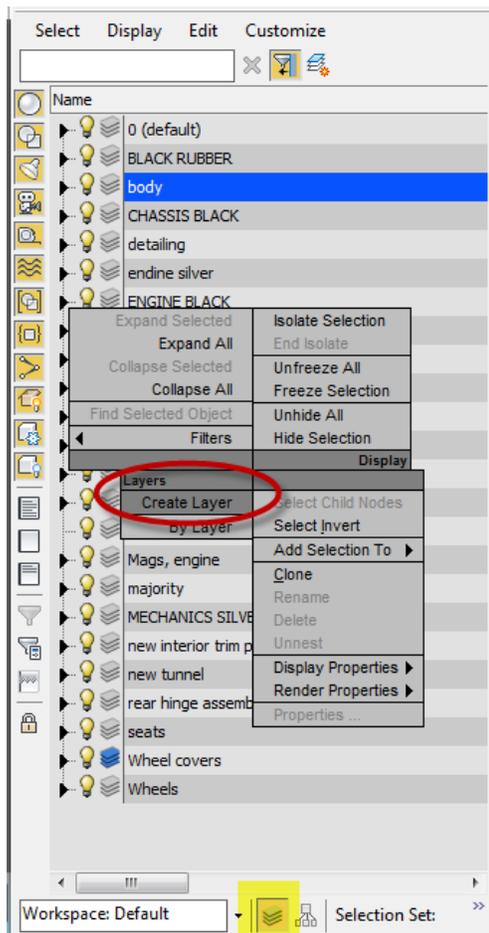
You can click the rendering button to view the scene as it is. Not really exciting right? Let's start!

Option #1: Daylight System rendered with mental ray

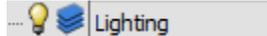
<http://youtu.be/6ywgVRH4BR4>



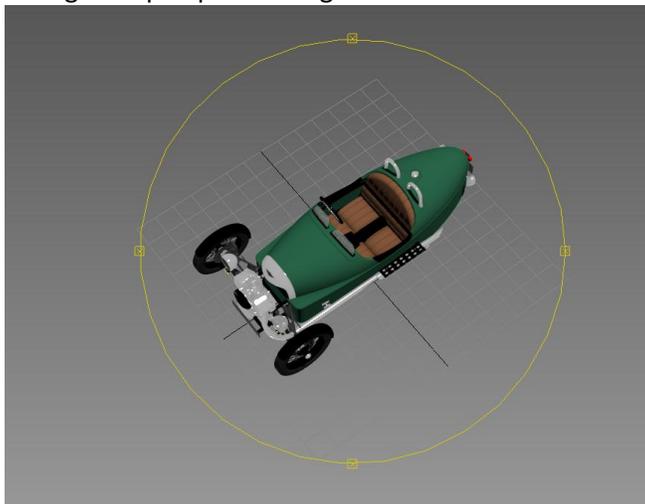
1. Create a layer. Personally, I like to organize my scene by layers so I suggest starting by creating a layer on which the daylight system will be nested. Make sure that the scene explorer is sorted by layer, then right click in the scene explorer and choose the option "Create Layer" from the Layer Quad Menu.



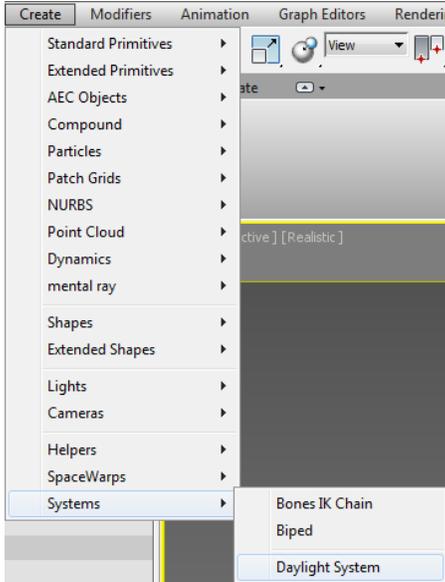
2. Rename the Layer: **Lighting**. To rename the layer, right click on it and choose the option to rename. Make sure that the layer is active by double clicking on it. The layer icon will show in blue to indicate that this layer is now active.



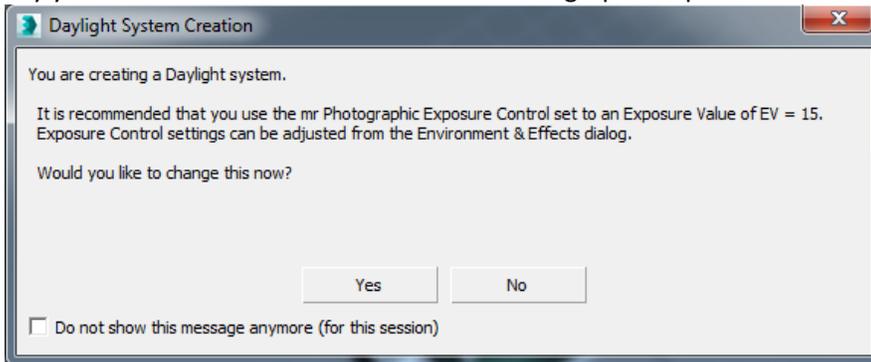
3. Change the perspective angle to see the model more from a top view:



4. Create a daylight system: Go to the Create Menu> Systems>**Daylight System**

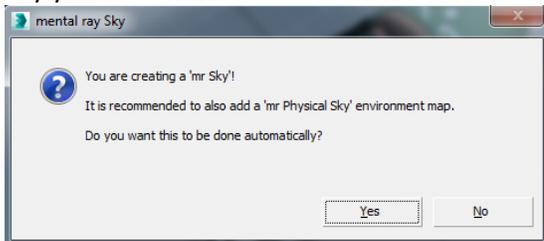


Say yes to the first window about the mr Photographic Exposure Control.



Click and drag in the viewport to draw the compass.

Say yes to the second window about the addition of a mr Physical Sky environment map.



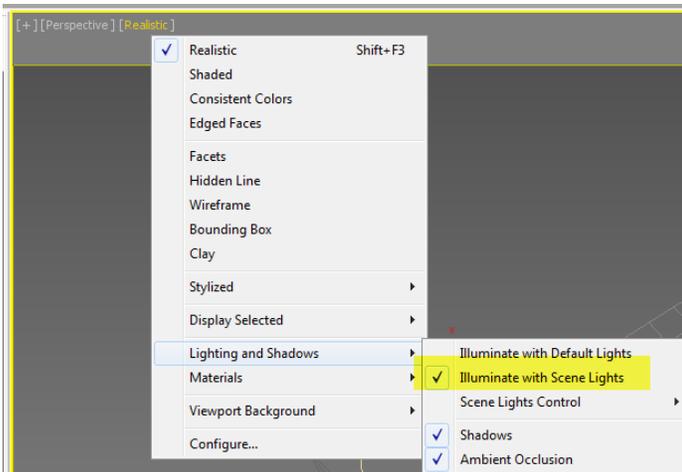
Click again to drop the sun and terminate the action.

Looking at your layer, you should now see a compass, a daylight system group and a Sky and Sun.

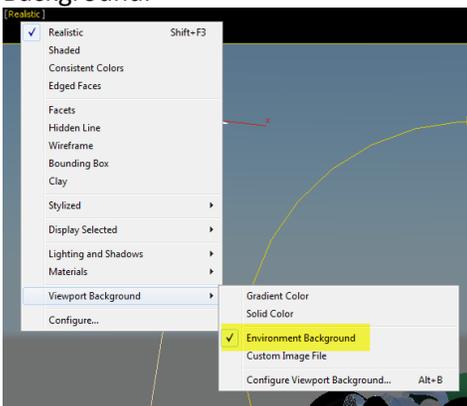


The location of the daylight system in your scene is irrelevant as the light information will be driven by the date, time and location settings of the mr daylight system.

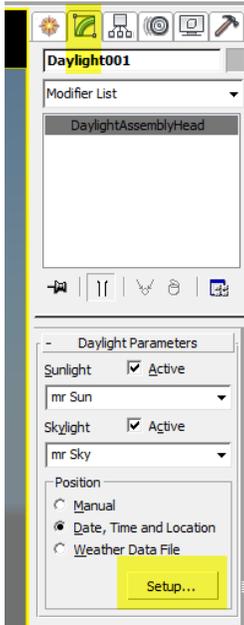
- To view the effects of the light and shadow in the viewport, go to the viewport 3rd menu, choose the Lighting and Shadows option to “Illuminate with Scene Lights”. Make sure that the viewport is set to Realistic.



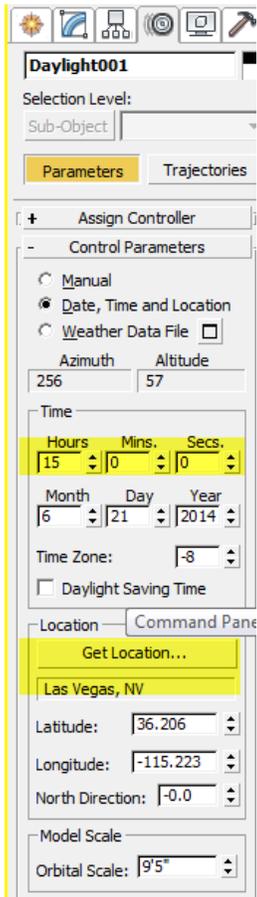
- To view the effect of the sky, turn on the Viewport background option to Environment Background.



- Adjust the daylight system settings. With the daylight system selected, go to the control panel Modify Tab. Click on the Setup button.

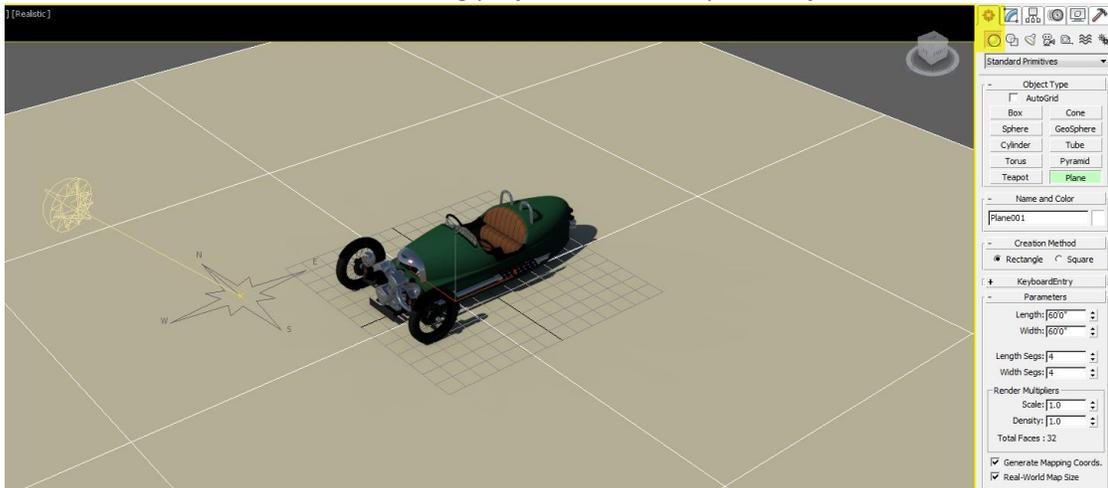


8. Change the time of the day to be 3pm in the afternoon (15:00) and get Las Vegas for the location.



Notice that when you change the time, you can see the shadow moving in the scene. It is still a bit difficult to really see the shadow moving in the scene due to the fact that there is no object underneath the 3 wheeler to receive the shadow.

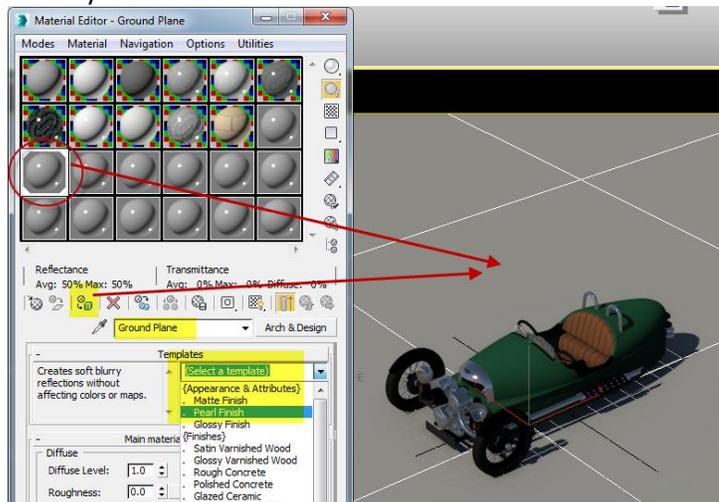
9. Create a ground plane. Click on the create tab of the control panel and choose the Standard Primitive menu. Click on the Plane object and drag and drop a plane onto your scene. You now see the shadow of the 3 Wheeler being projected onto the plane object.



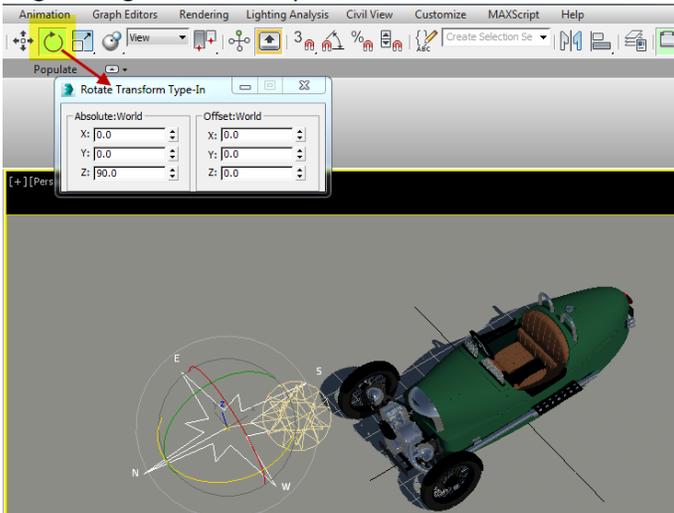
10. Apply an Arch&Design material to the ground plane. Open the Material Editor, make sure that you open that mode and not the “Slate” mode:



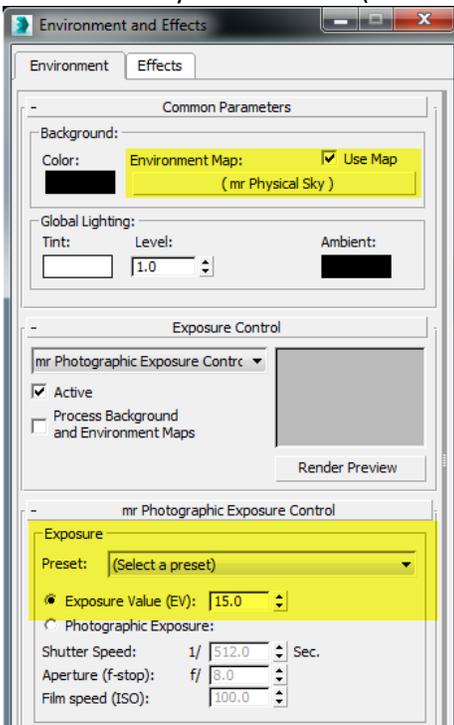
Choose an Arch&Design material from the material editor list and apply it to the ground plane. You can drag and drop the Material or use the Assign Material to Selection icon. Use a Pearl Finish template. You might want to rename the Material to “**Ground Plane**” so it is easier to identify it later.



11. You can choose to change the orientation of the sun by rotating the compass. Changing the time of the day will not affect the sun orientation. Select the compass and the rotate tool. Add a 90 degree angle to the compass

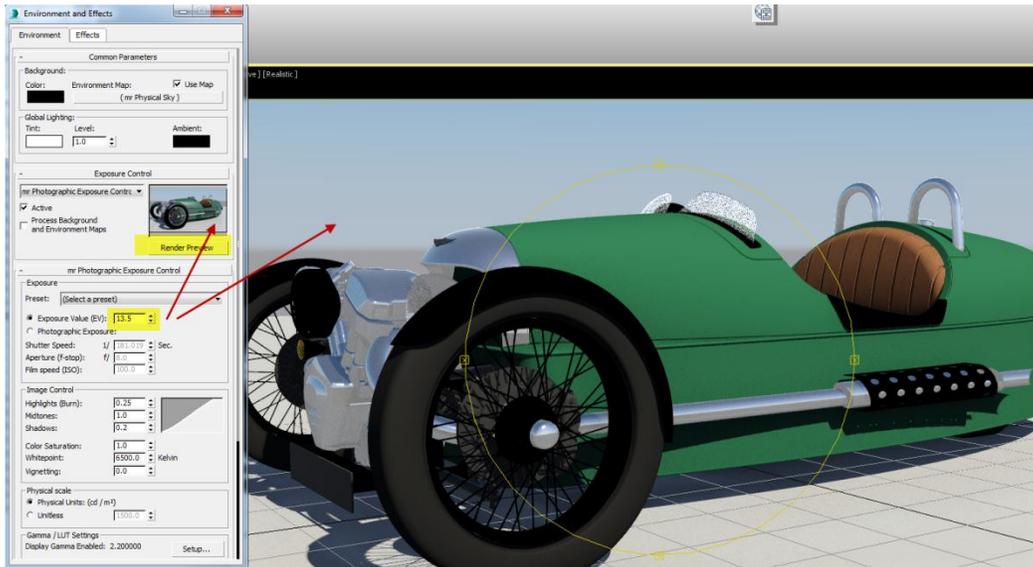


12. Adjust the exposure control to match the time of the day. Go to the Rendering Menu> Exposure control. Here you will see that a mr physical sky was added automatically and that the exposure has been set by default to 15. (Refer to step 4)

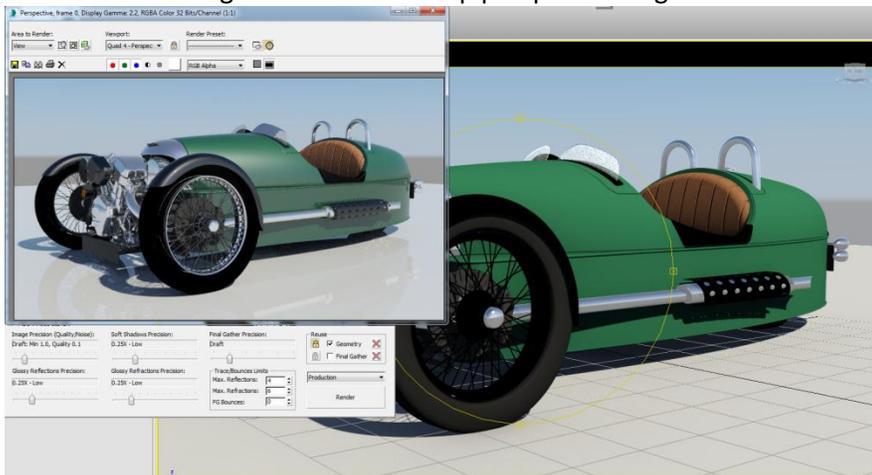


You can choose to render a preview in this window.

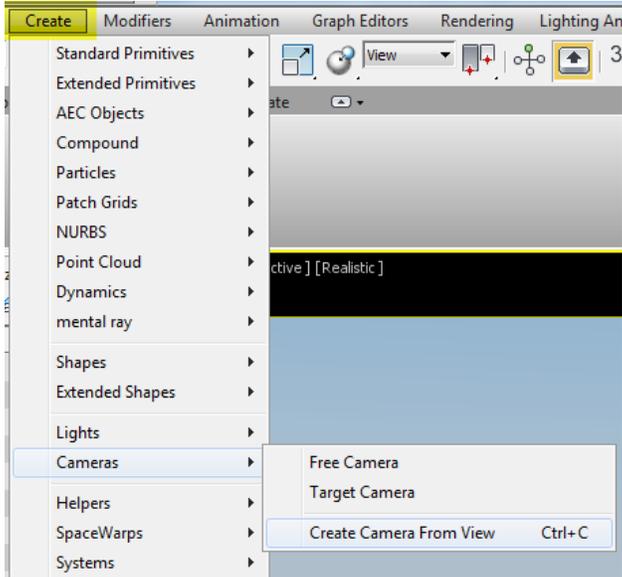
If you have set up the daylight system time to 3pm, you should set the exposure value to 13.5
Notice the change in both the viewport and the Render Preview window.



Render a final image. Choose a close up perspective angle and click on the render button.



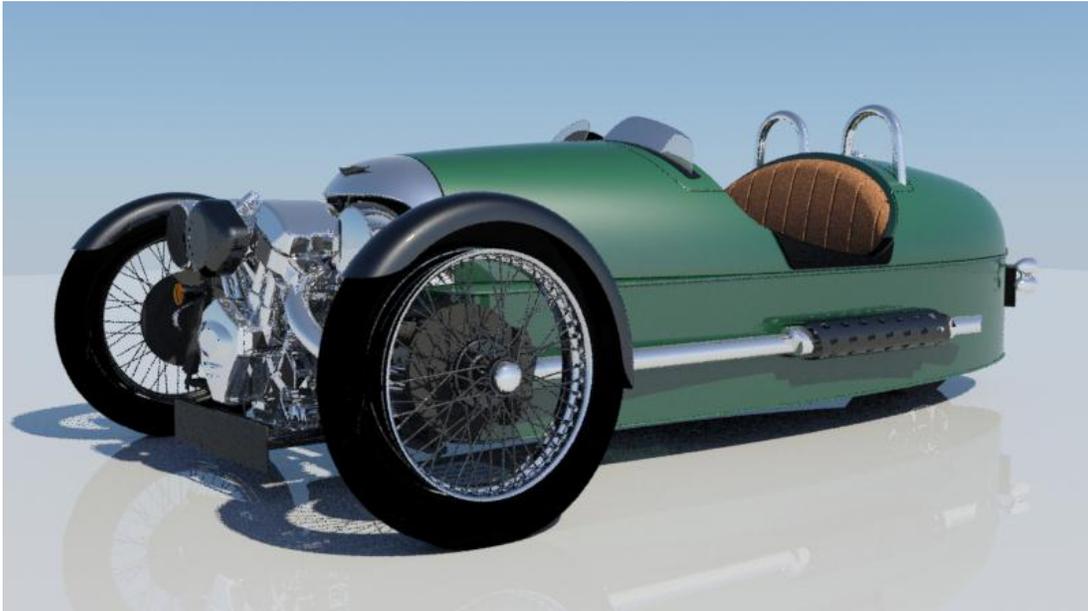
13. Create a camera from the perspective view. Choose a camera angle that you are happy with. Go to the Create menu> Cameras>Create Camera From View. This will create a camera to match the perspective view.



14. Change the daylight system horizon height. Select the daylight system and go to the control panel Modify Tab. Scroll down to the mr Sky Advanced Parameters. Change the Horizon Height to a negative value that hides the grey ground color below the ground plane.



15. Re-Render the final image. You should get something similar to this:



16. This scene was saved as: **Morgan3wheeler-3dsMaxDesign2015-DaylightMentalRay.max**

Option #2: Daylight System rendered with iray

<http://youtu.be/w8Ppb7pbAg0>



The NVIDIA® iray® renderer creates physically accurate renderings by tracing light paths. It requires little setup compared to mental ray. The principal approach of the iray renderer is time-based; you can specify the length of time to render, the number of iterations to compute, or you can simply launch the rendering for an indefinite amount of time and, stop it when you are satisfied with the appearance of the result.

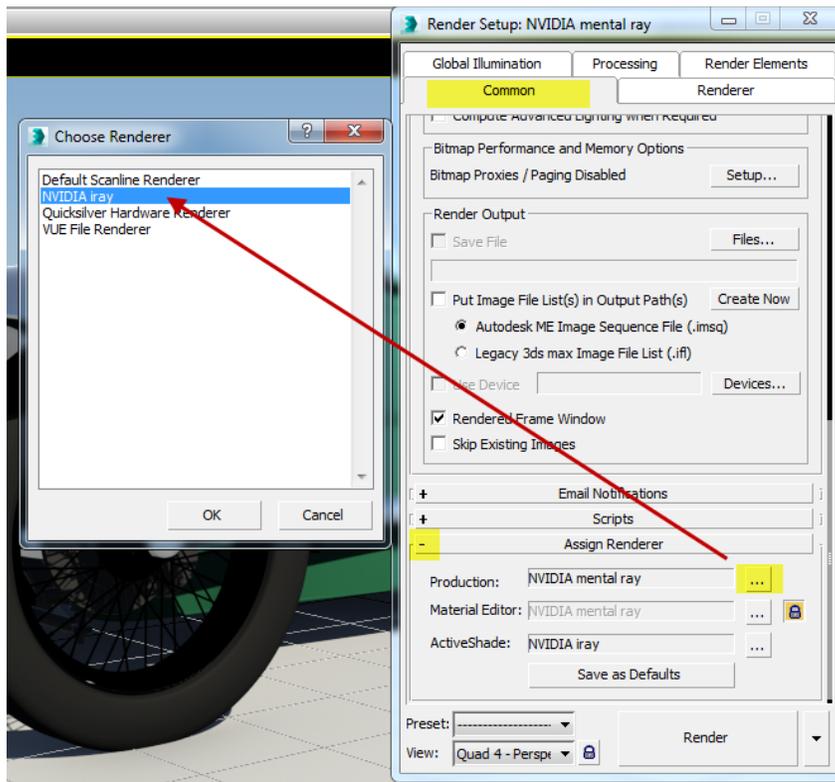
To find out more about iray, read this:

<http://help.autodesk.com/view/3DSMAX/2015/ENU/?guid=GUID-7A77F5E1-5F70-484E-8F27-C8535459D0A3>

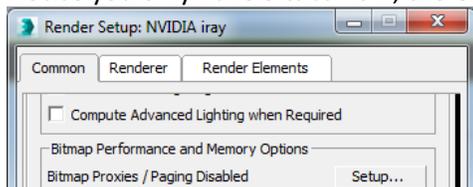
1. You can either continue with the same scene or open the scene name: **Morgan3wheeler-3dsMaxDesign2015-DaylightMentalRay.max**
2. Switch the rendering engine to iray. Click on the Render Setup window icon on the top right corner of the UI menu.



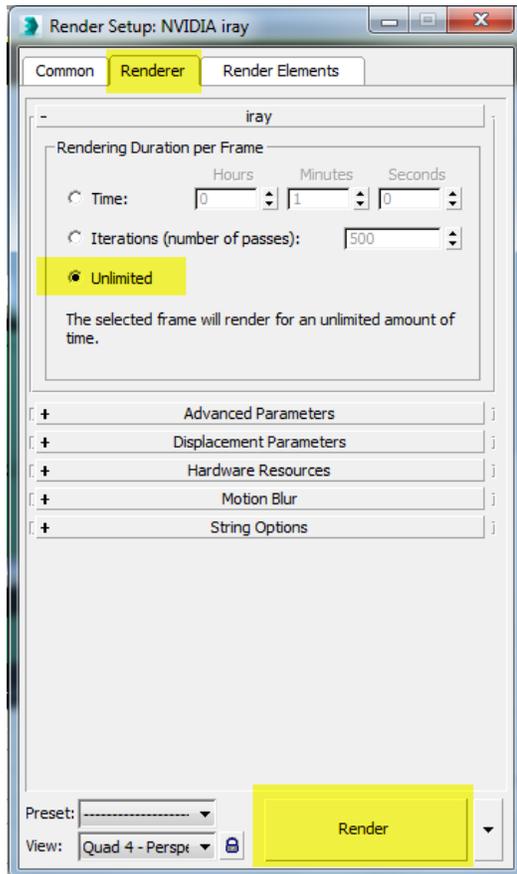
3. Expand the “Assign Renderer” section under the Common Tab. Click on the box with three dots next to the Production NVIDIA mental ray window. Choose NVIDIA iray from the list of renderers.



4. You will notice that the Render Setup window will adjust to display the iray rendering settings. Notice you only have 3 tabs now; the Common tab, Renderer and Render Elements tab.

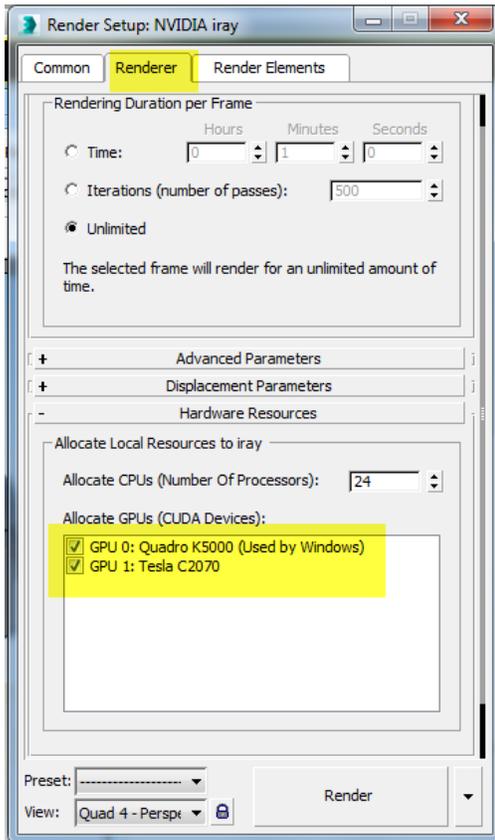


5. Click on the Renderer Tab and choose to render for an unlimited amount of time and hit render.

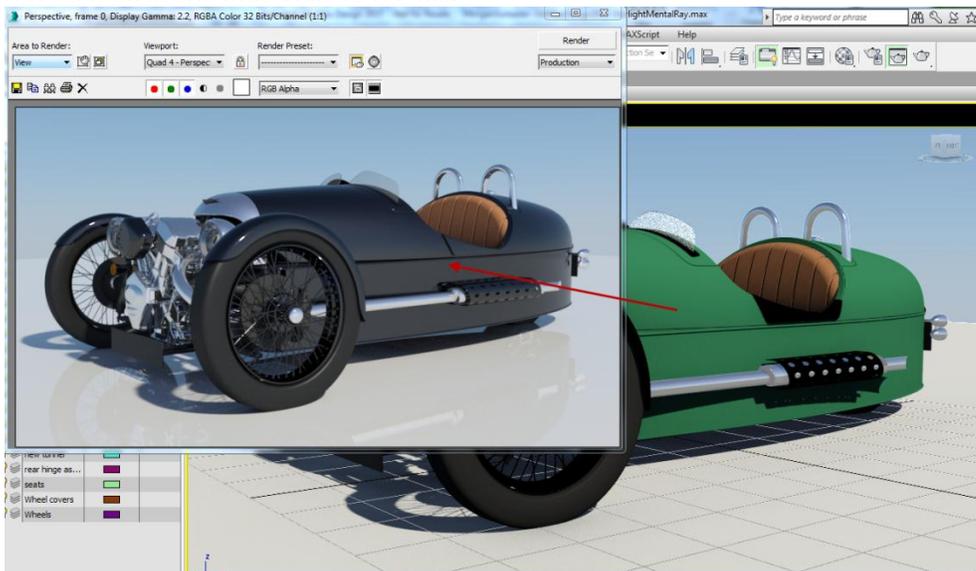


Depending on the speed of your computer, you will first get a granular render that will get refined overtime. Stop the render once you are satisfied.

6. Iray is GPU dependent. You might want to check what kind of graphic card you have available on your computer and make sure that all the resources are active. Go to the Render Setup dialogue, renderer tab and expand the Hardware Resources section.



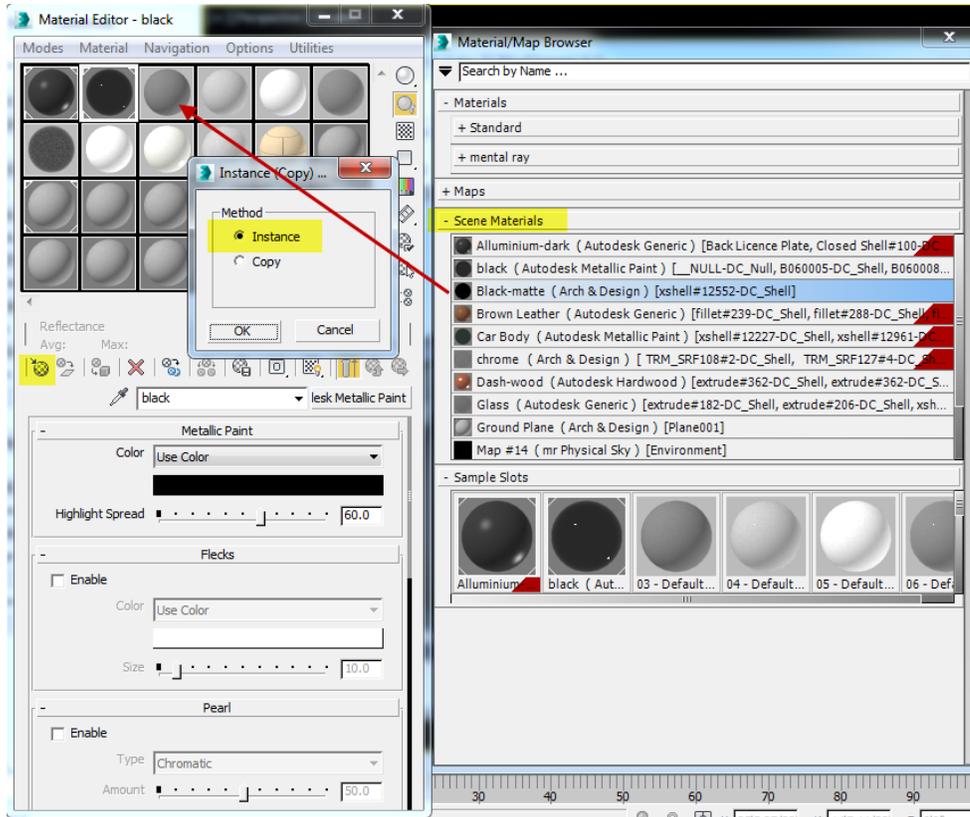
7. Noticed that the Iray render result is different than the viewport model. Mainly the car body is supposed to render green and it is rendering black. This is due to the fact that only physically based materials are supported with Iray. The unsupported materials will render black. So let's have a look at the materials to fix this.



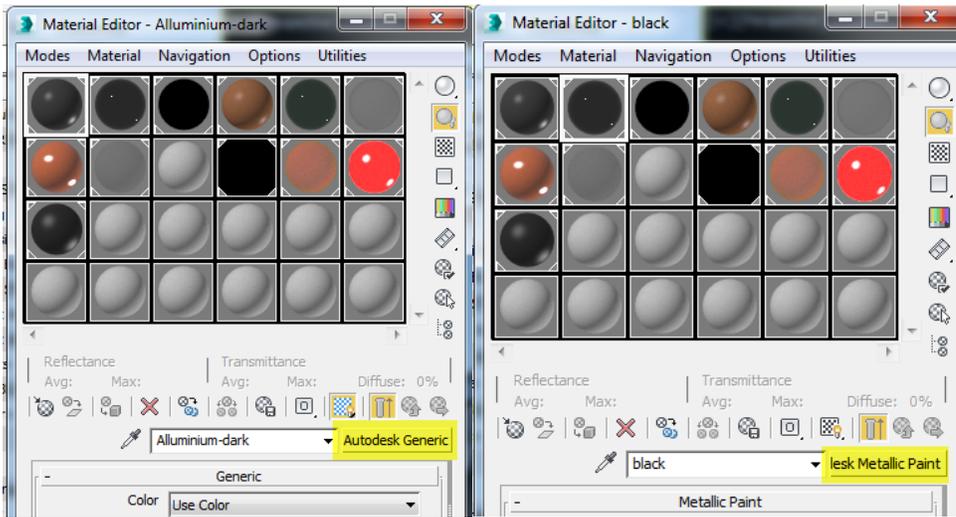
- Open the Material editor by clicking on the icon from the Main menu bar.



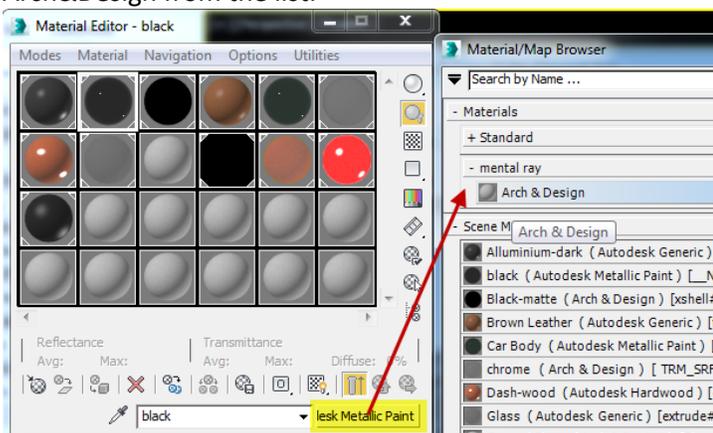
- We will load the scene materials in the Materials editor to investigate a bit more. From the Material editor, click on the “Get Material” icon to access the Material/Map Browser. From the Material/Map Browser, scroll down and expand the Scene Materials section. Drag and drop each of the scene material in an empty material slot and make sure that you are choosing “instance” as the mode.



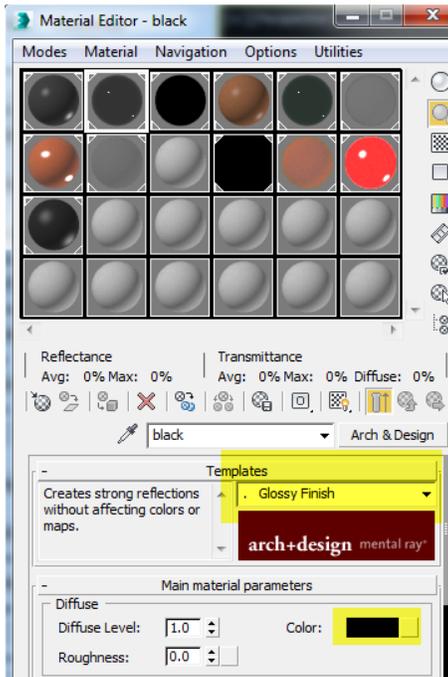
- While looking closely at each of the materials settings, you can see what type of material they are composed off. Few materials are not supported by iray including the Autodesk Metallic Paints. The Black Material is in fact is an Autodesk Metallic paint material and therefore not supported.



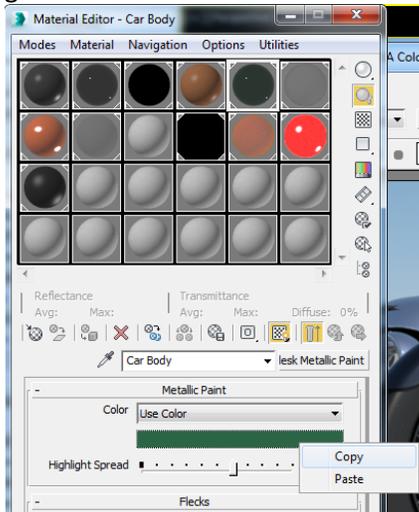
11. Select the Black Material, click on the Autodesk Metallic Paint button. This will open the Material/Map Browser. Under the Materials list, expand the mental ray section and choose Arch&Design from the list.



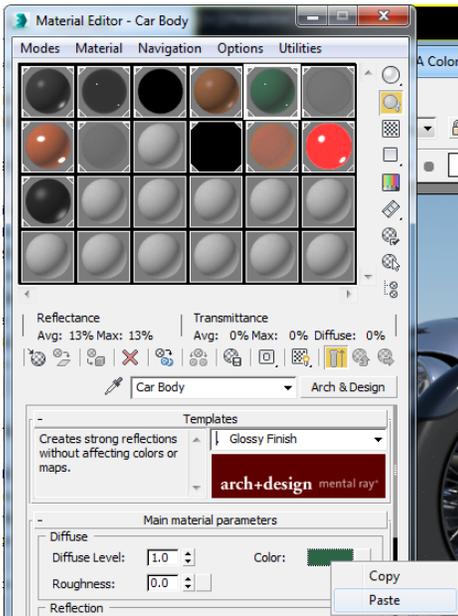
12. Choose a Glossy Finish Template and change the colour to Black.



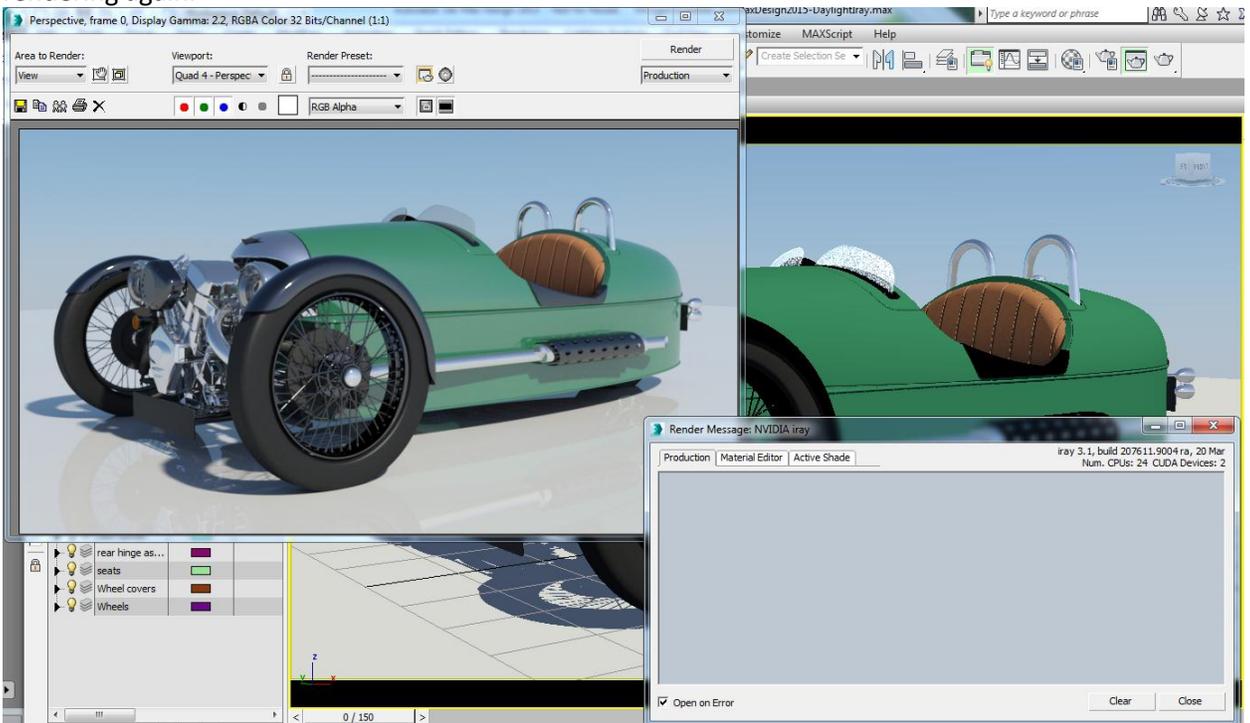
13. Select the Car Body Material. Before changing it to an Arch&Design material, first copy the green color.



Then repeat the same process of changing to material to an Arch&Design material, select the Glossy Finish and paste the green colour in the colour swap under the main material parameters section.



14. Try to render again. You can open the render message window (rendering menu>Render message window) to make sure you have no error messages. If you do, fix the errors before rendering again.



This scene was save as: **Morgan3wheeler-3dsMaxDesign2015-DaylightIray.max**

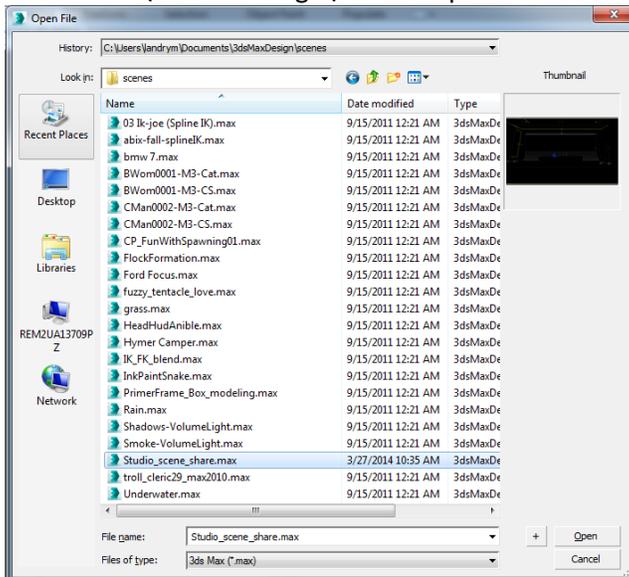
Option #3: Studio light setup rendered with mental ray

<http://youtu.be/cNI7Wy26sz8>

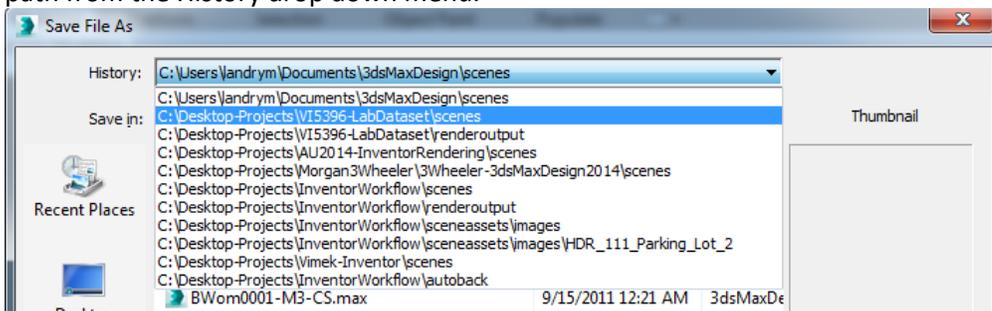


This rendering option includes the use of 3ds Max® Design Sample scene provided and installed with the software. You can access the sample scene via the “Welcome Screen” or open it by browsing to the sample folder. Documents\3dsMaxDesign\scenes

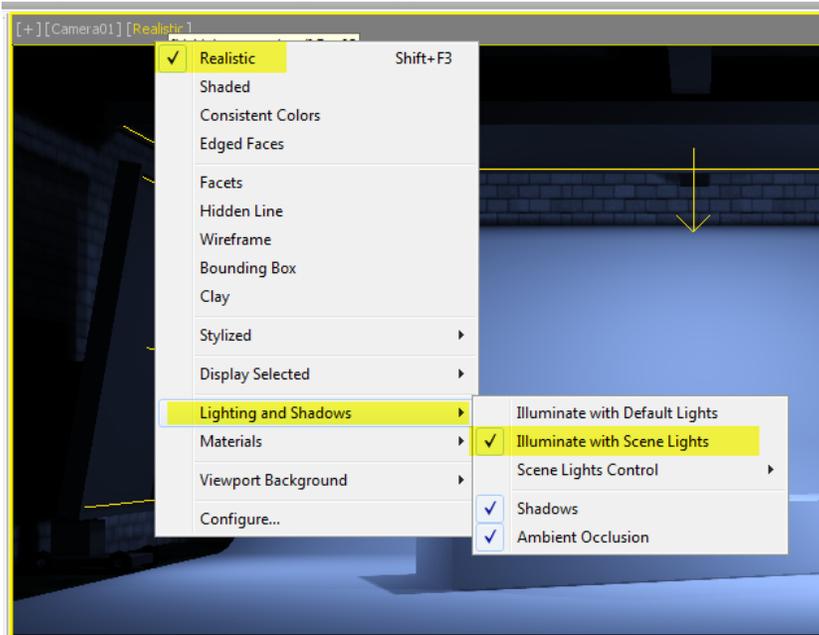
1. Go to the Application button>Open and Navigate to the folder: Documents\3dsMaxDesign\scenes. Open the scene title: **Studio_scene_share.max**



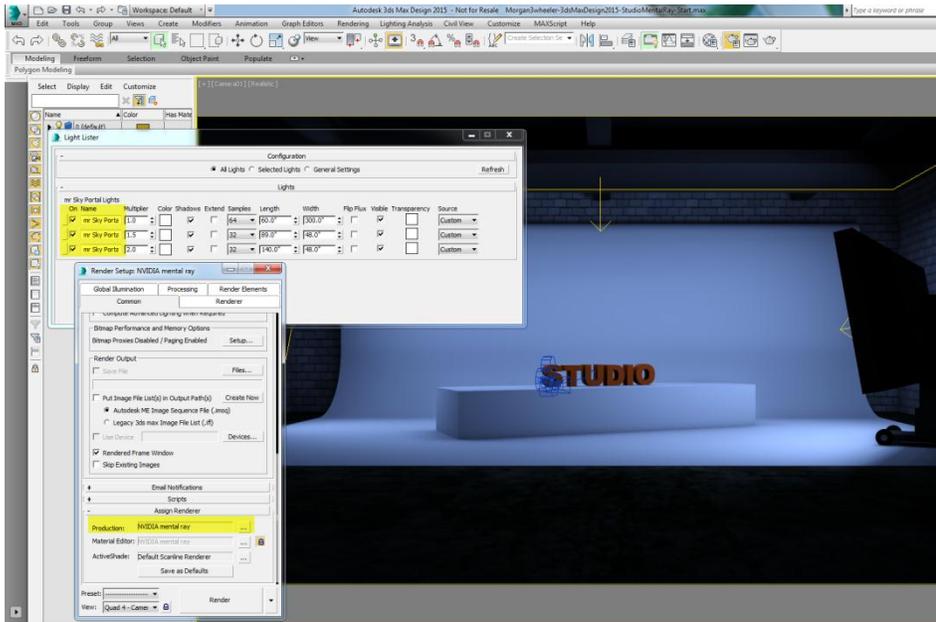
2. To avoid overriding the sample scene, resave the scene under your project folder by going to the Application button> Save> Save as... From the “Save File As” window, select the project folder path from the History drop down menu.



3. Then rename the scene as you wish. This step was saved under: **Morgan3wheeler-3dsMaxDesign2015-StudioMentalRay-Start.max**
4. For now the scene appears dark. To help visualize the scene directly in the viewport, go to the viewport menu and change the appearance to: Realistic and Illuminate with scene lights.

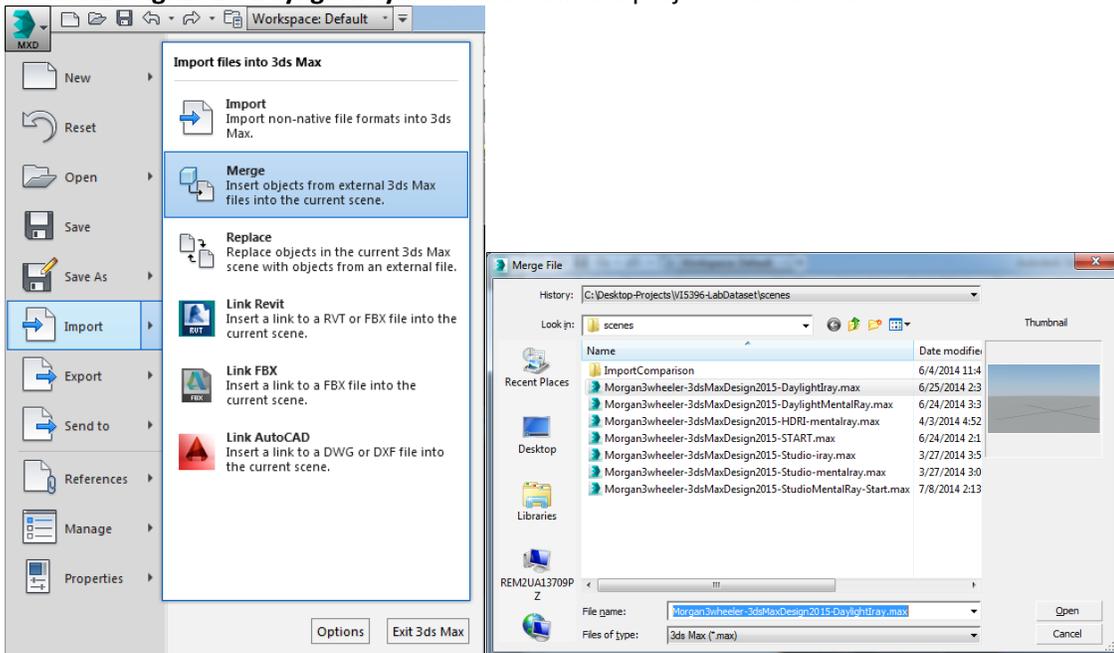


5. To explore the scene without changing the cameras that are already set, it is better to do so from a perspective view. Press the letter "P" to go to a perspective view. This scene offers a basic studio lighting setup using 3 mr Sky Portal, two cameras and is set to render with mental ray renderer. This scene can be used to import your inventor model directly into the studio space either using the podium or not. Because we are working with a car, we won't need the podium but will leave it in the scene for now to use as a guide to position the car.

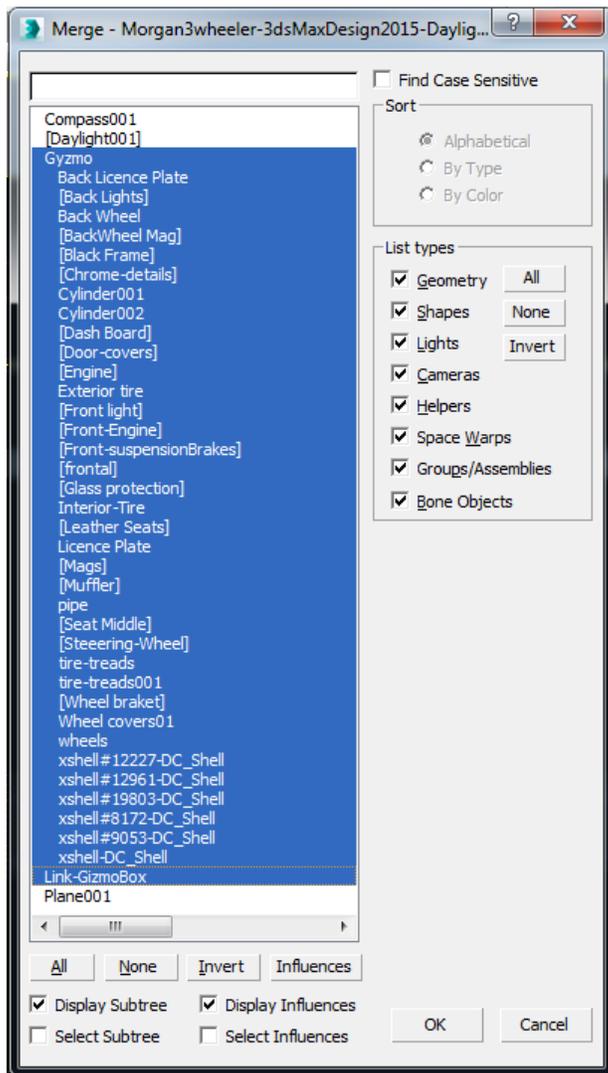


Let's merge the car from our previous scene. The reason I am choosing to merge rather than import a new Inventor model is because merging is a faster process than importing. Additionally, changes have been made to the 3 wheeler scene including materials supported by the iray renderer. To avoid having to redo these steps, we will merge the scene that is fixed already.

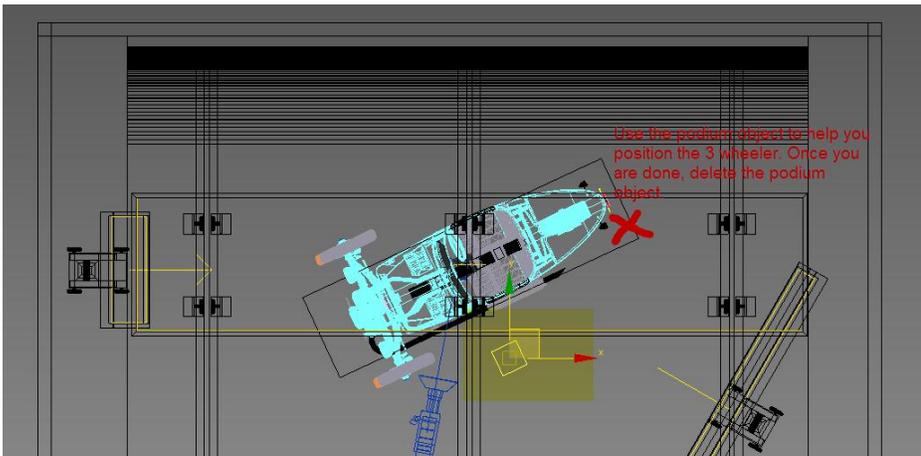
- Go to the Application Button>Import>Merge and choose the scene **Morgan3wheeler-3dsMaxDesign2015-DaylightIray.max** located in the project scenes folder.



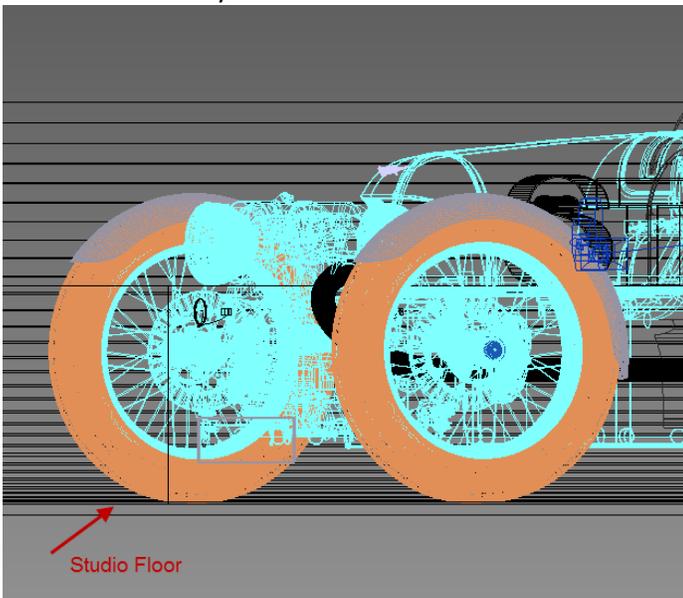
- From the merge window menu, select all objects in the scene except for the **Compass001**, **Daylight system** object and the **Plane 001**. Click OK to start the merging process.



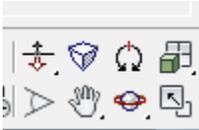
8. The model should now appear in your scene. Noticed the new layers in the Scene explorer. Unhide the Gizmo layer in the Scene explorer. We will use the Gizmo object to move the 3 wheeler. Now let's position the model at the center of the studio space. Click T to go to a top view and F3 to turn the view under wireframe.
9. Select the Gizmo object box. (the 3 wheeler has been link or parent to the gizmo object) Move and rotate the gizmo box to position the 3 wheeler. The 3 wheeler should be located and oriented where the podium is. One you are happy with the position, delete the podium object.



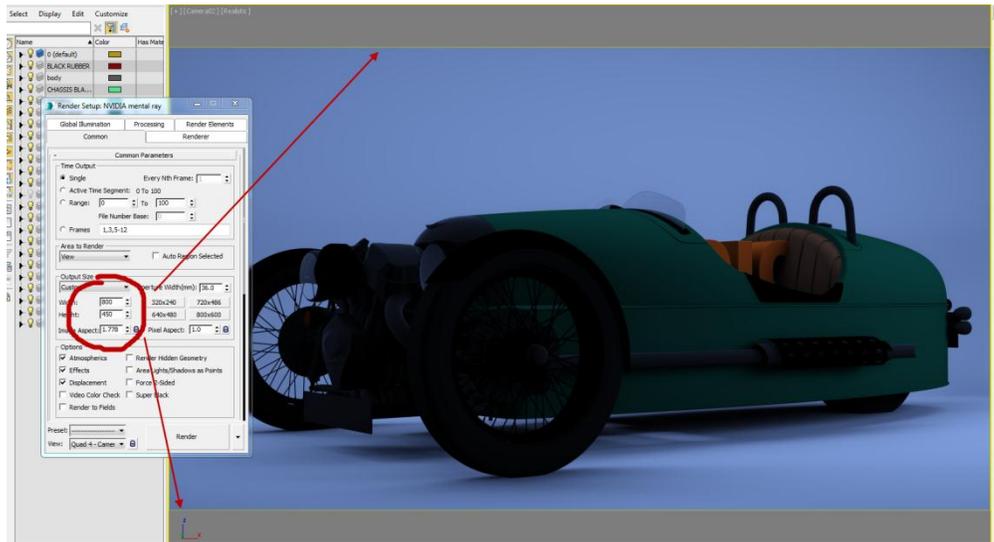
10. Press "F" to go to a Front View. Still with the Gizmo object selected, move the 3 wheeler on the Z axis so it sits right at the edge of the studio floor. Once you are done with the position, you can hide the Gizmo Layer.



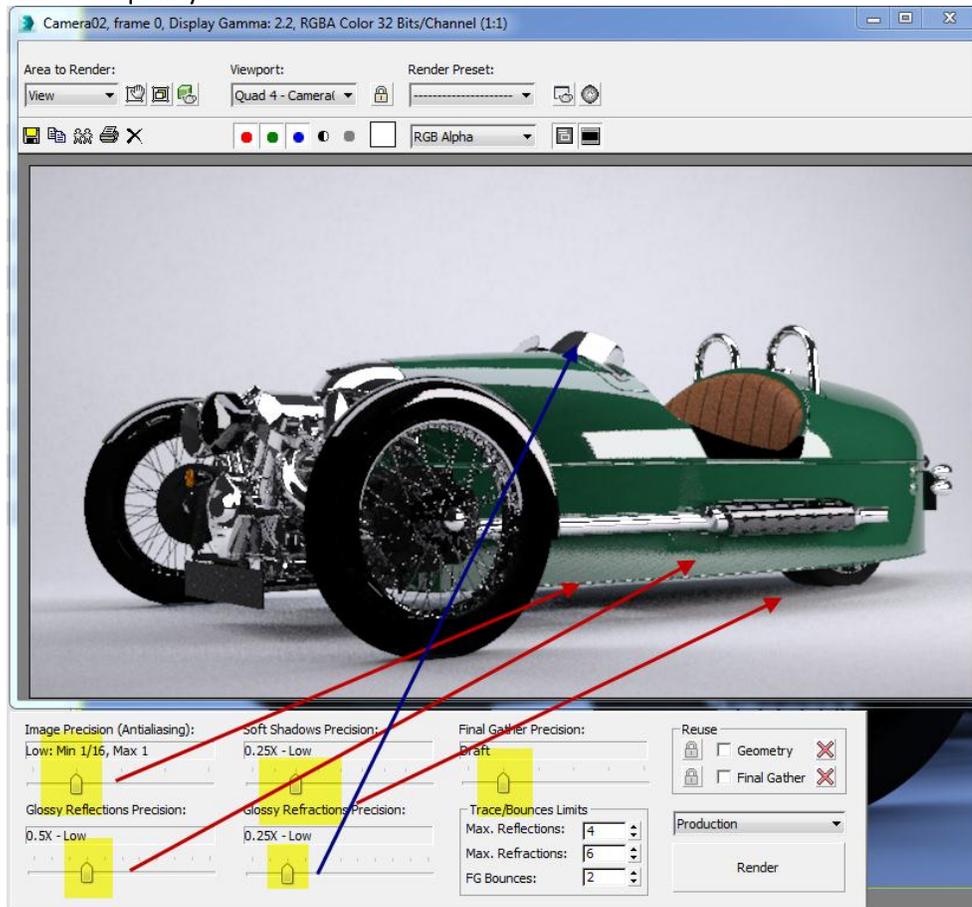
11. Press "C" to look at both camera views. Select camera 02 and adjust to your taste while using the Dolly, Roll, Truck and orbit camera tool at the bottom right of the viewport.



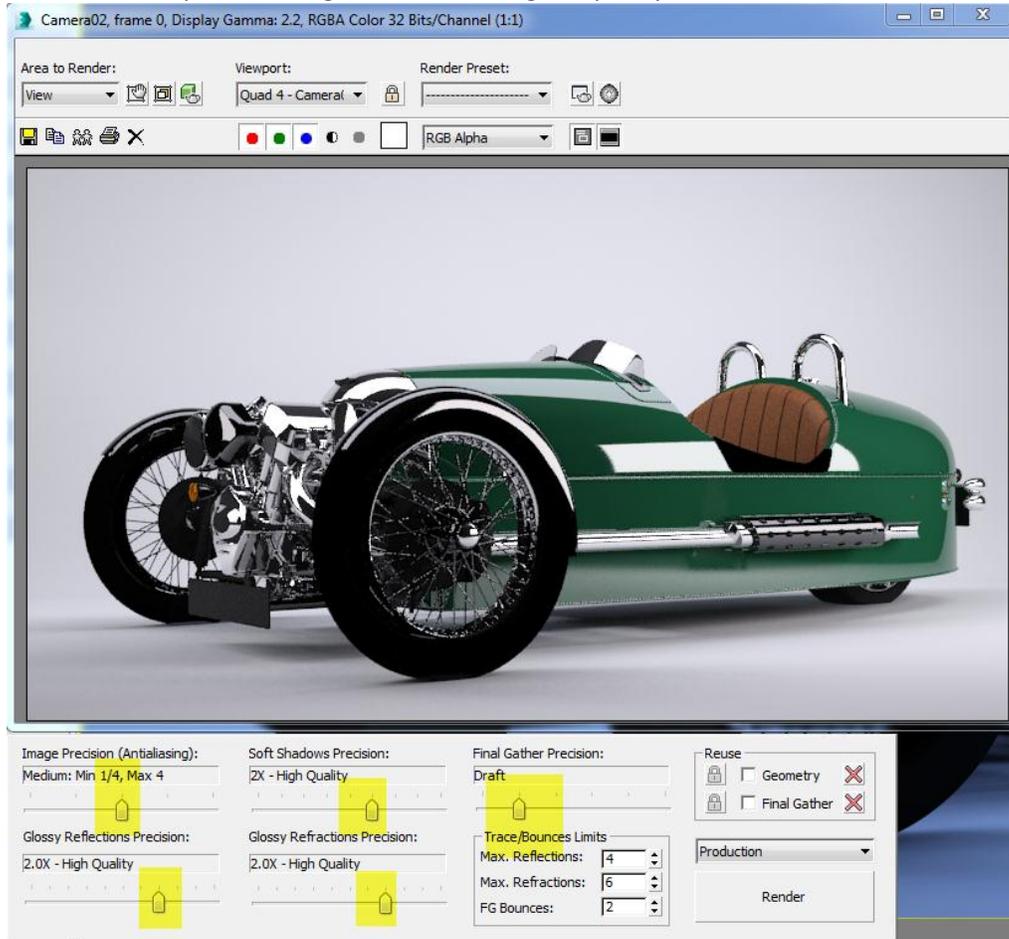
12. Open the render setup window . Adjust the rendering settings to be HD aspect ratio at 800 x 450 pixels. You might need to unlock the Image Aspect. You can see the adjustment of the rendering window from the safe frame window.



13. Open the rendering window and lower the rendering quality settings to minimize the rendering time and quality and click the render button.



14. Keep in mind that the lower quality setting will give you a quick render but a lower quality. Below is a comparison image render with higher quality.



15. This scene was saved as **Morgan3wheeler-3dsMaxDesign2015-StudioMentalRay-End.max**

Option #4: Studio light setup rendered with iray

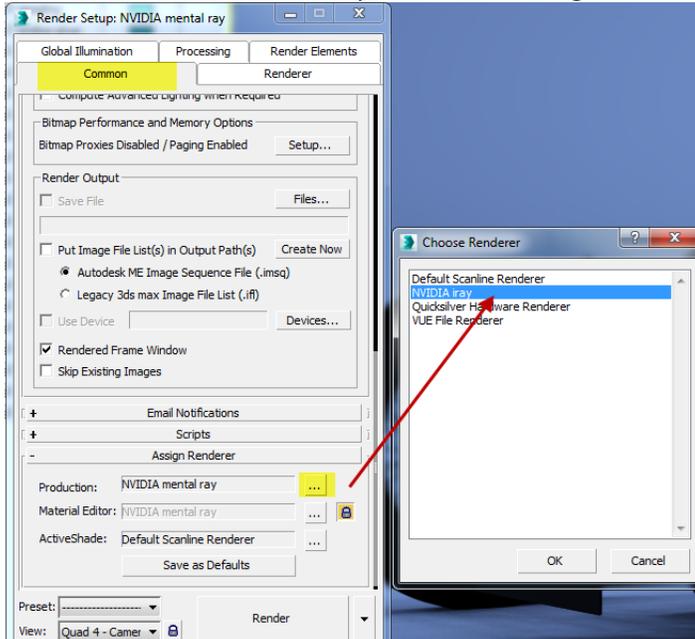
<http://youtu.be/4B1a7kisaQM>



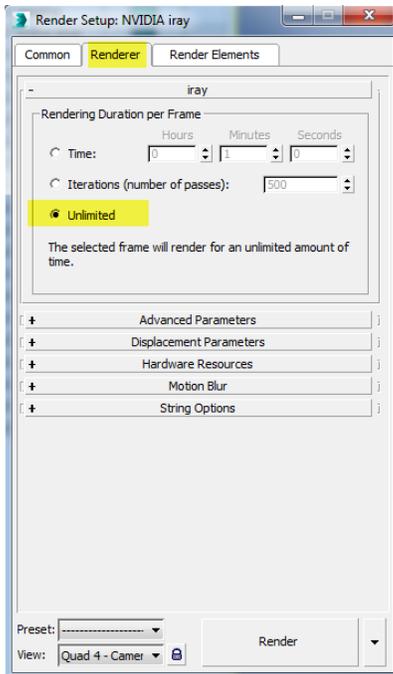
To start this exercise, you can continue on with the same scene or open the **Morgan3wheeler-3dsMaxDesign2015-StudioMentalRay-End.max** located in the project folder/Scenes.



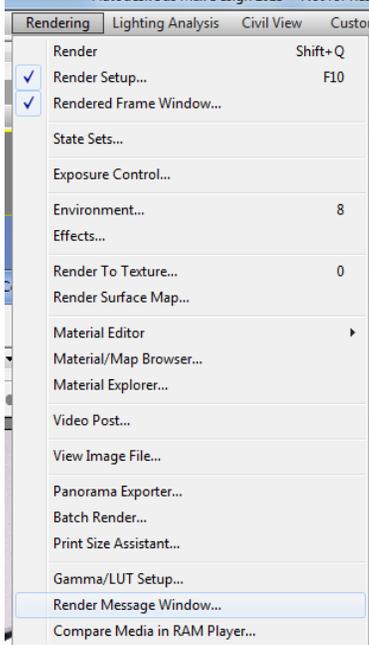
1. Open the render setup window.
2. In the render setup window, common tab, browse to the Assign Renderer section, click on the three dots next to the production section and choose NVIDIA iray from the list selection. This will switch the renderer to iray. Notice the change in the Render Setup window.



3. In the Render Setup window, go to the renderer tab and set the rendering duration per frame to unlimited and click render.



- As the image starts to render, notice the Render Message window pops up with errors being listed. Stop the rendering as we will fix these warning before rendering the final image. If the render message window did not open automatically, stop your render, go to the rendering menu>Render message window to open it and start your render again.



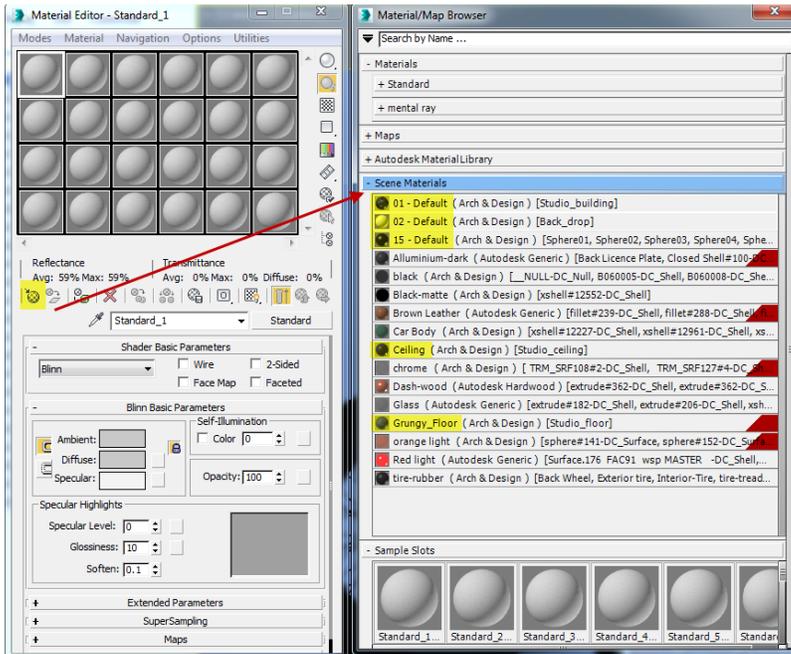
- The two errors relate to unsupported materials by the iray rendering engine. These must be applied on the studio set sample file. Let's find these materials.

```
IRAY 0.29 608 MB error: max_Composite using unsupported blend mode
IRAY 0.29 608 MB error: max_Composite using unsupported mask
```

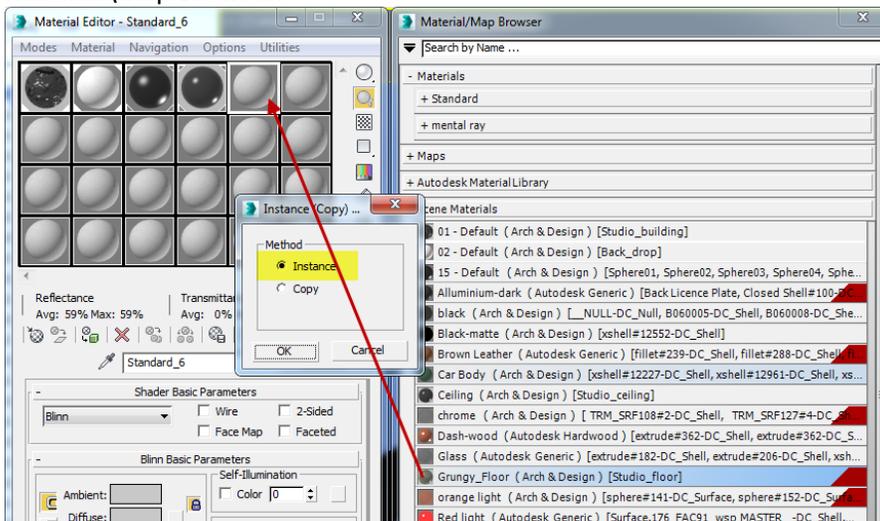
- Open the Material Editor.



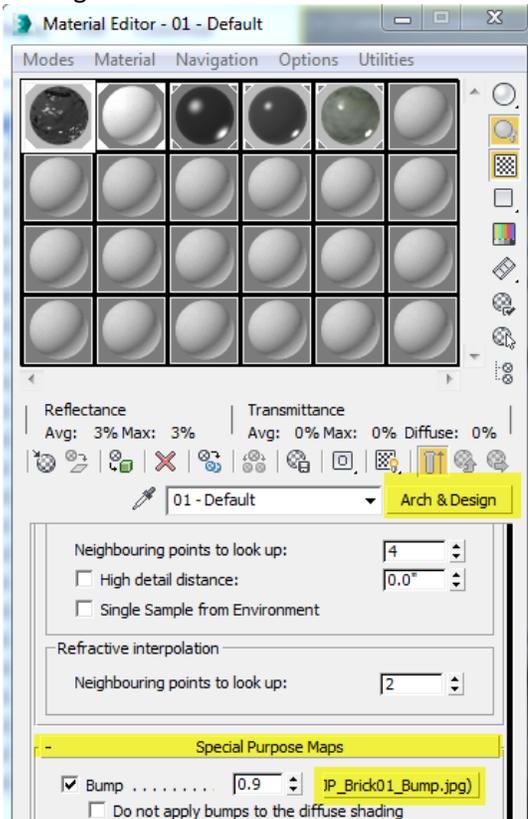
- From the material editor, click on the “get material” icon to open the Material/Map Browser. Scroll down (you might need to minimize other panels) to the Scene Materials.



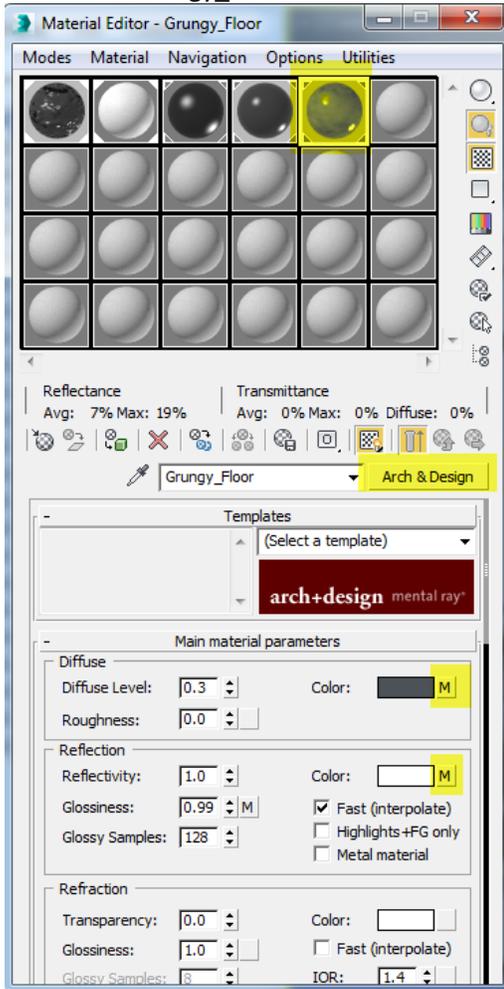
- Load the studio scene material 01 –Default, 02 Default, 15- Default, Ceiling and Grungy_Floor materials in the Material Editor. To do so, you can drag and drop each material an empty slot of Material Editor while selecting the “ Instance” option. Once you are done, close the Material\Map Browser.



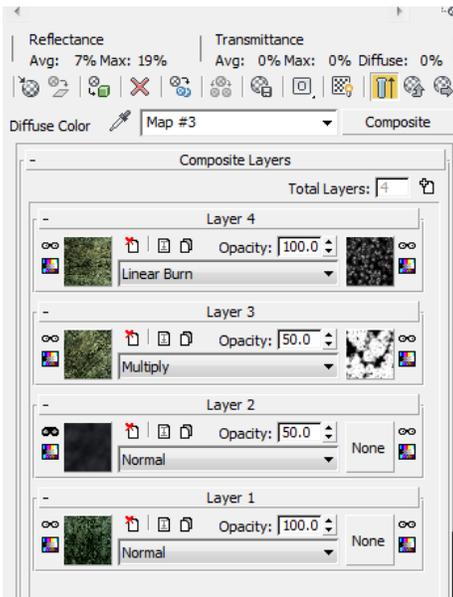
9. Select the 01 - Default Material in the Material Editor and look at the settings. This Material is an Arch & Design Material and therefore supported by Iray. While browsing to the Special Purpose Maps section, I can also see that the bump map is using a .jpg image which is also supported by Iray. This material is fine. Look at 02 – Default and 15 - Default and Ceiling materials, they should all be good.



10. Select the Grungy_Floor material. Notice the map applied to the diffuse colour.

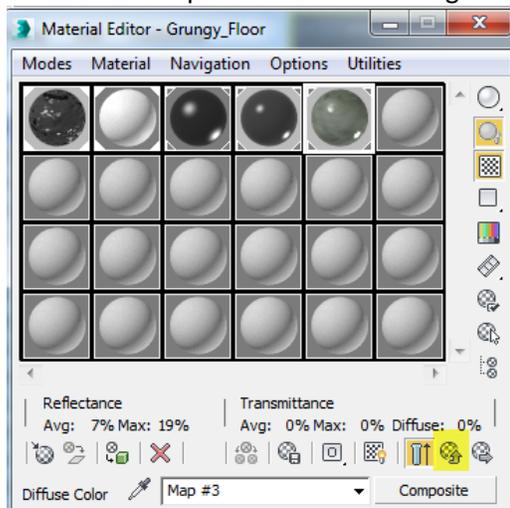


11. Click on the “M” button next to the colour swatch. A composite material is used as a diffuse colour.

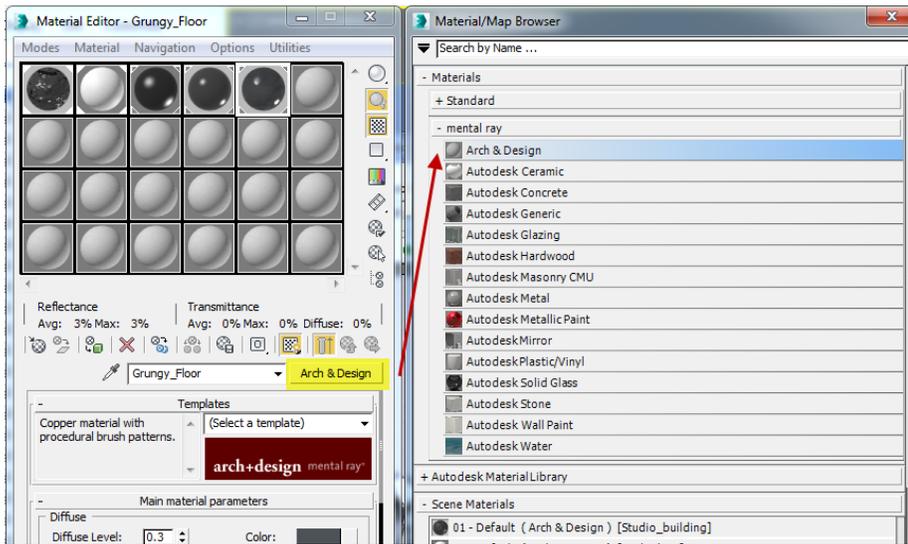


Composite maps are not supported by iray. To solve this error, you can decide to get rid of the composite material and re-create the material with supported element such as .jpg bitmap. For an easy fix, since this material looks like a concrete floor, we will replace it by an Arch&Design material using a concrete template material which is supported by iray.

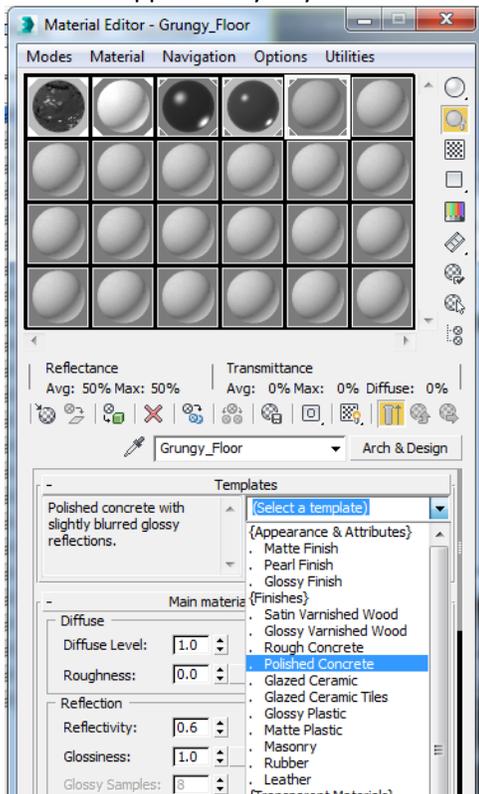
- Go back to the parent material settings.



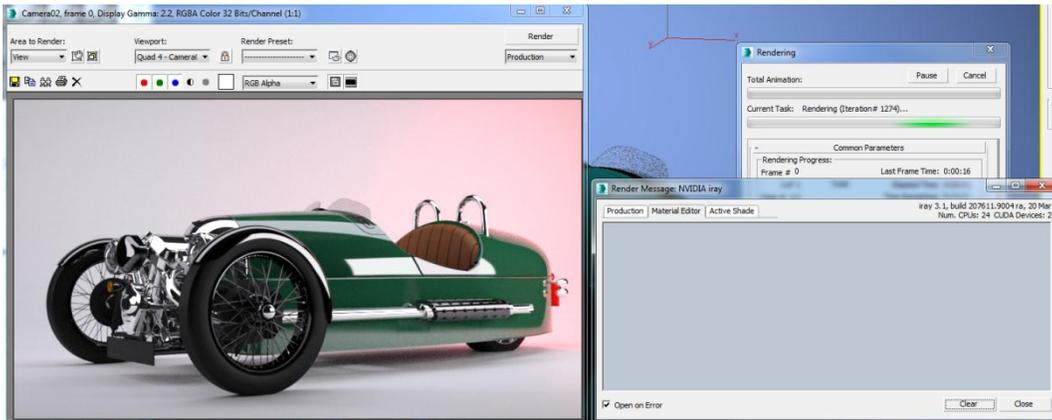
- To make sure that we reset the material completely, we will start from fresh. Click on the Arch & Design button to open the Material/Map Browser. From the Materials> mental ray list, choose the Arch & Design Material. This will load a fresh material with no previous settings.



- Click on the arrow next to the “select Template” window. Select the Polished Concrete template which is supported by iray.



- Open the Rendering message window (it should still be open, otherwise go to the Re-render the rendering menu>Render message window to open it) Click on the “clear” button to clear all previous error messages. Render the image. You should no longer have errors messages in the render message window.

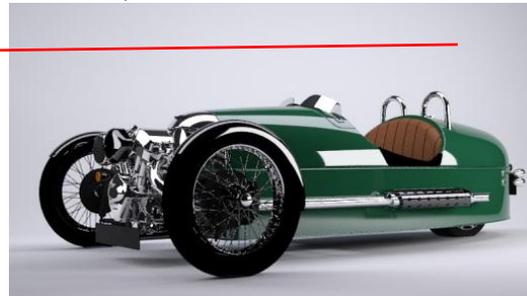


Now notice the pink light present in the background. When rendering with mental ray, we did not have that effect. This is created by the self-illuminated materials applied on the red back lights of the car. With other renderers, the self-illuminating surface simply appears to glow, while the light object does the actual light casting. But because the Iray renderer uses self-illumination as real illumination, a self-illuminating material generates lighting and the larger the self-illuminating area, the more noticeable the effect. The reason for this effect is that light-tracing renderers such as the Iray renderer don't distinguish between types of rays: Light rays, reflection rays, and shadow rays are all treated in the same way.

Iray

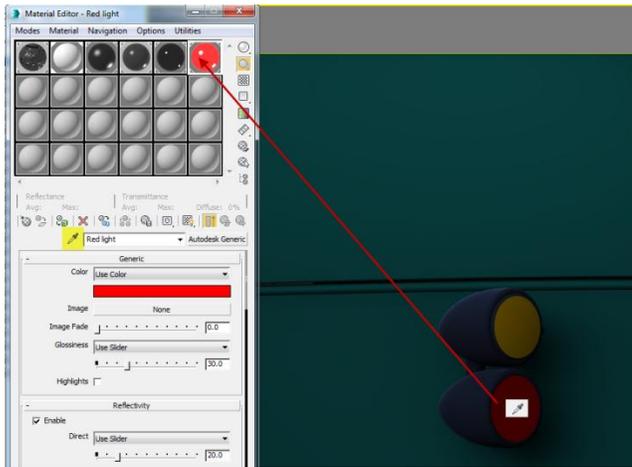


mental ray

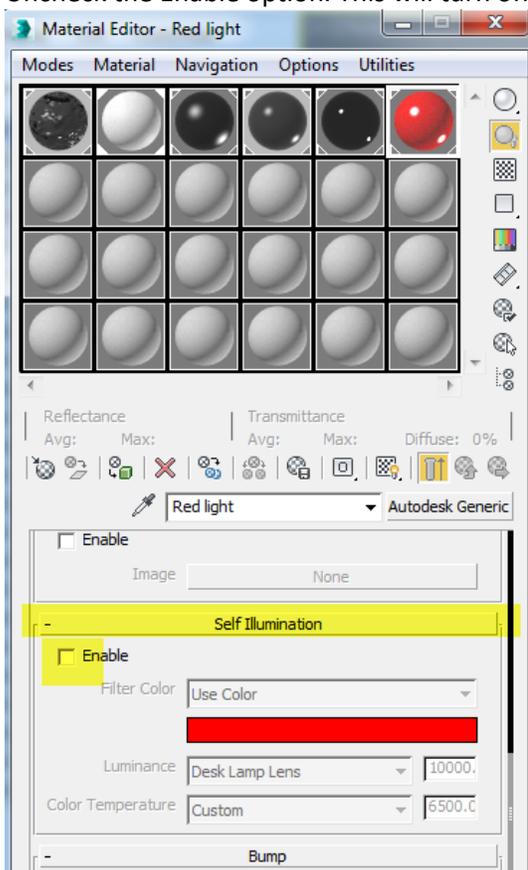


You might like this effect and want to leave it as is. If you don't you simply have to turn the self-illumination "off" from the materials.

- To turn the self-illumination off, let's first get the material from the light. Go into a perspective view by pressing the letter "P". Choose a perspective angle that lets you see the red back lights. Select an empty slot in the Material editor, click on the "pick material from object" button and click on the red light.



17. Look at the Red Light Material in the Material Editor and browse to the Self Illumination section. Uncheck the Enable option. This will turn off the self-illumination of the material.



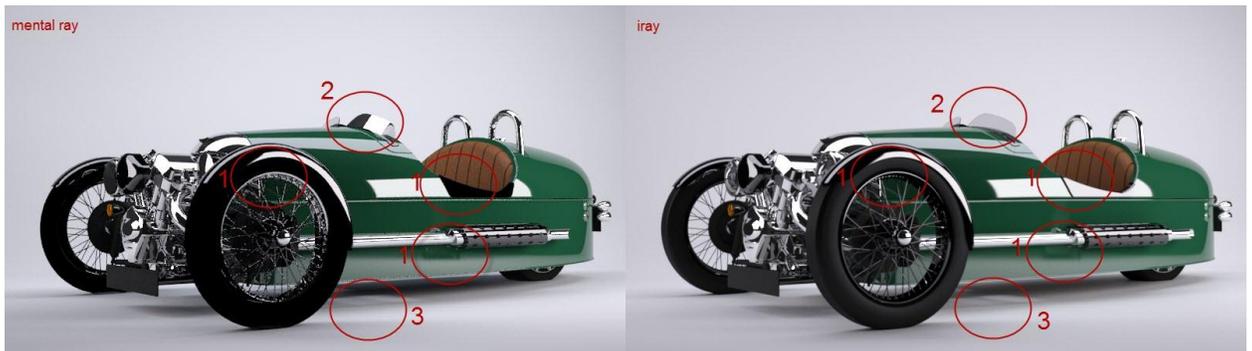
18. Press “C” to access the camera in the scene and select camera 02 from the scene. Re-render the image and let it render until you are satisfy with the quality.



This scene was saved as: **Morgan3wheeler-3dsMaxDesign2015-Studio-iray.max**

Here is a quick review of the differences in quality between iray and mental ray: you can find this image in the VI5396-LabDataset\renderoutput

1. The iray renderer is especially good at rendering reflections, including glossy reflections.
2. The iray renderer does not need setting adjustments to render accurate transparencies.
3. The iray render is really good at rendering soft shadows.
4. In general, the iray renderer supports only material, map or shader features that relate to physically based light-ray tracing



Option #5: HDRI image as background and lighting solution for mental ray

<http://youtu.be/1X-PSKcUzXQ>



When creating visuals in Inventor or Autodesk Showcase, you have access to a selection of environment such as Country Road, Desert Dawn Road, Dry Salt Bed and so on. These presets environment are HDRI dome and will drive the lighting and reflection quality of the image. Unfortunately, we do not have the same presets in 3ds Max® Design available with one click of a button. However, with few clicks and very little knowledge of 3ds Max® Design you will be able to recreate this type of lighting using any HDRI image that you have, including the HDRI used within Showcase. For this exercise I am showing a really simple way to use an HDRI image to drive the lighting of the scene. It is important to know that you can position your model in a more accurate way using Perspective match toolset in 3ds Max® Design.



Showcase Environment examples

You can find a wealth of HDRI images online. Make sure that you respect the artist rights by purchasing the proper license or by using royalty free images.

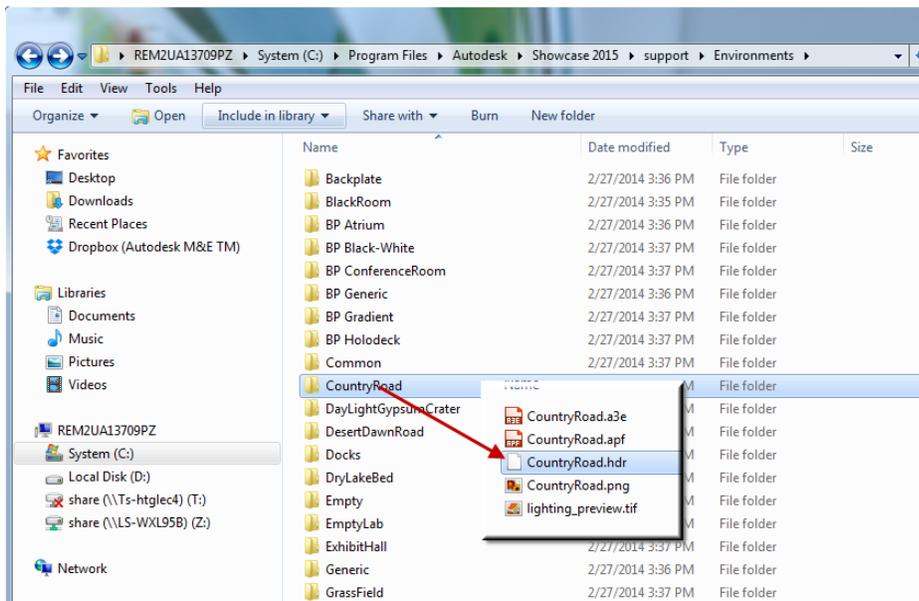
<http://cgibackgrounds.com/>

<http://www.openfootage.net/>

<http://www.hdri-hub.com/>

When installing Showcase (as part of the Autodesk Suite), you gain access to the HDRI images used by the software. You can find these HDRI image in the following folder:

C:\Program Files\Autodesk\Showcase 2015\support\Environments

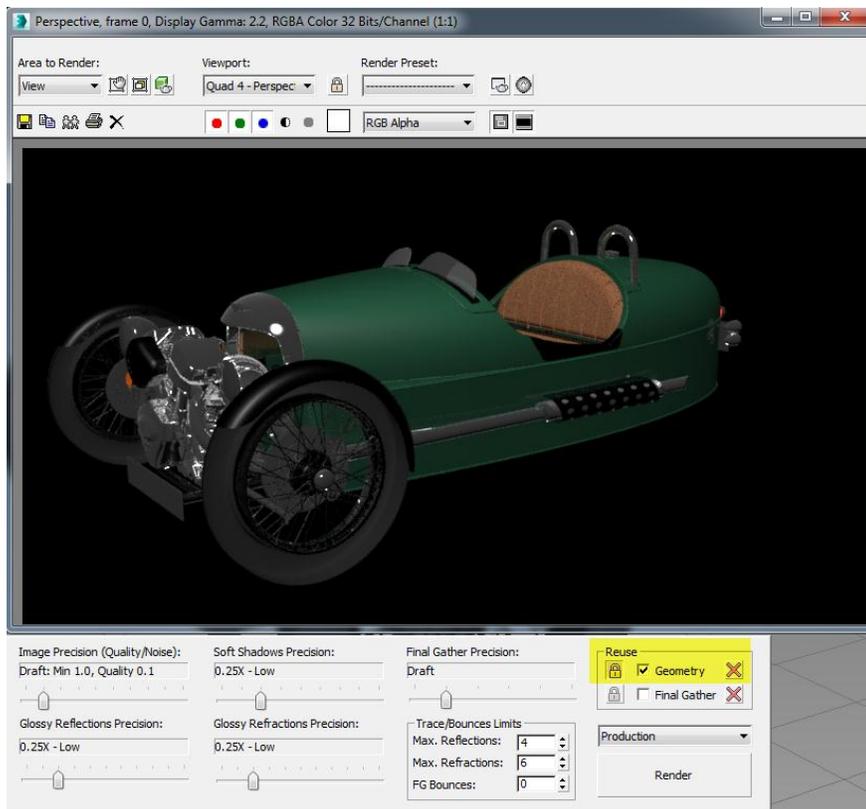


1. To start this lighting option we will open the original scene which represent the state right after the import and clean-up of the model: **Morgan3wheeler-3dsMaxDesign2015-START.max**
2. Render a quick image to make sure you have no lighting settings in that scene. The render should look like this:



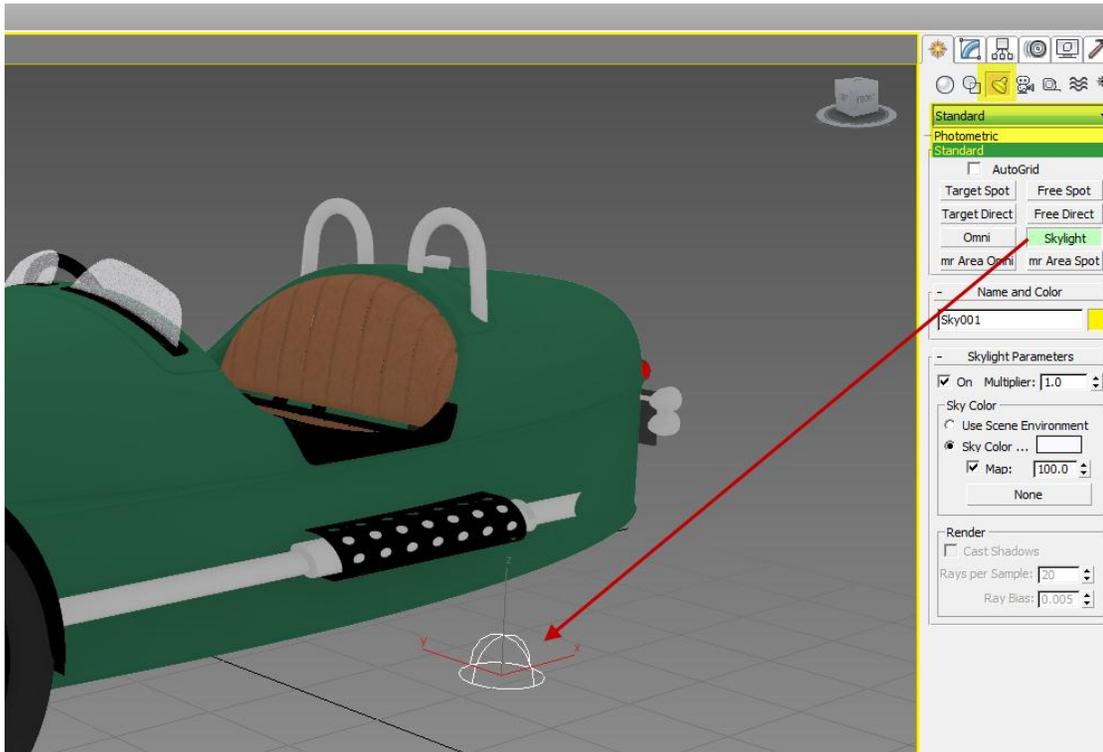
3. To accelerate the rendering process, we will check the option Reuse Geometry and lock it in the rendering window.

When turning this option on, rendering uses geometry caching. During the first render, the translated geometry is saved to the cache file. Then, in subsequent renderings of the same scene, the renderer uses the cached geometry for any unchanged objects instead of retranslating it. Any changed geometry is retranslated. Default=off.

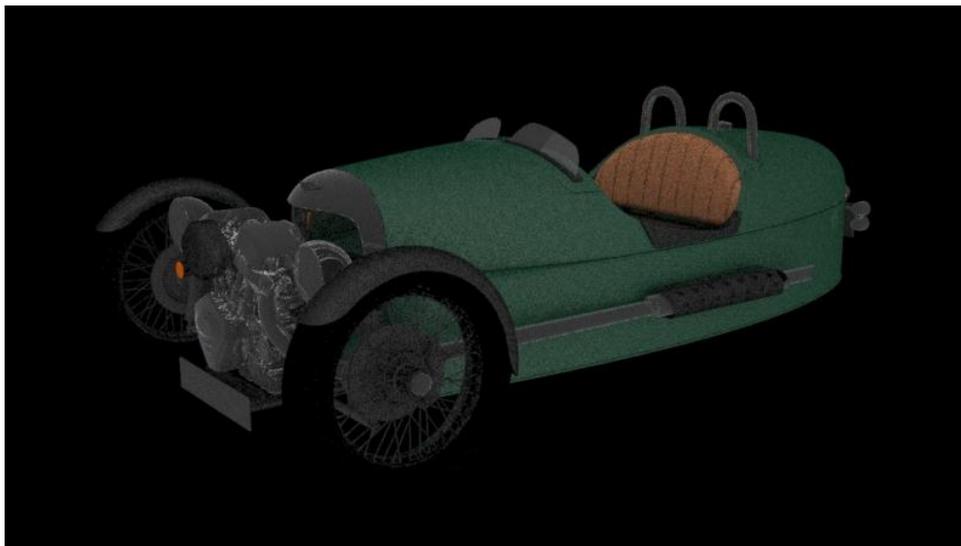


4. Drop a regular Skylight to the scene: Go to the control Panel lights tab; choose the Standard type lights from the drop down menu. Click on the Skylight button on create a skylight in your scene.

*The position of the skylight in your scene is irrelevant.

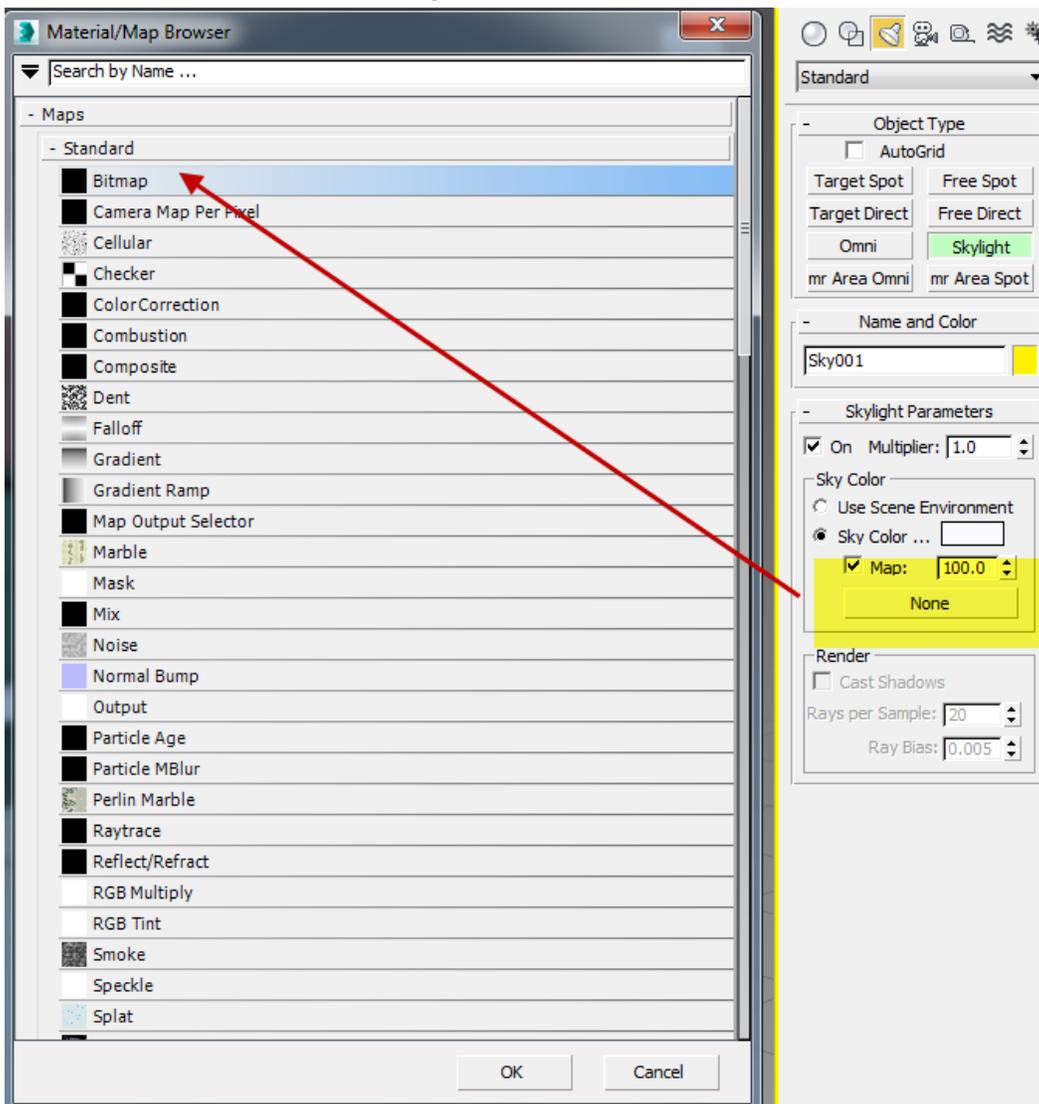


5. If you re-render the image, it should look like this: Not that impressive so far.. but you can tell that some ambient light are coming in the scene.

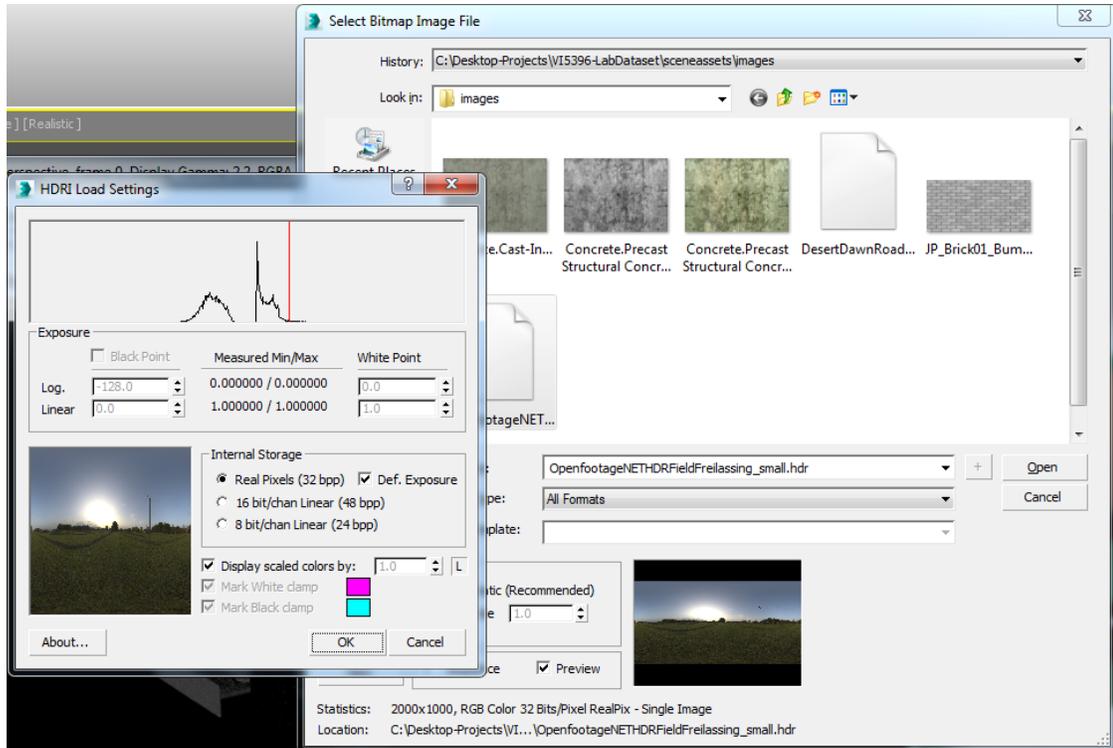


Next I will load an HDRI images to drive the lighting from the skylight. Here you can use any HDRI image that you like. Please be cautious of the size of the HDRI image as they tend to be fairly high resolution. For this particular example, I have downloaded a small size royalty free HDRI from Open Footage titled: OpenfootageNETHDRFieldFreilassing_small.hdr
<http://www.openfootage.net/>

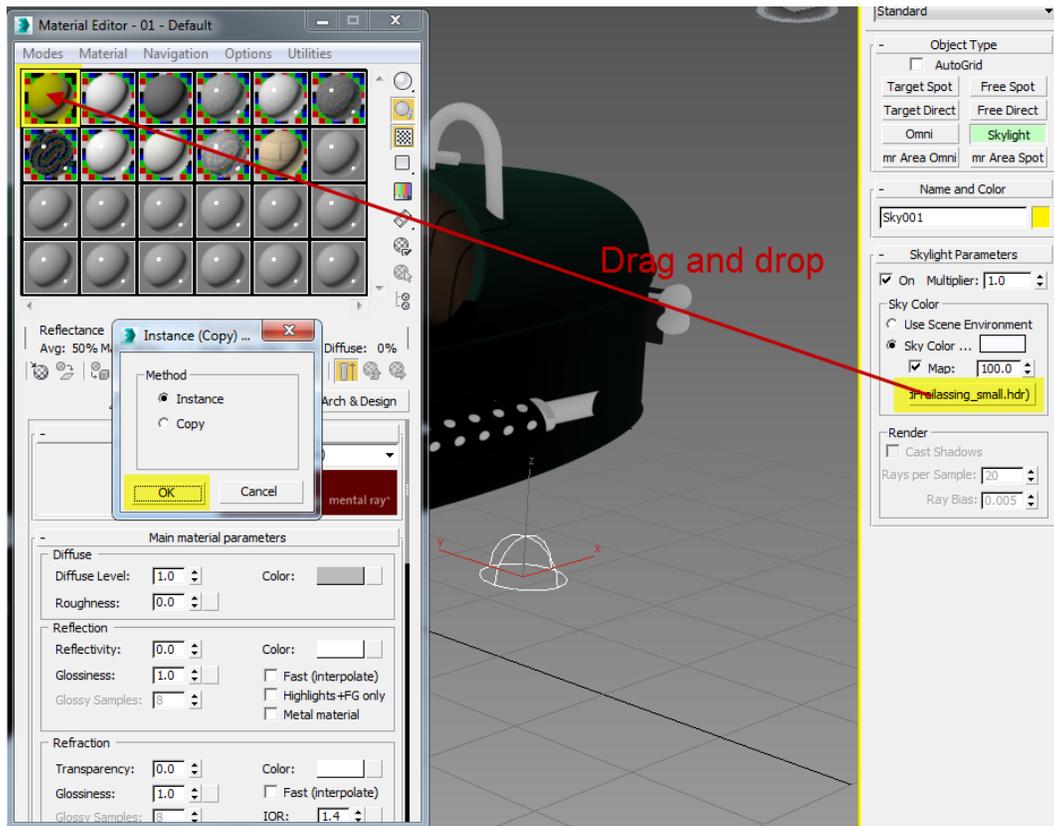
6. With the skylight selected, go to the control panel, Skylight Parameters and click on the “None” button. Browse to the Maps section and select a Bitmap file and click ok. You are now creating a material that will host the HDRI image.



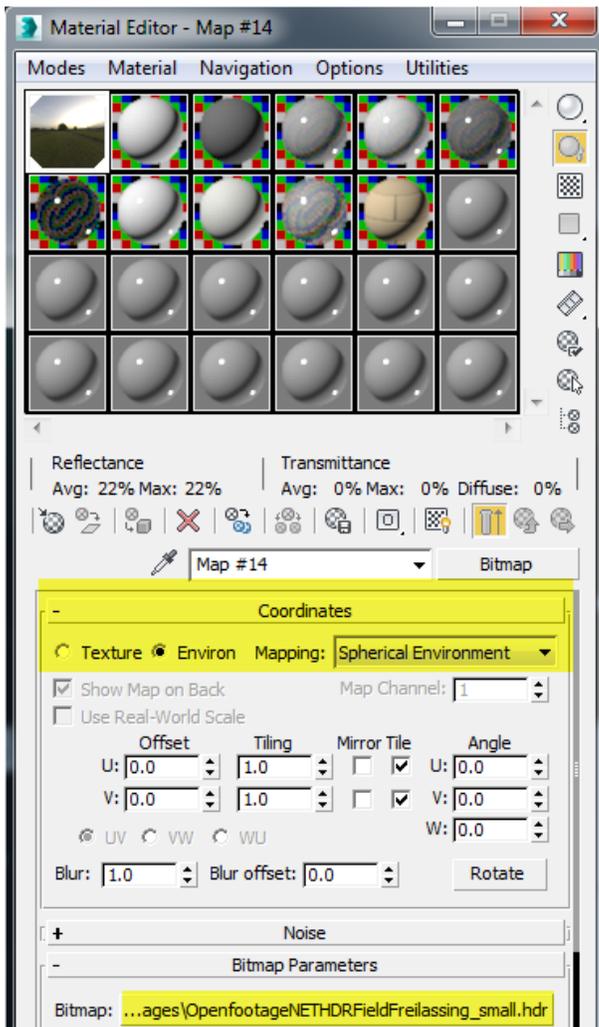
- Navigate to the project folder\sceneassets\images and select the OpenfootageNETHDRFieldFreilassing_small.hdr. Click ok to the HDRI load Settings window.



- To view and adjust the HDRI material properties, you need to drag and drop the Skylight material you have just created into the Material Editor and choose the Instance option.



9. From the Material Editor, change the material coordinate to Environ and Mapping to be: Spherical environment.

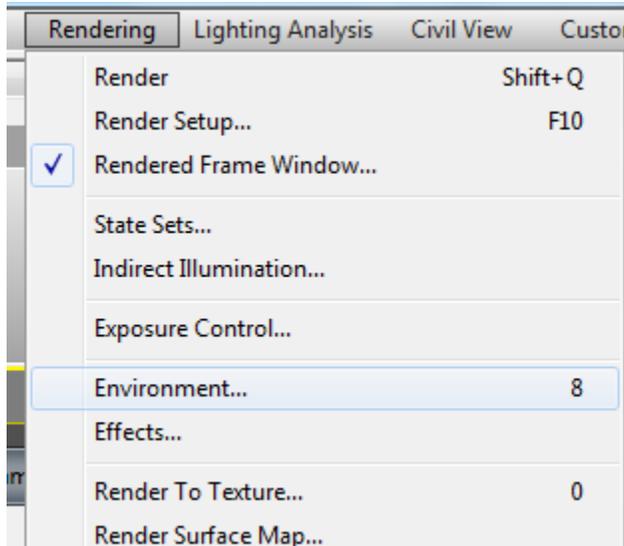


10. If you render again, it should look like this:

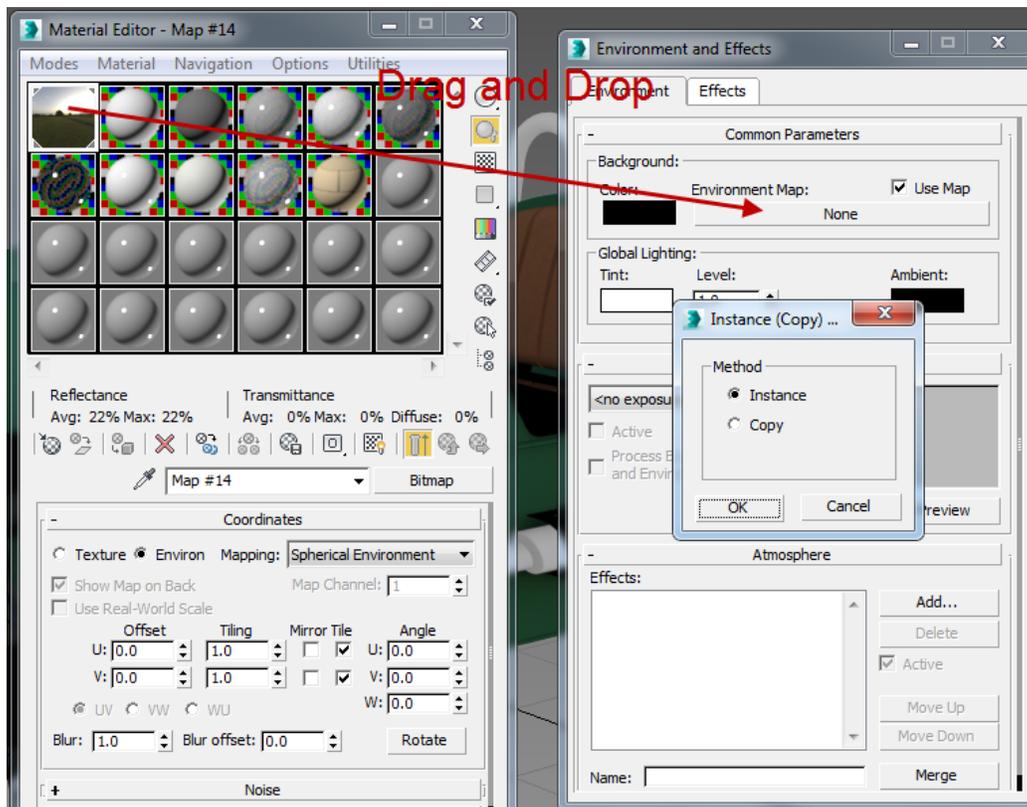


We now start to see nice reflection but because the model is sitting in a pitch black environment, the effect is not that great yet.

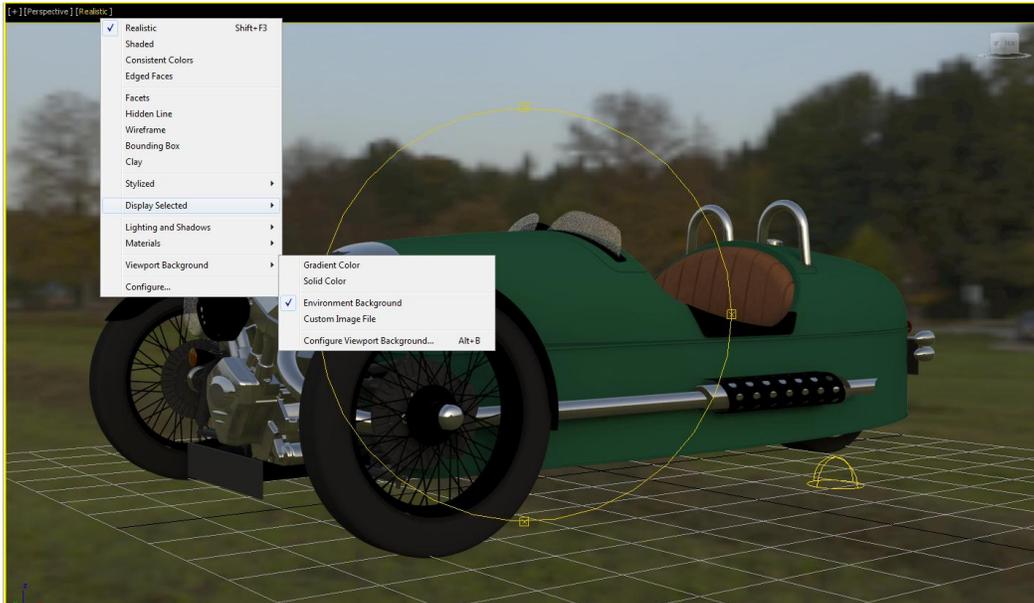
11. To change the scene environment, go to the main menu Rendering>Environment.



12. From the Material Editor, drag and drop the HDRI Material on the Environment and Effect window Environment Map button make sure you select the "instance" option.



13. To view the environment image in the viewport, go to the viewport menu “Realistic” and choose the Viewport Background> Environment Background option.

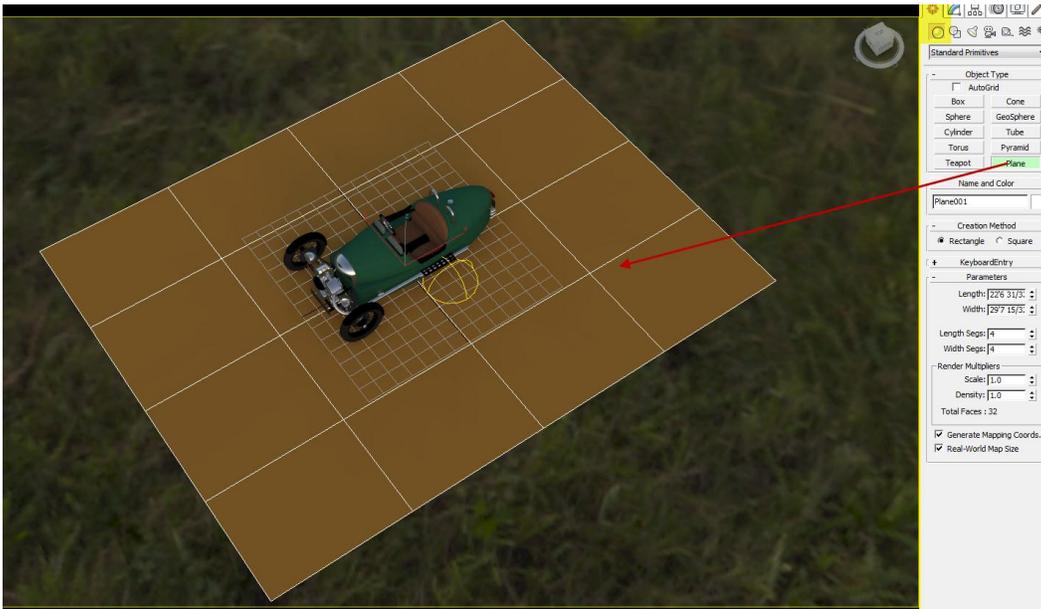


14. Render again. You should get something like this:

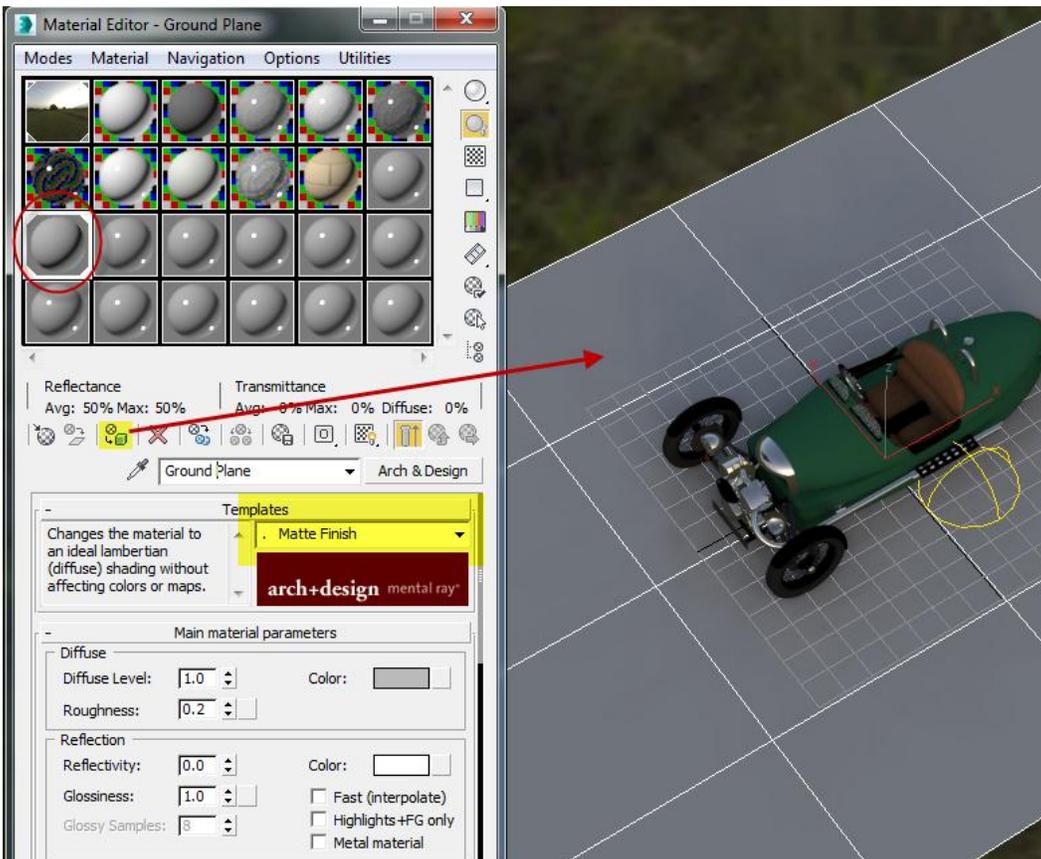


The image is starting to look better but the model doesn't feel like it belongs to the image yet as it is not casting any shadow on the background image.

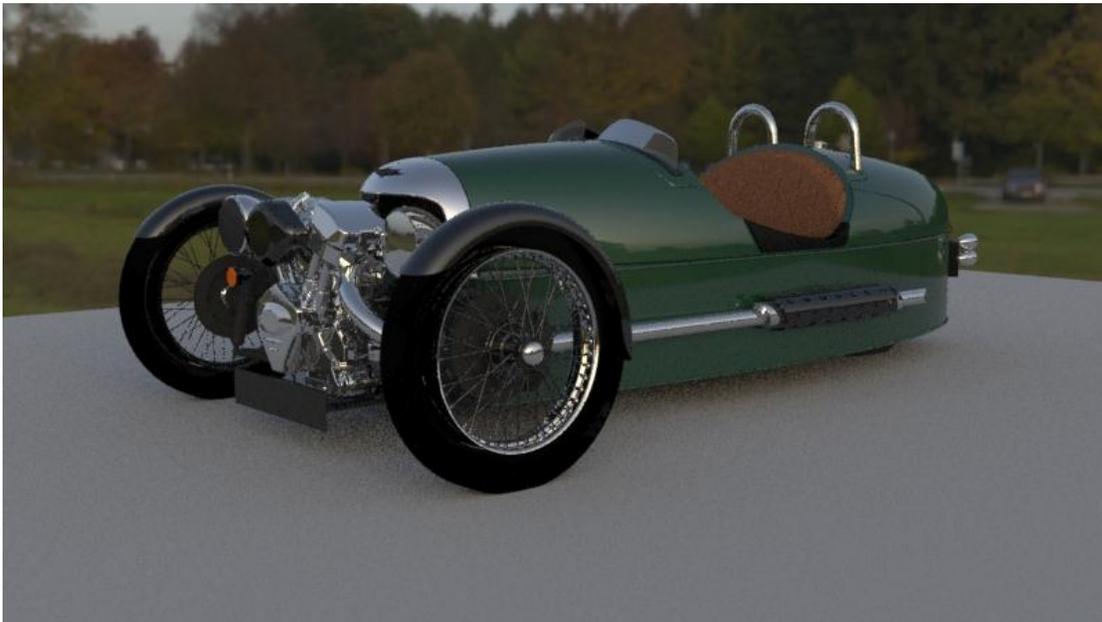
15. Create an object plane in the scene that will receive the shadow of the 3 wheeler model. Go to the control panel, Geometry and create a plane right under the 3 wheeler model.



16. Open the Material Editor, create an Arch&Design Material with a Matte Finish template and apply it to the plane object.

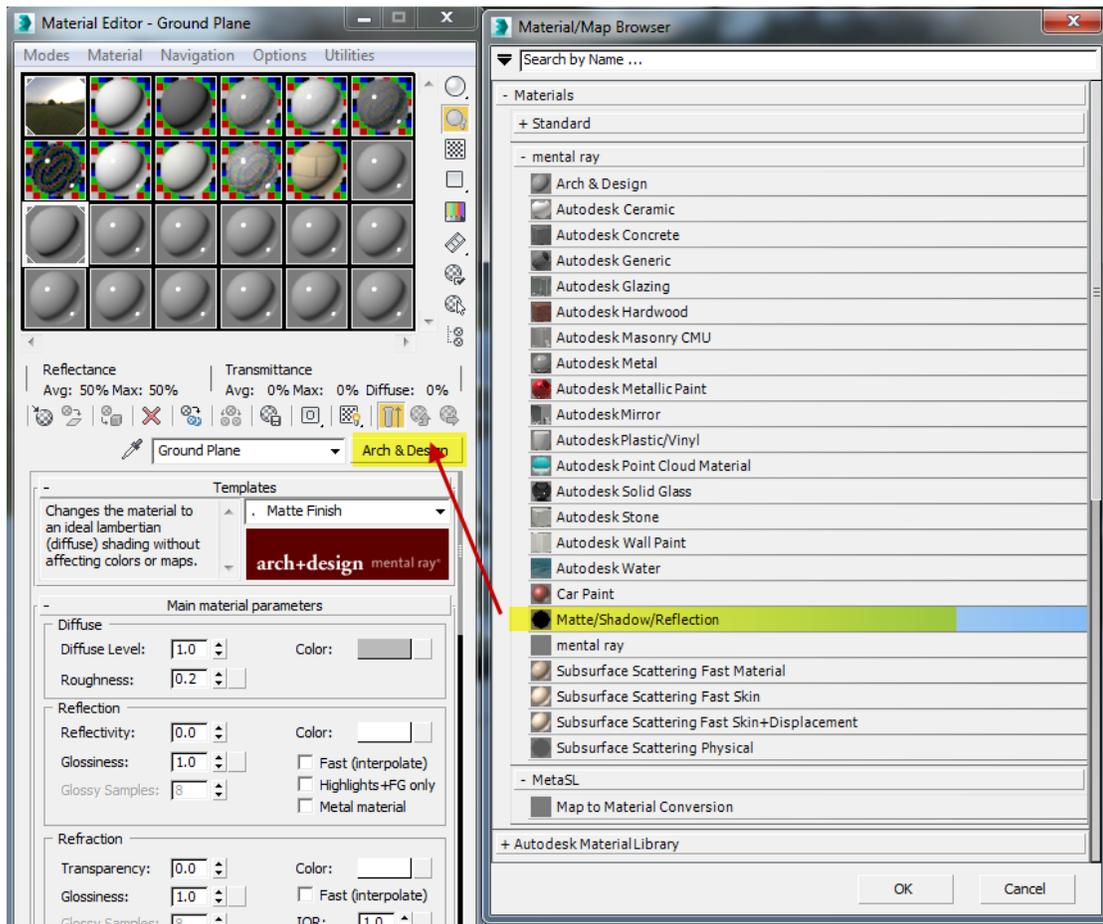


17. Re-render and you should get something like this:



Now that we have a plane object under the 3 wheeler, the shadow is being cast. This might be ok for what you are looking for, but what if you don't want to see the plane but still want the shadows?

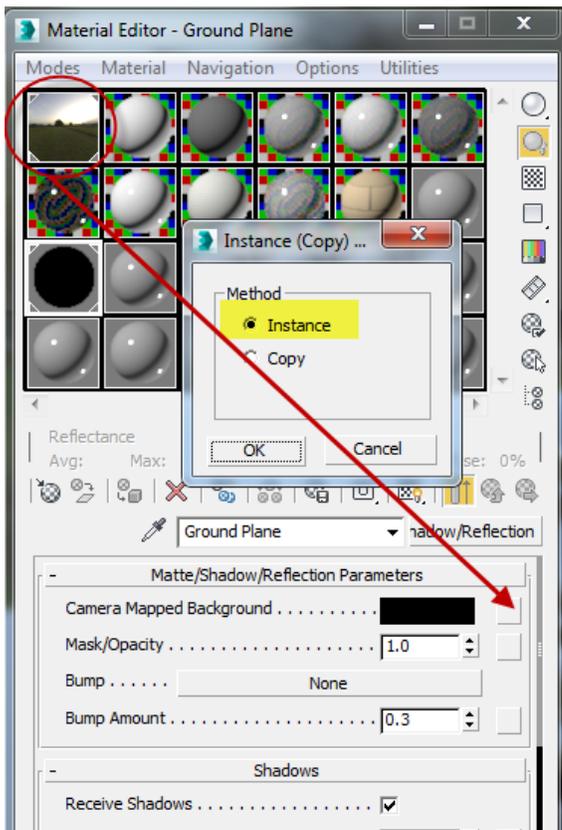
18. We will make the Plane object transparent to the view but allow it to received shadow by using a Matte/Shadow/Reflection material for mental ray (not supported by iray). Select the material you have created for the plane object. Click on the Arch&Design button to open the Material/Map Browser. Browse to the Material> Mental Ray section and load the Matte/Shadow/Reflection material.



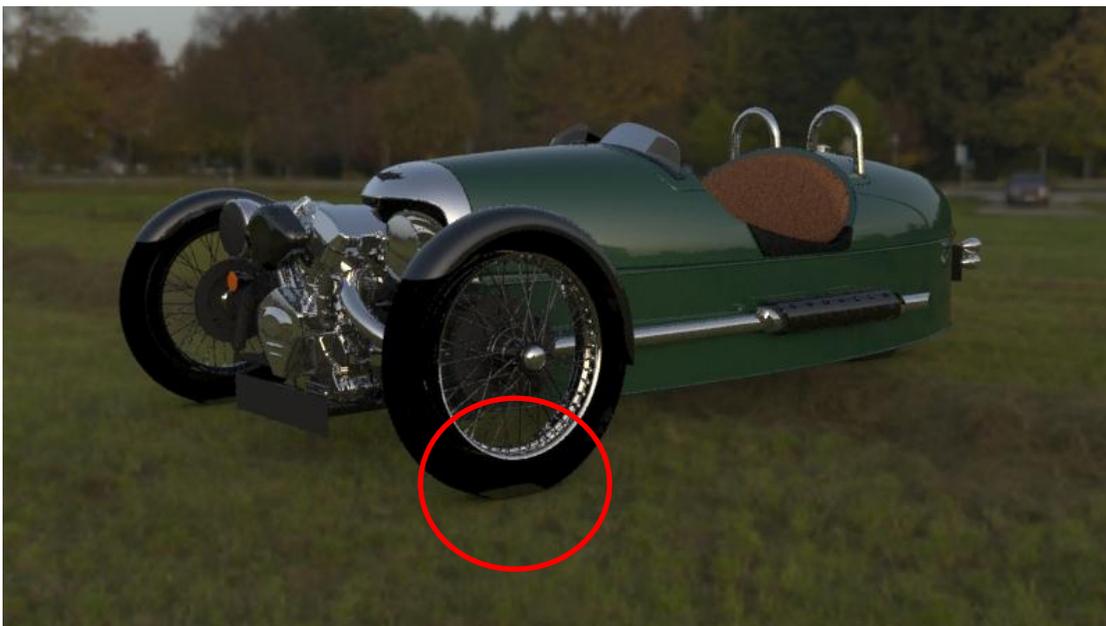
You can find more information on this material here:

<http://help.autodesk.com/view/3DSMAX/2015/ENU/?guid=GUID-3F934E37-CC74-4EC7-A0E2-A96A0880CF84>

19. With the Matte/Shadow/Reflection materials selected go to the parameters Camera Mapped Background. Drag and drop the Environment material in the button next to the black colour and choose the option “instance”.



20. Re-render the image. You should get something like this:



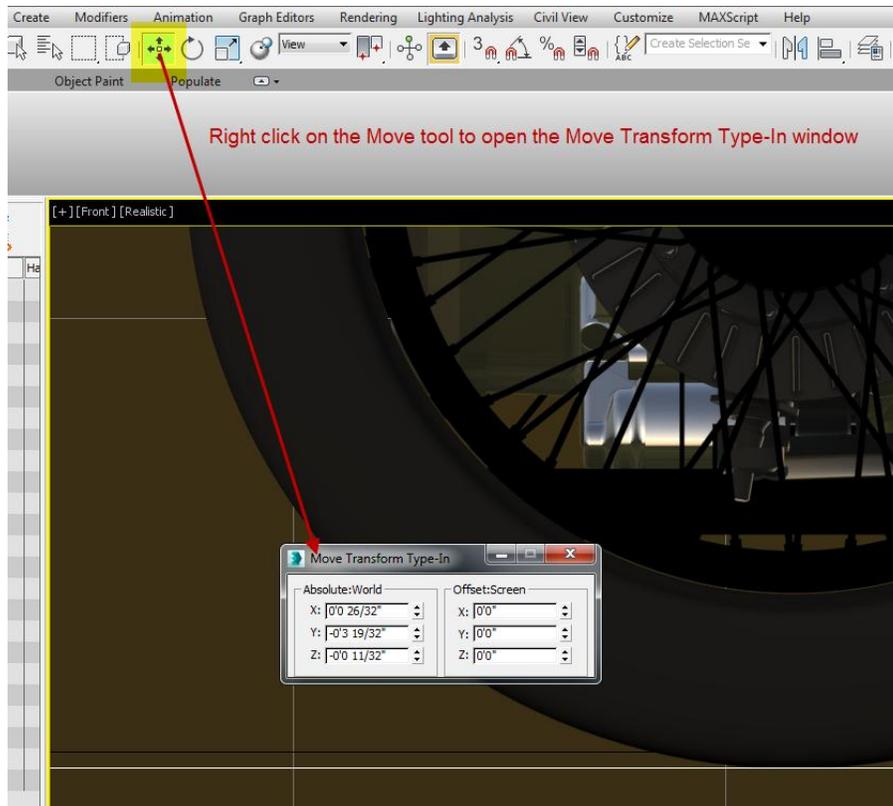
The 3 wheeler now has a shadow underneath. However, notice the weird grey shape under the front wheels. This is created by the ground plane not sitting directly underneath the wheels but

cutting through. When we created the Ground plane, the plane was created at 0 on the Z axis by default. Now it's looking like the front wheels are slightly below the 0 axis.

21. Select the ground plane and move to a front view by pressing F. Zoom in really close to the front wheel. Notice that the ground plane is not sitting under the front wheel but cutting through.



Move the ground plane exactly below the front wheels. For more precision, you can open the Move Transform Type-In window by right clicking on the Move tool.



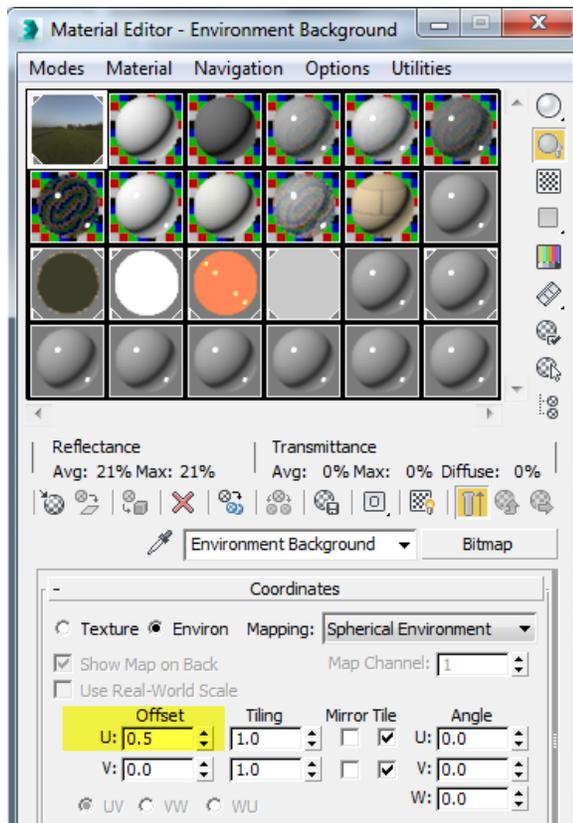
22. Go back to a perspective view and re-render. You should get something like this:



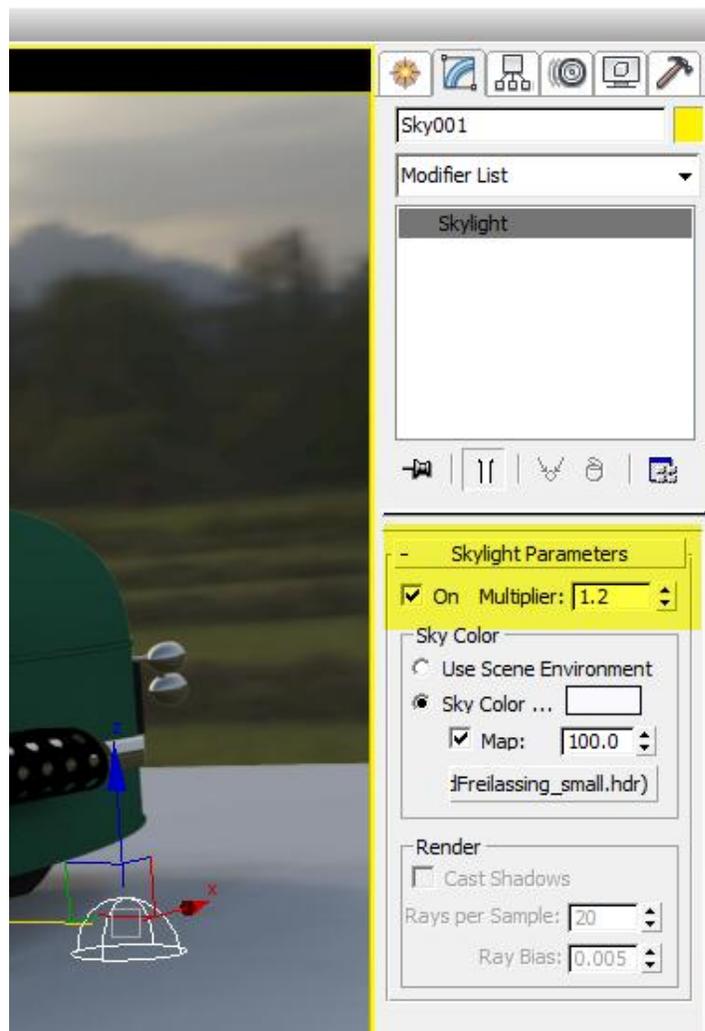
This scene was saved as: **Morgan3wheeler-3dsMaxDesign2015-HDRI-mentalray.max**

23. From here, you can enhance the artistic look of your image by doing a list of things such as:

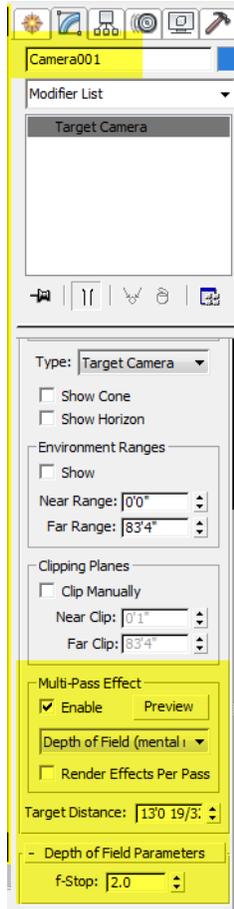
- Rotate the environment background



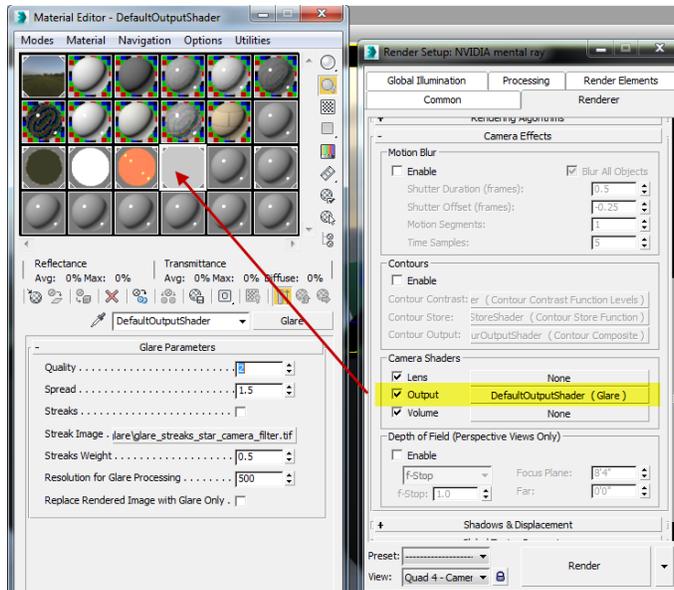
- Adjust the skylight intensity



- Create a camera with roll angle
- Add Depth of Field



- Add camera lens Glare effect



- Enhance or change the materials, add textures, the list goes on at infinitum....

Re-render till you are satisfied and be creative and mostly have fun!



View the recording of the artistic progress of this scene: http://youtu.be/lz2_nFuZOaA



This scene was saved as: **Morgan3wheeler-3dsMaxDesign2015-HDRI-mentalray-Artistic.max**

For more tips and tricks with 3ds Max® Design, visit my YouTube Channel.

<https://www.youtube.com/user/LandryMarion>

If you have a technical question you can post them on the 3ds Max Forum, Design Visualization Workflows is the forum I personally monitor. http://forums.autodesk.com/t5/Design-Visualization-Workflows/bd-p/design_visualization_workflows

Feel free to suggest tips and tricks you would like to see by contacting me via the multiple social media platform. Have fun!