

# Binding Bones To Tank Tracks Guide

(In this document, our operations will be performed on 3ds Max2015 software)

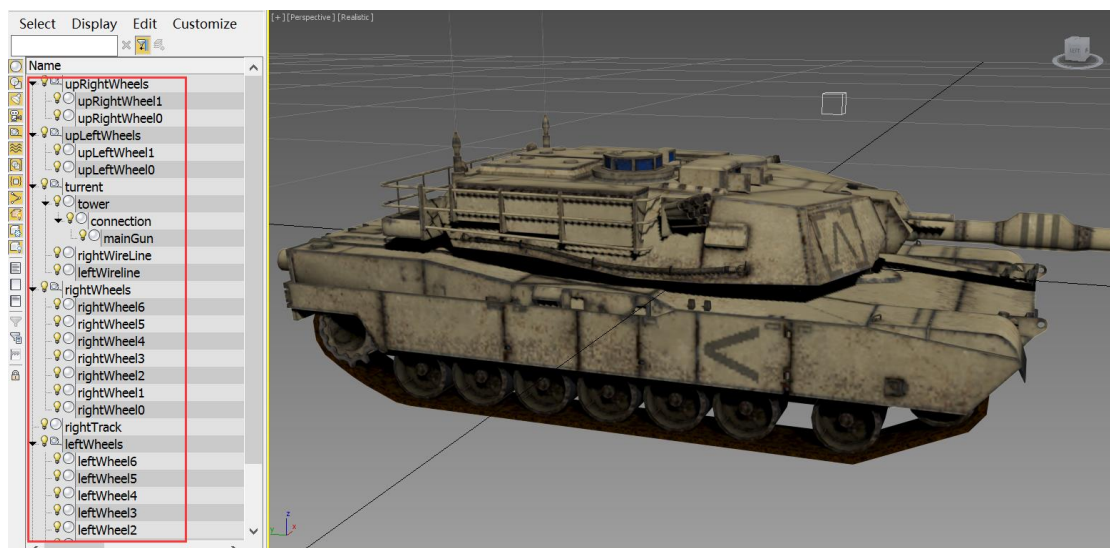
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# 1. Preparations

First of all, we need to do the following preparations before binding bones for tank tracks

(1). Ensure that all the wheels and tracks has been properly separated from the tank model, that is to say, each wheel is a separated submodel, and each of the tracks of the tank is also a separated submodel.



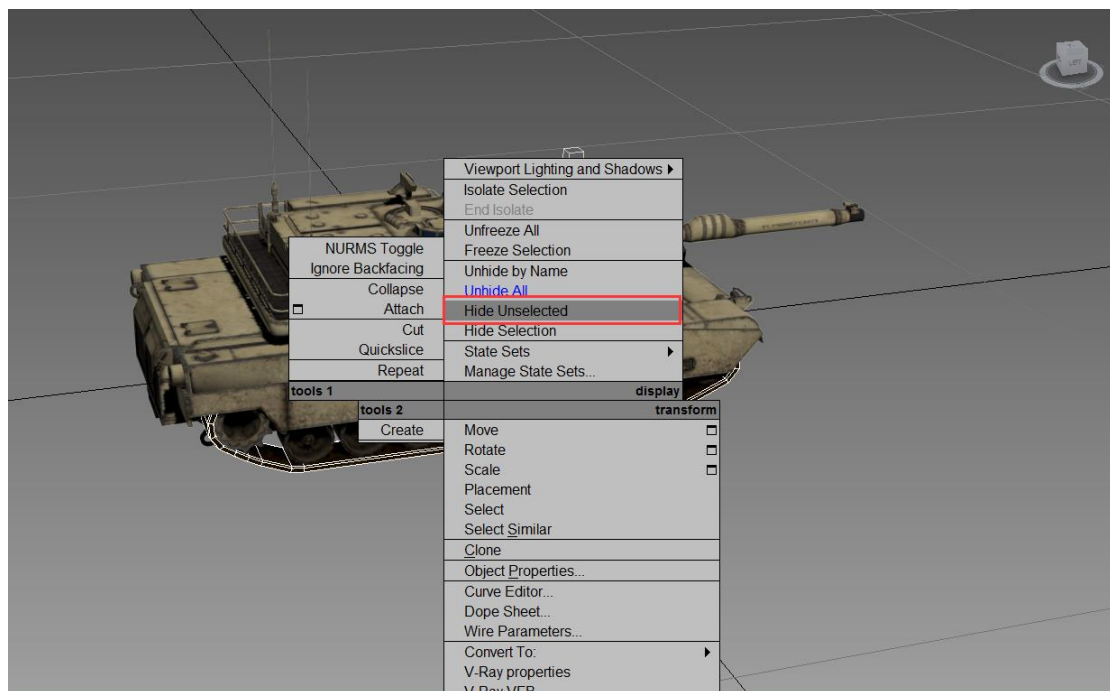
(2). Adjusting coordinate axis's the position and direction for the tank's submodels. The coordinate axis of the wheel must be at the center of it.



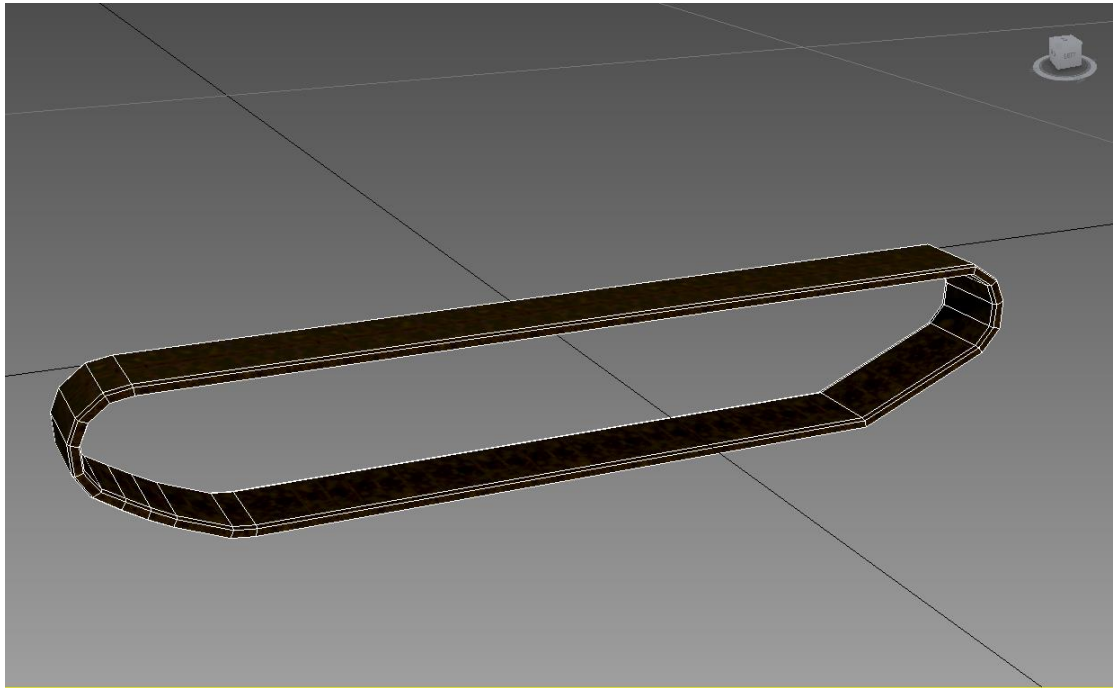
## 2. Track Mesh Subdivision

Before binding bones to the track, we must ensure there are enough lines on the track's mesh. Only in this way, the performance of track's deformation will be good enough when the bones generate displacement. Now, we take the bottom part of the track as an example to explain how to subdivide track's mesh

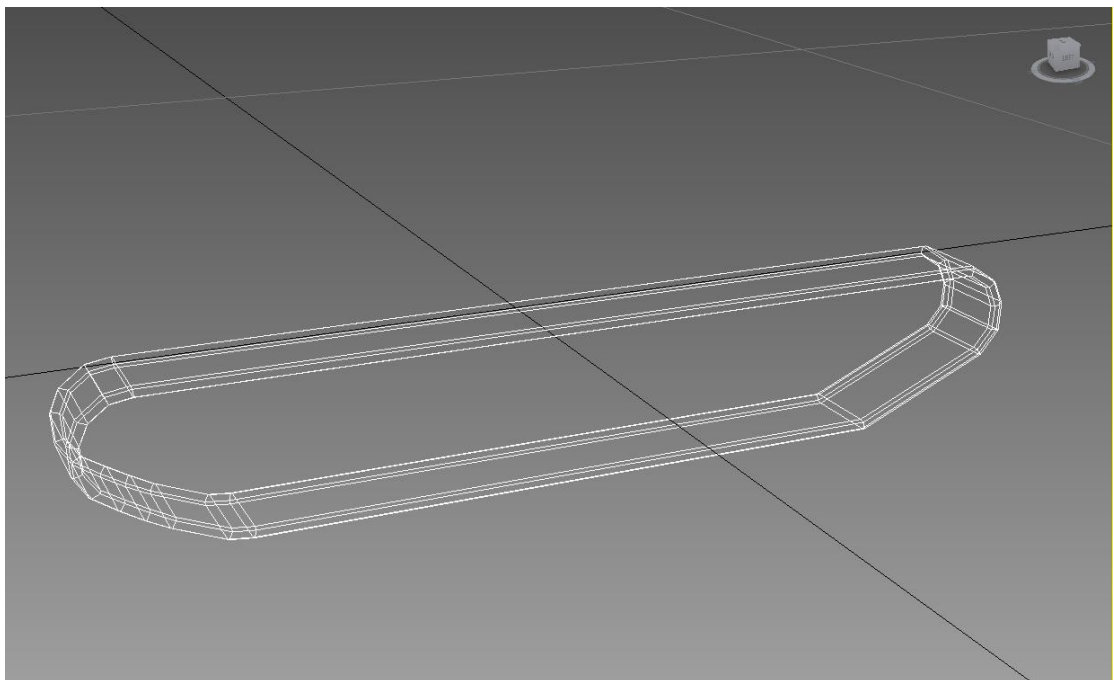
(1) Selected the track located in the right side of the tank, right click the blank place of the view, selected the option named *Hide Unselected*.



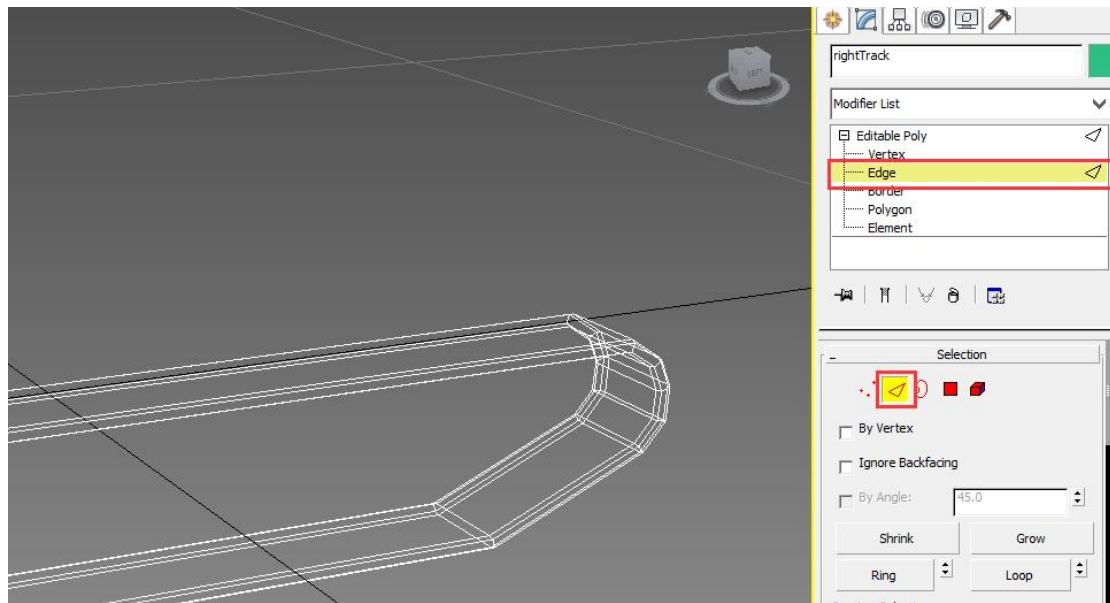
Now, except the track located in the right side of tank, the rest of the models has been hidden.



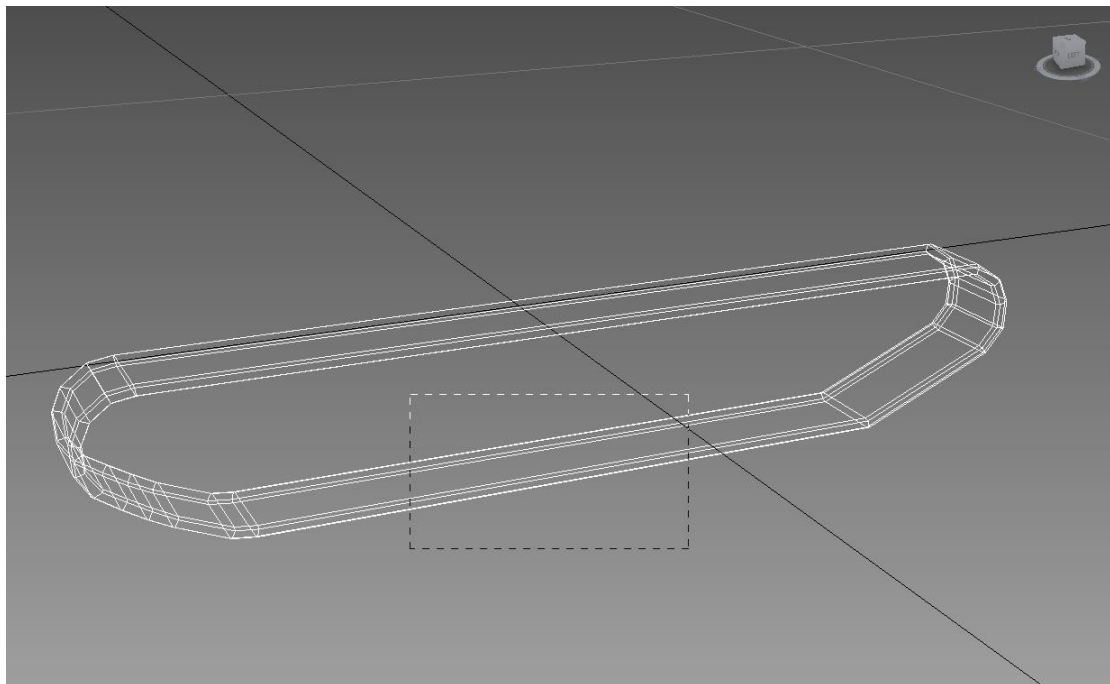
Press the F3 hot key to make our display of the view switch to the wireframe pattern.



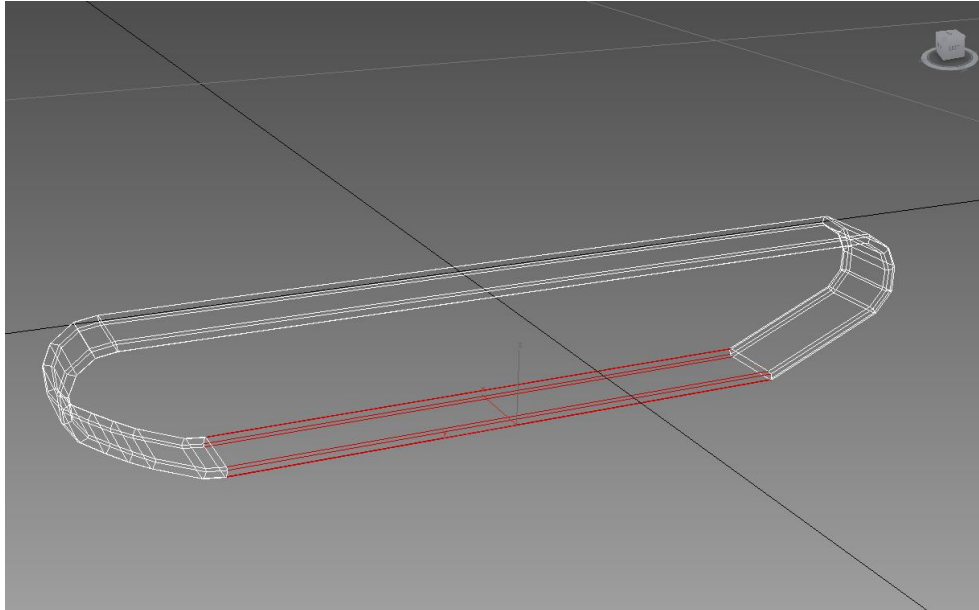
Selected the edge option in the modifier: *Editable Poly*->Edge.



Selected the bottom lines of the track.

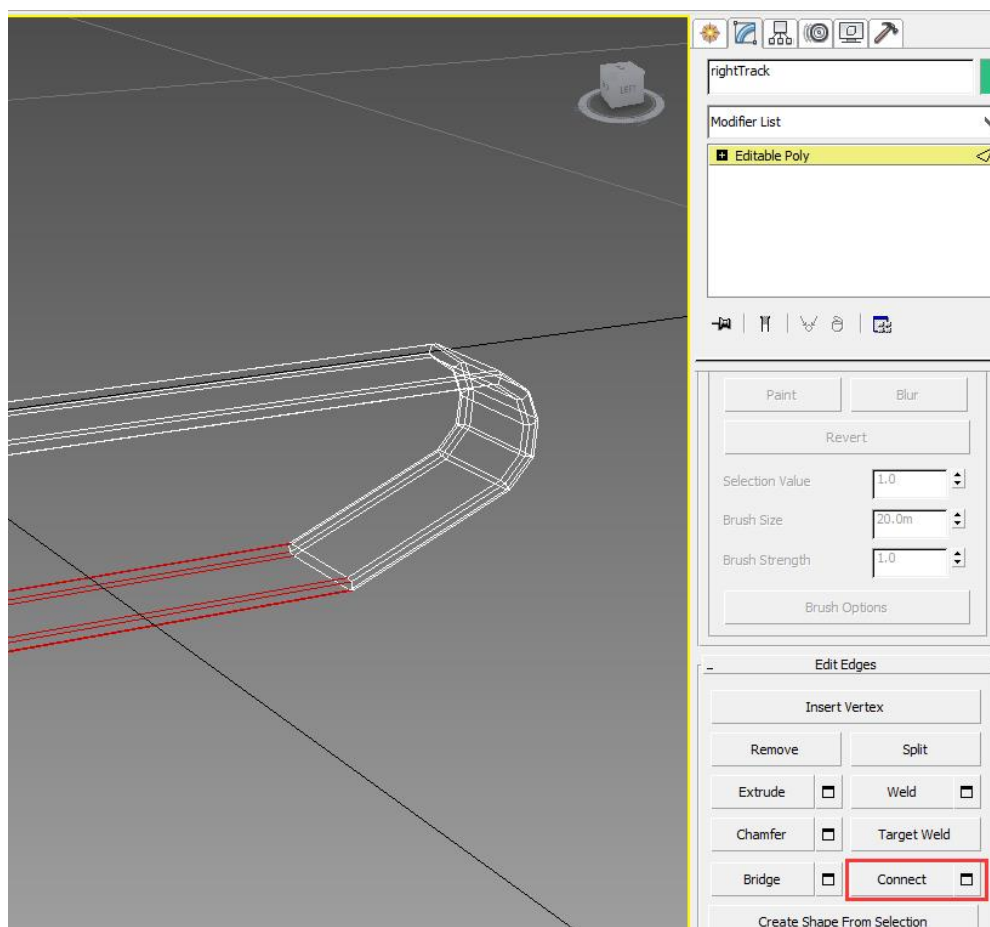


The bottom lines of the track has been selected

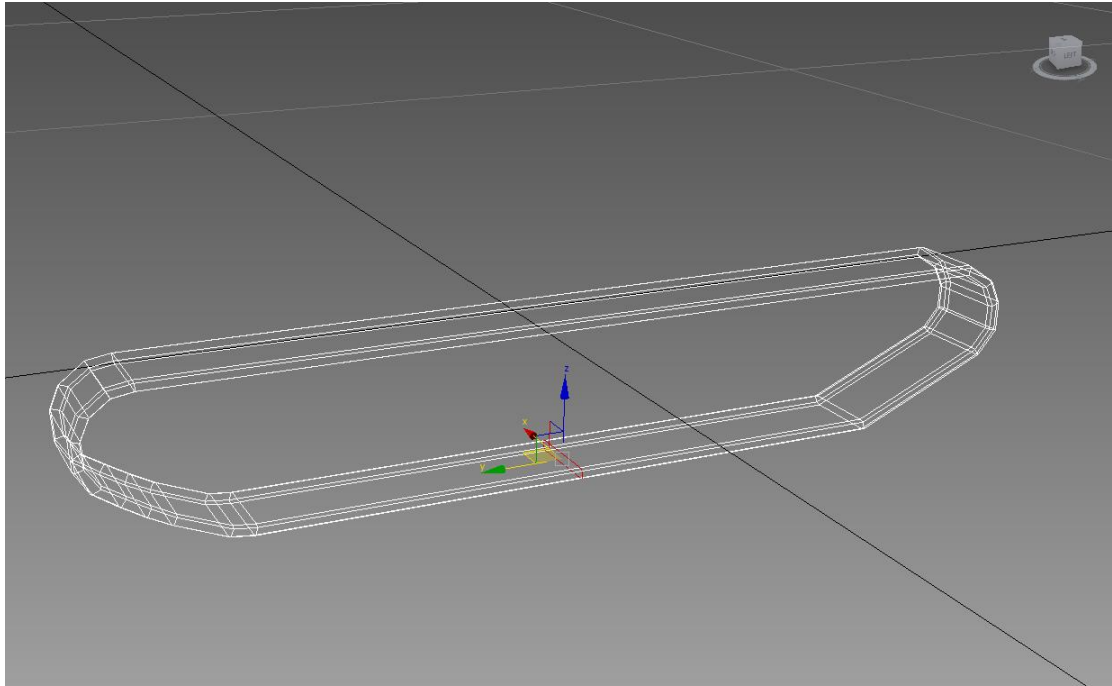


Click the connect command in the modifier:

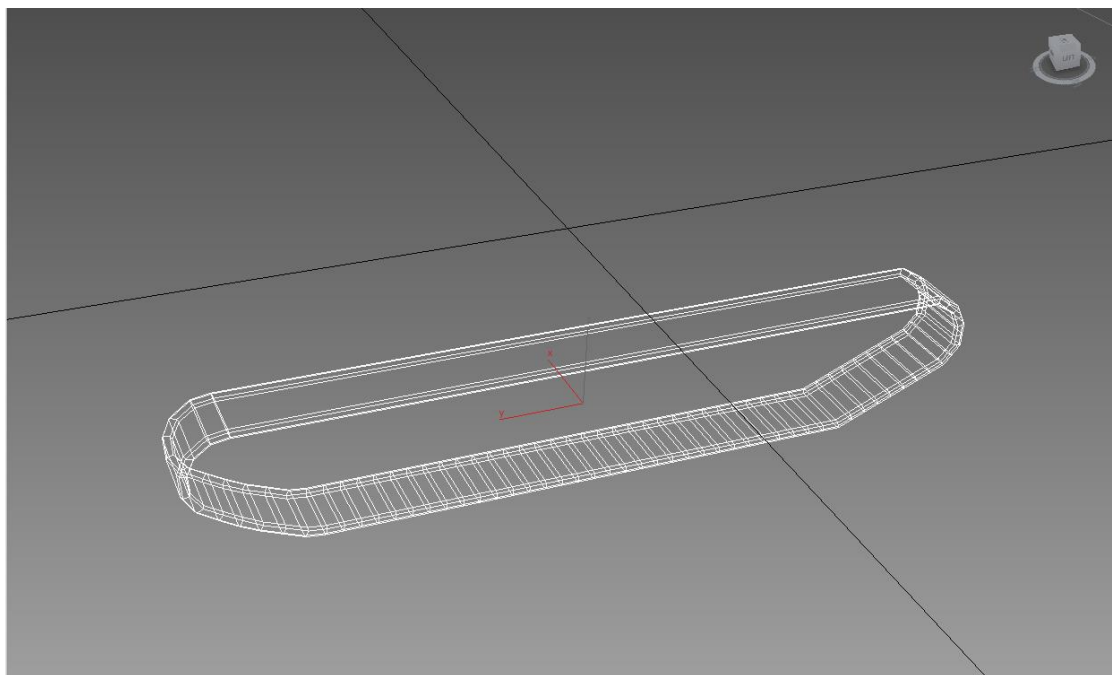
*Editable Poly->Edit edge->Connect*



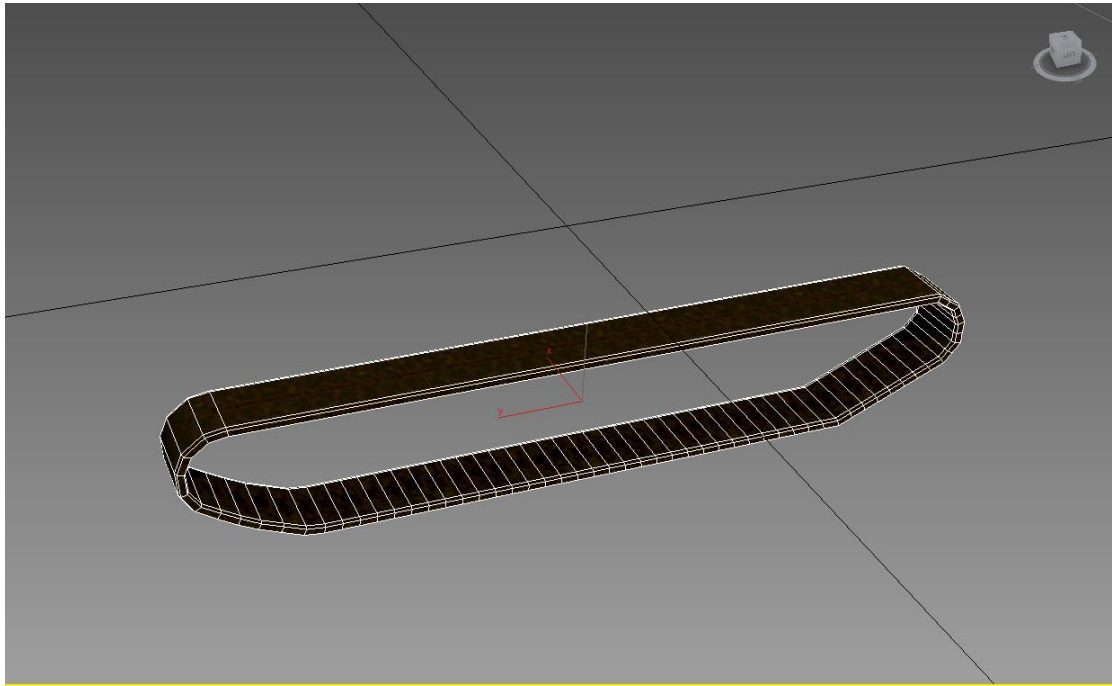
Now, we could see the bottom of track has been divided into two parts, and generates a circle of new line in the middle of track's bottom.



According to the principles above, subdivide other part of the track:



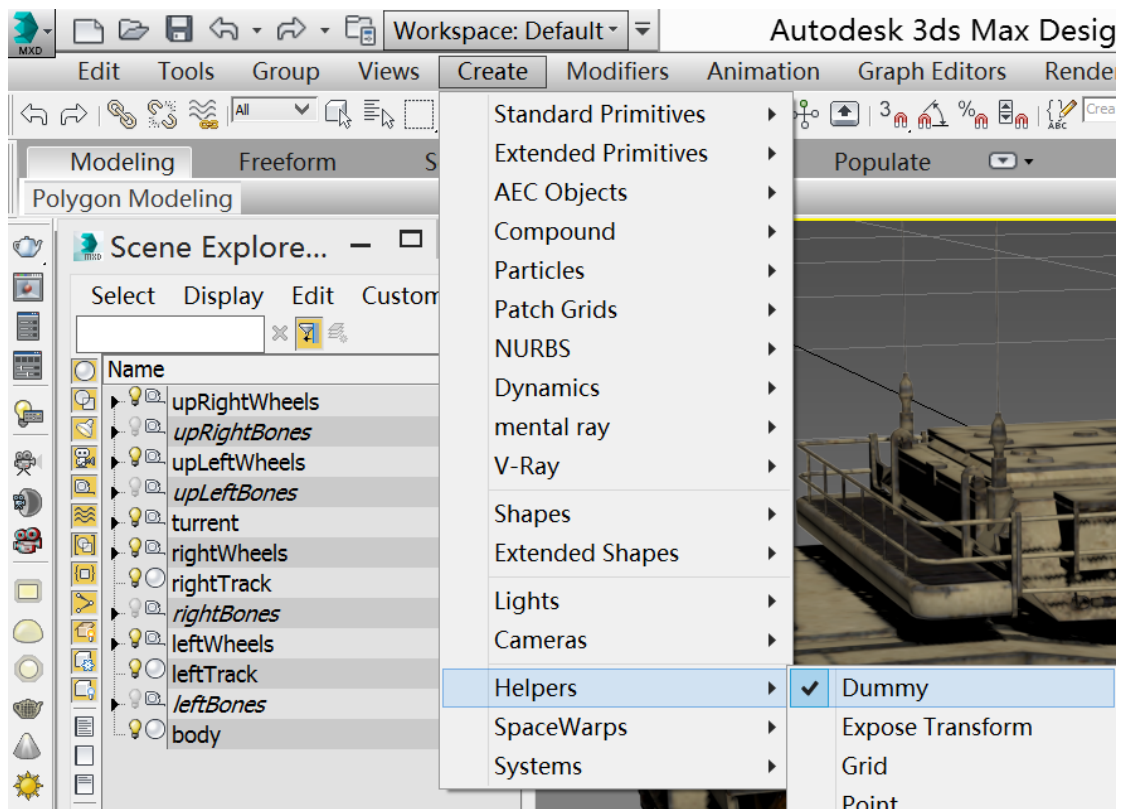
Press the F3 hot key, to make our display of the view switch to the shaded pattern.





### 3. Creating bones at each wheel's center

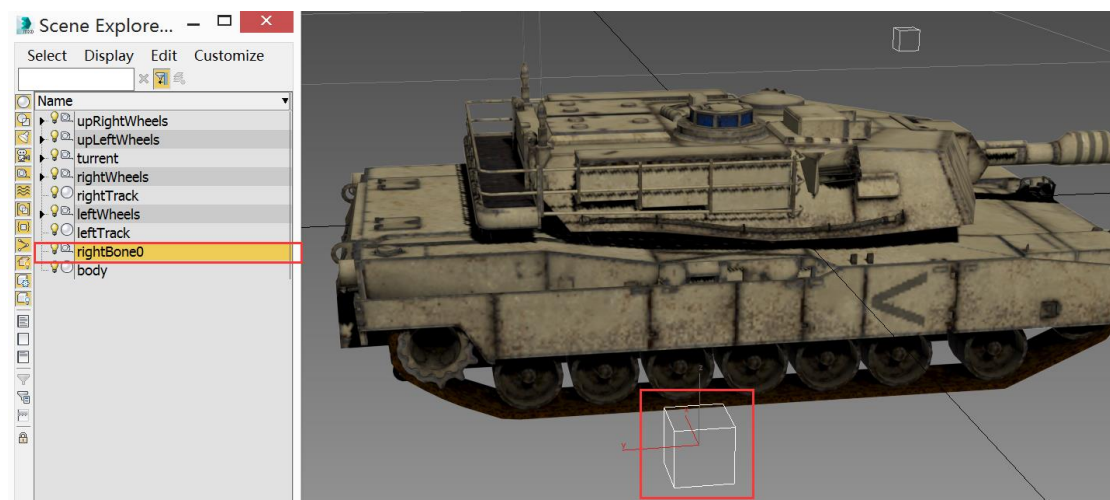
Selected the option in the menu bar: Create->Helpers->Dummy



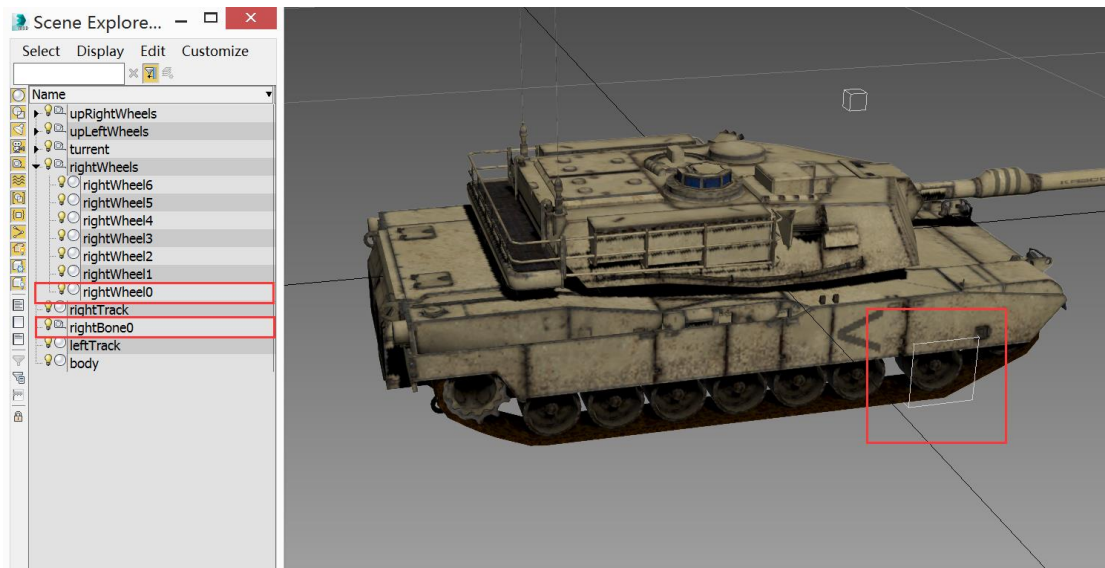
Create a dummy, and make it be the same size as the corresponding wheel as much as possible.



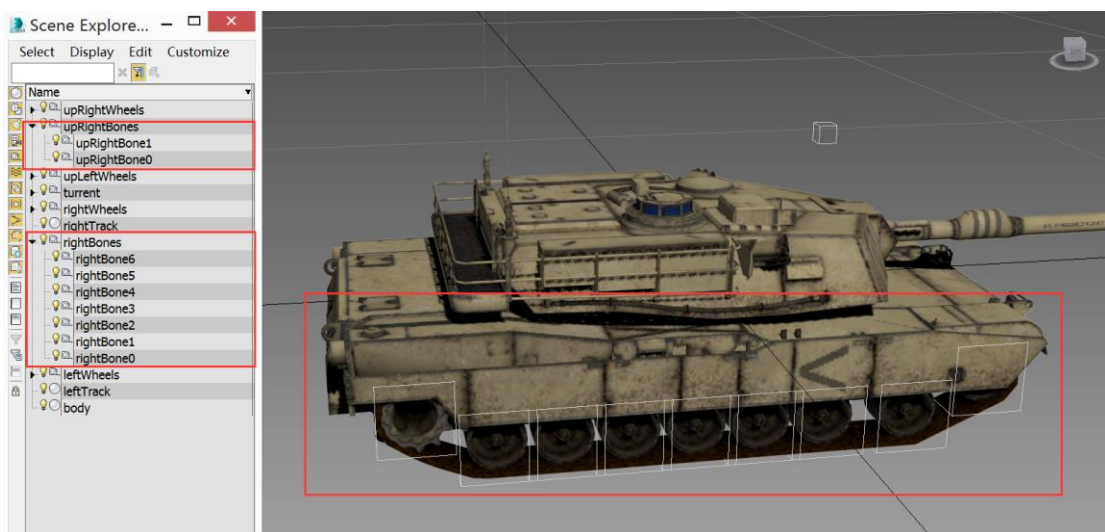
Rename the dummy to *RightBone0*



Then make its position coincide with the position of rightWheel0.

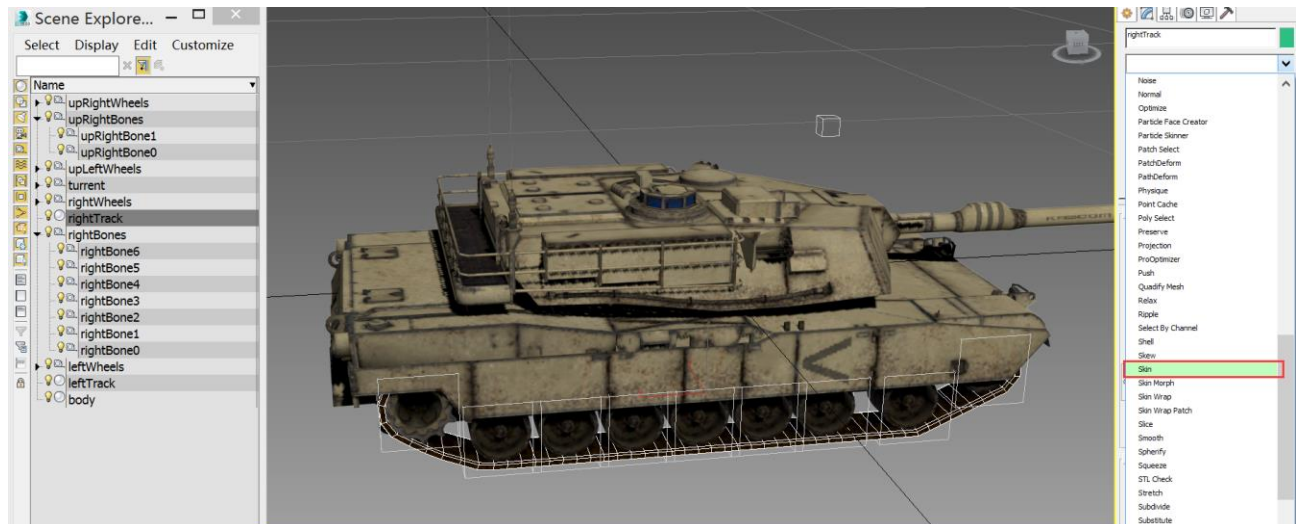


As the same principles above, we create the rest of wheel's bones, they are named: RightBone1, RightBone2, RightBone3, RightBone4, RightBone5, and RightBone6.



## 4. Adding skin modifier to the track

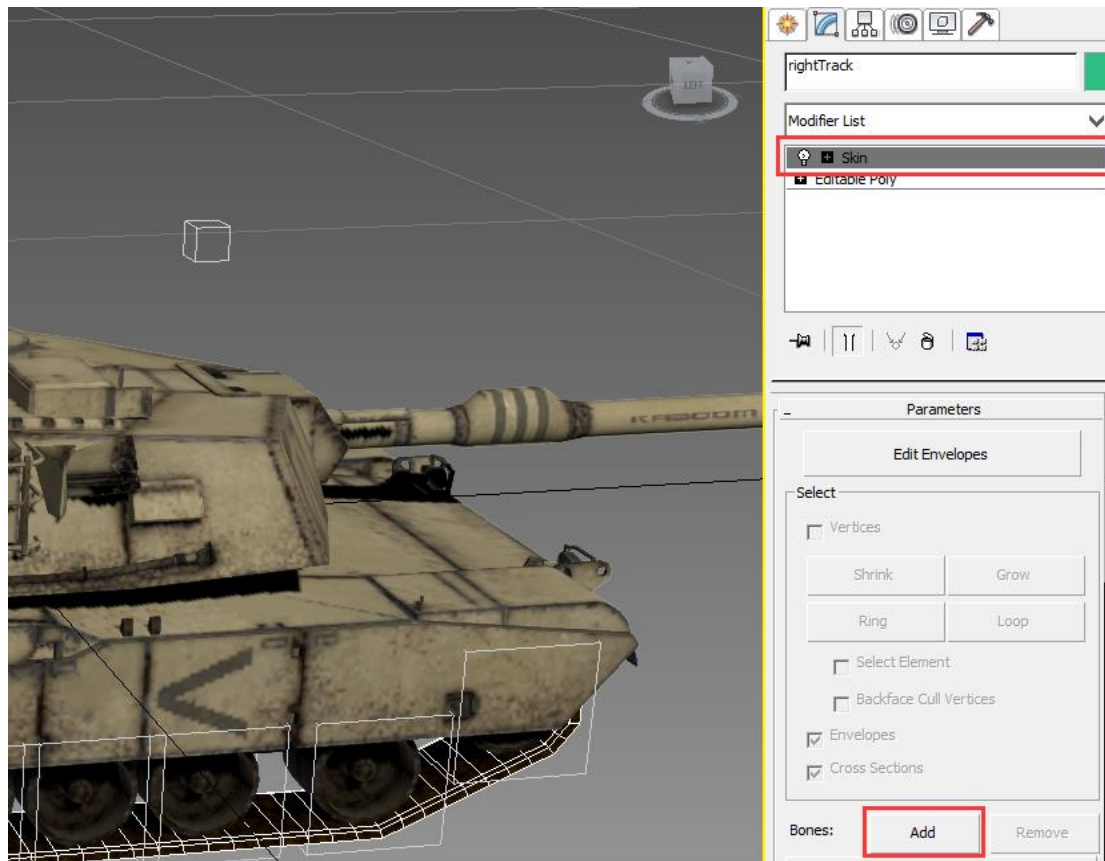
Selected the track, we add the skin to the track in the modifier's drop-down selection box



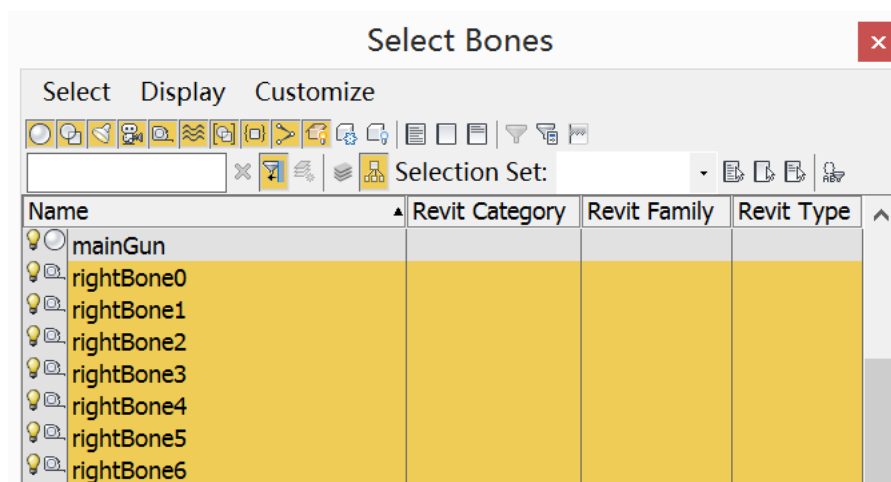
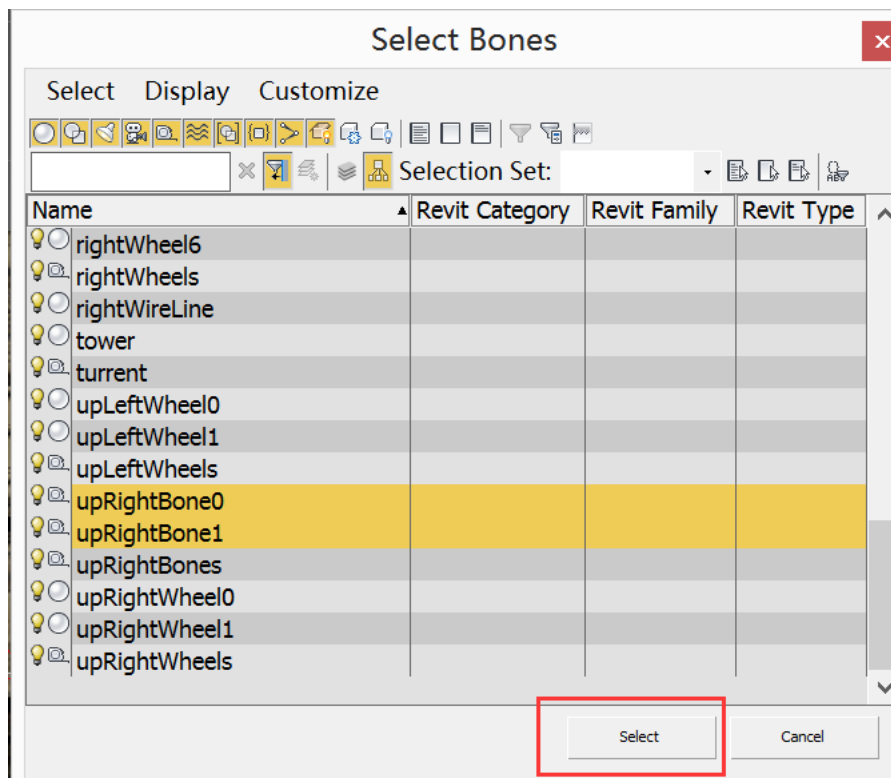
## 5. Binding bones for track's skin

Selected the track,click the add button in the skin modifier: Skin ->

Parameters -> Add

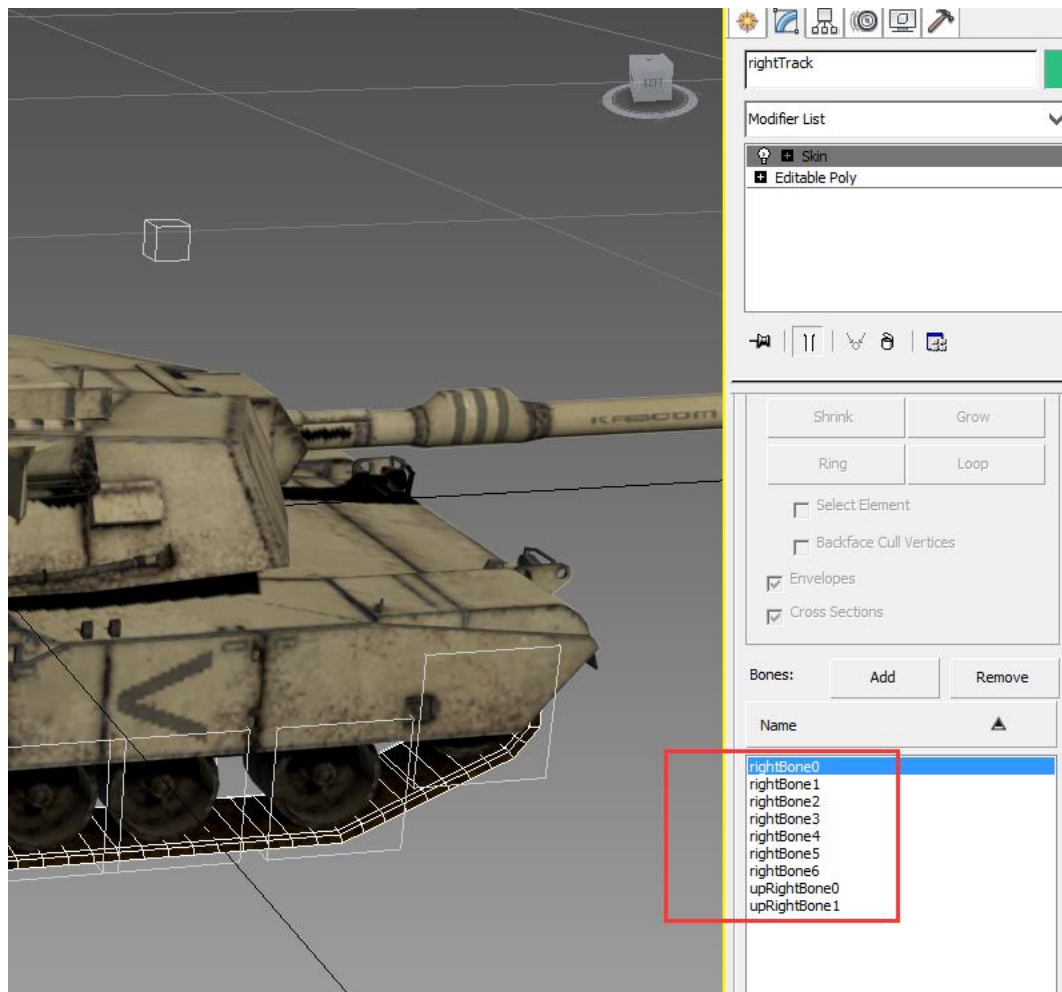


In the Select Bones Window which has been just popped up, we selected all the bones which we want to bind to the track's skin.



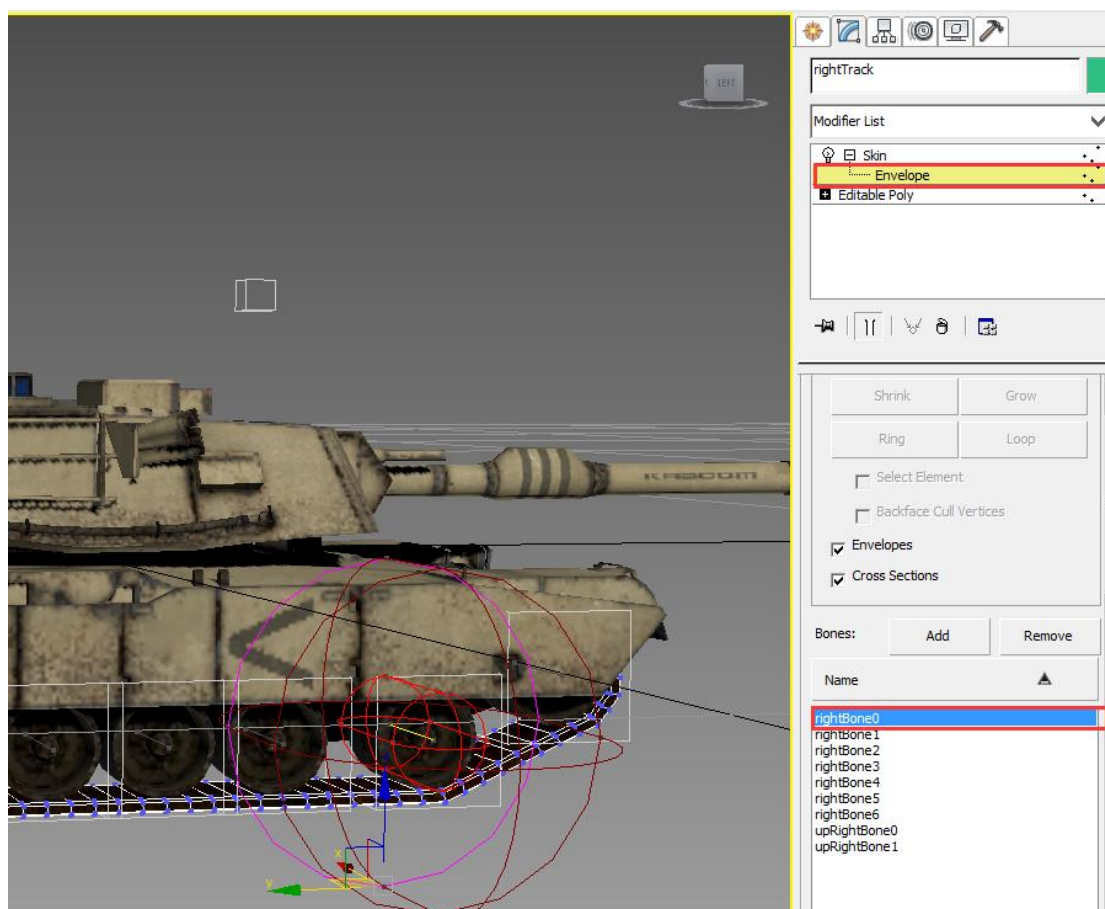
The names of bones which will be binding to the track' skin are  
upRightBone0, upRightBone1, rightBone0, rightBone1, rightBone2,  
rightBone3, rightBone4, rightBone5 , and rightBone6,  
then click the select button at bottom of the Select Bones Window





## 6. Adjusting the Weight setting for vertices with respect to rig bones

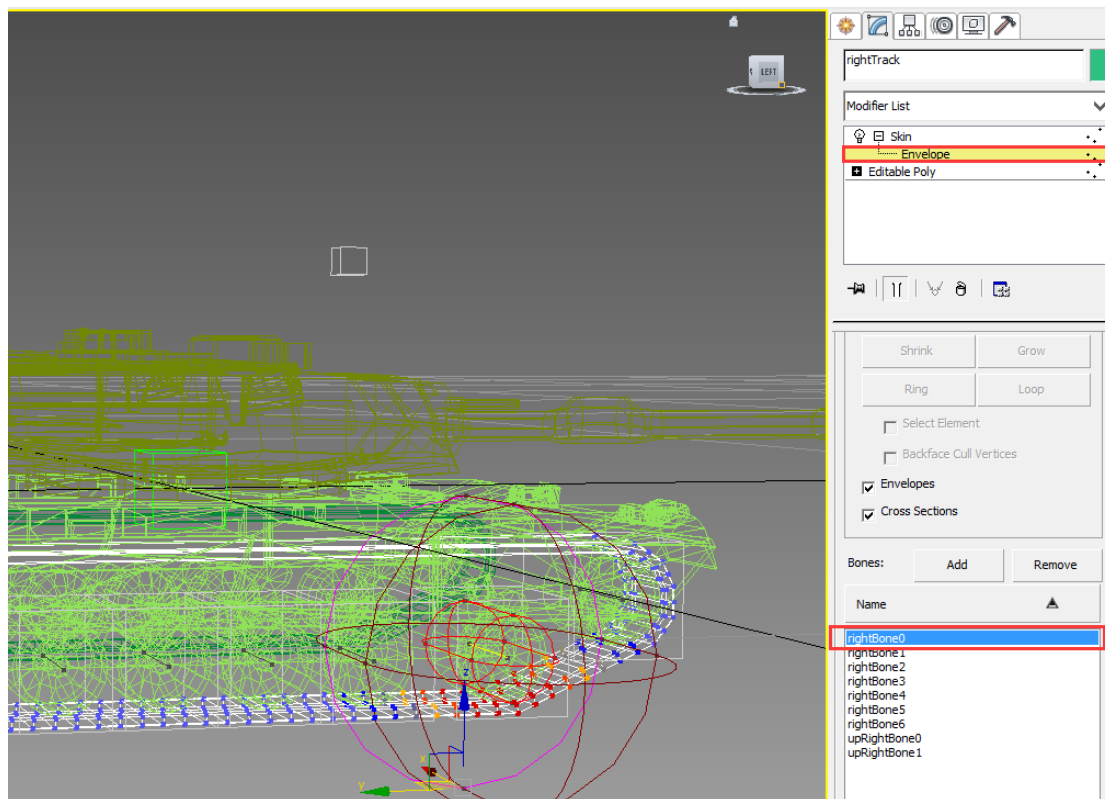
Selected the track, then selected the Envelop option in the skin modifier: Skin->Envelop.



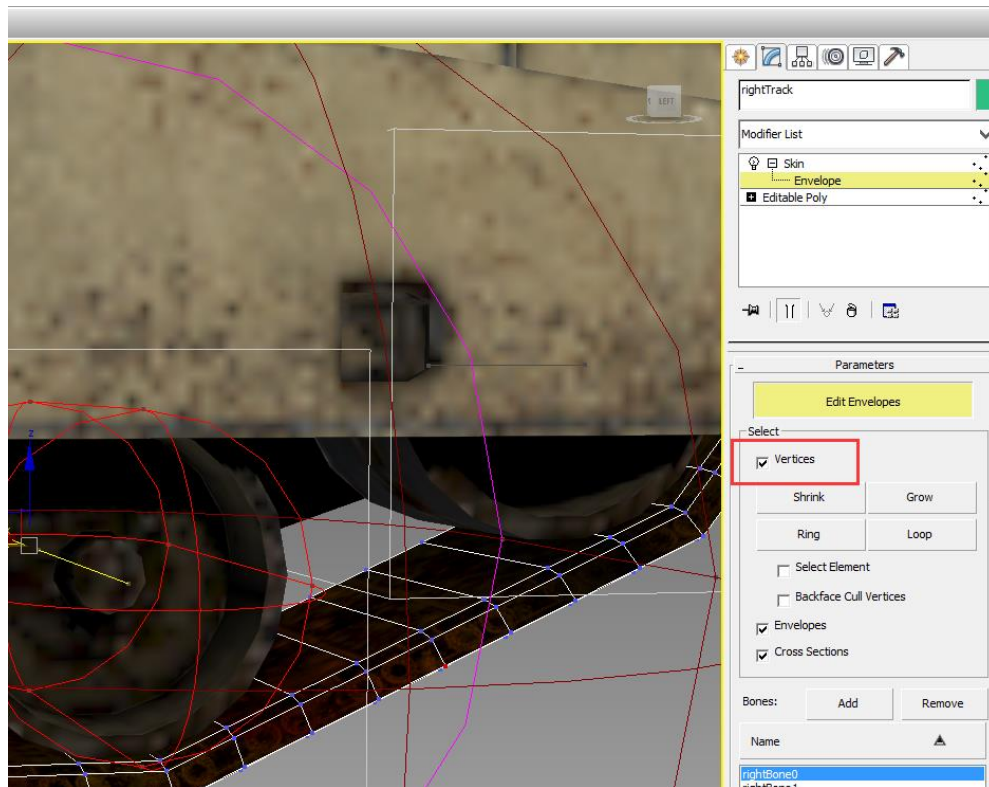


Press the F3 hot key, to make our display of the view switch to the wireframe pattern.

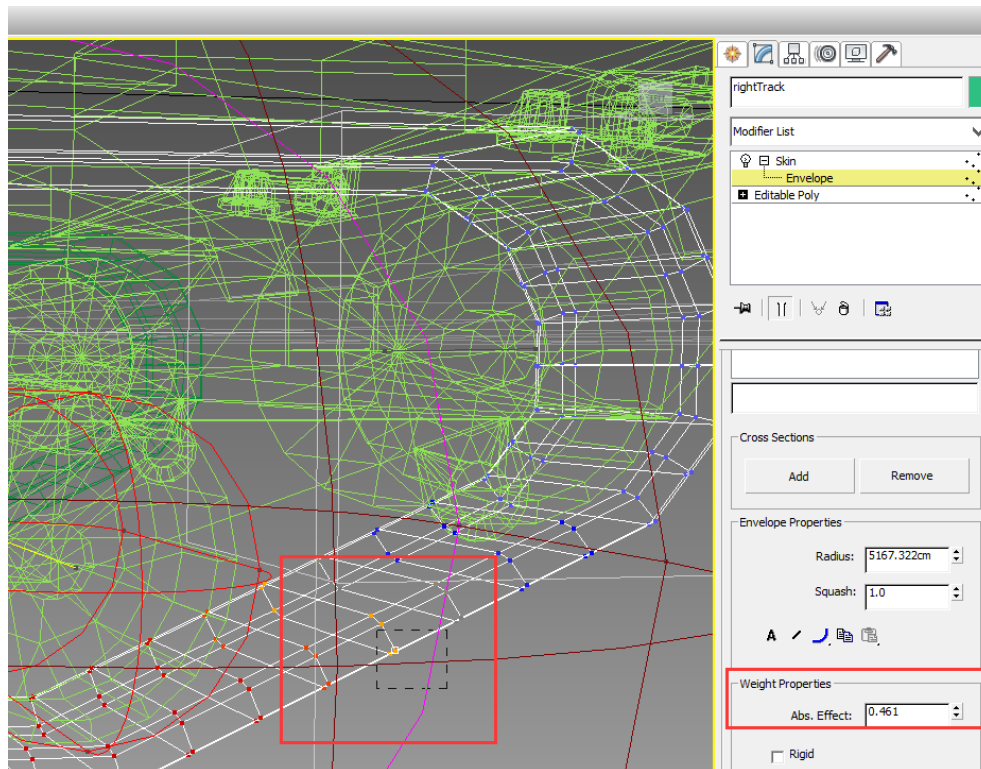
Now, we could see the weights of track skin's all the vertices which effected by the bone which we selected. (the vertex which color is red represents a larger weight value, while the vertex which color is blue represents a smaller weight value).



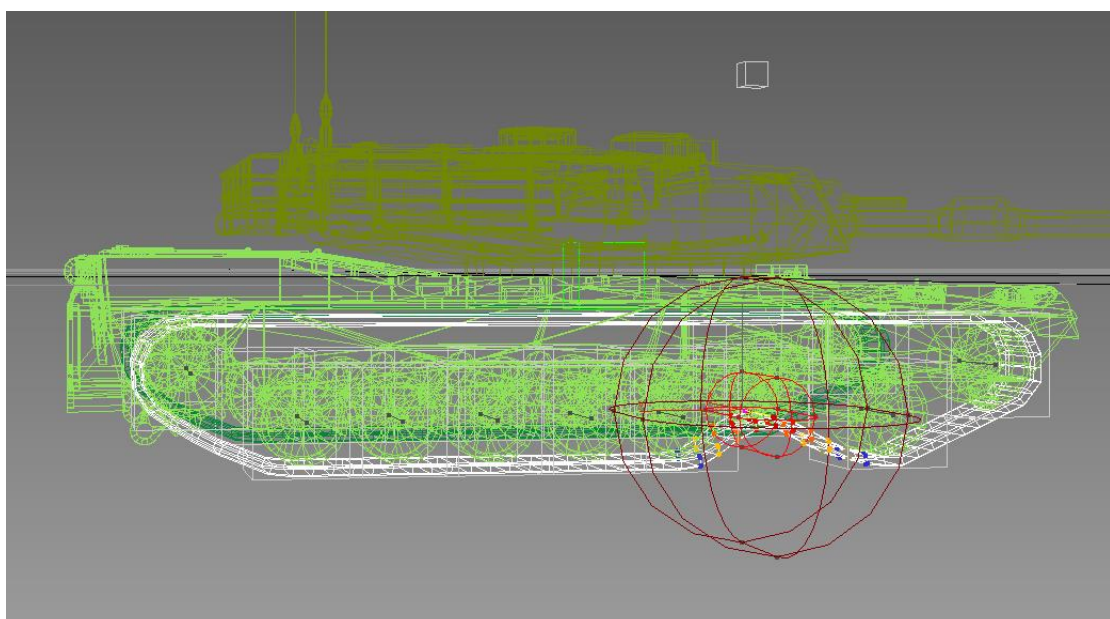
Selected the Vertices option in skin modifier: Skin->envelope->Vertices



If you want to change the weight value of the vertex effected by the bone that we selected, you can selected the vertex, and adjust the value of Abs.Effect in the skin modifier: Skin->Envelope->Weight Properties -> Abs.Effect.



As the same principles, in order to make the track's deformation reach the best performance when the bone generate the displacement, you can adjust weight value of each vertex effected by corresponding bone.

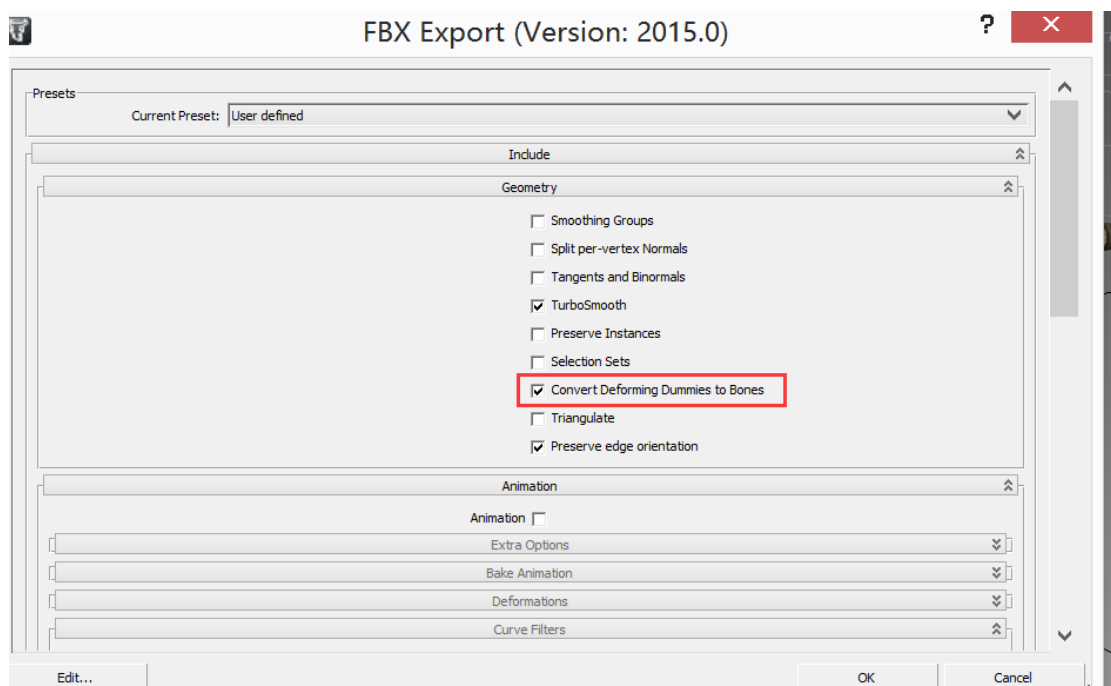




## 7. Export tank model to FBX format

When export the model to FBX format, Don't forget to check this option:

*Convert Deforming Dummies to Bones.*



## **8. Contact information**

If you have technical difficulties, please contact me by email. My email address is [18311310080@163.com](mailto:18311310080@163.com)