

Unsung M35 truck conversion

After having some fun with cubes to get a foundation for working with Arma Reforger's workbench, it's time to tackle a somewhat bigger - if not too big - project: Converting the Arma 3 Unsung M35 truck by RamaMarines into Arma Reforger.

The M35 truck was kindly donated by RamaMarines to Unsung for Arma 3. It is a great model and texture set, but it was hampered by performance problems in Arma 3. For Arma Reforger my hope is that the model and texture set as is will be performant enough.

Setting up the project

First I set up a new project in workbench named `uns_m35`, just after the pbo name of arma 3. After double clicking the `addon.gproj` I merely change the Title to `Unsung M35 truck`.

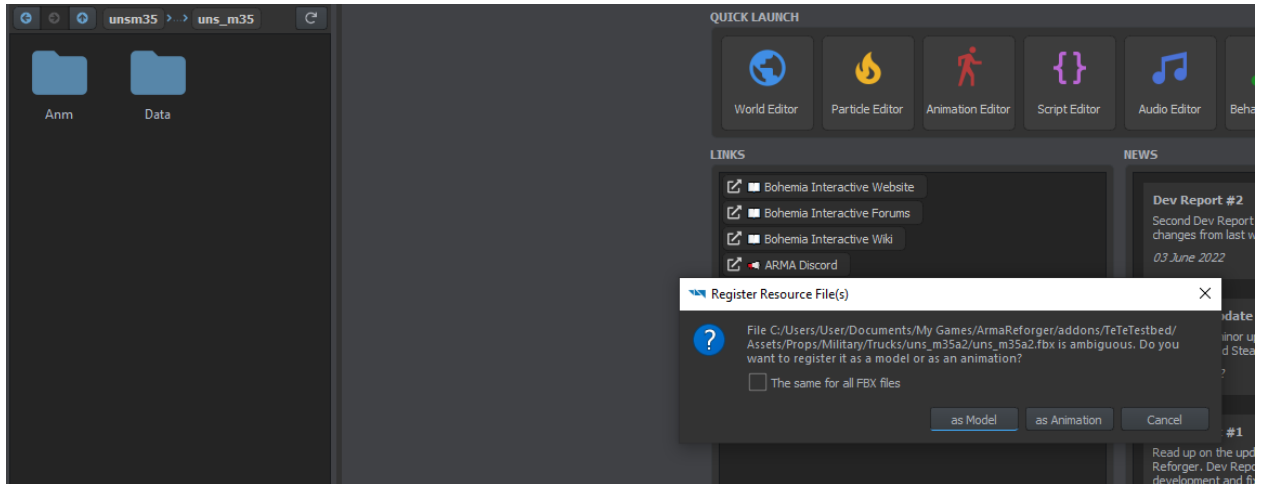
Next we need a basic directory structure to support the M35 development. For this I visit the Arma wiki at https://community.bistudio.com/wiki/Category:Arma_Reforger/Modding/Tutorials and specifically https://community.bistudio.com/wiki/Arma_Reforger:Vehicle_Creation

The tutorial contains the needed information in the **Preparing Structure** section. I create this directory structure below the `addons/uns_m35` project directory:

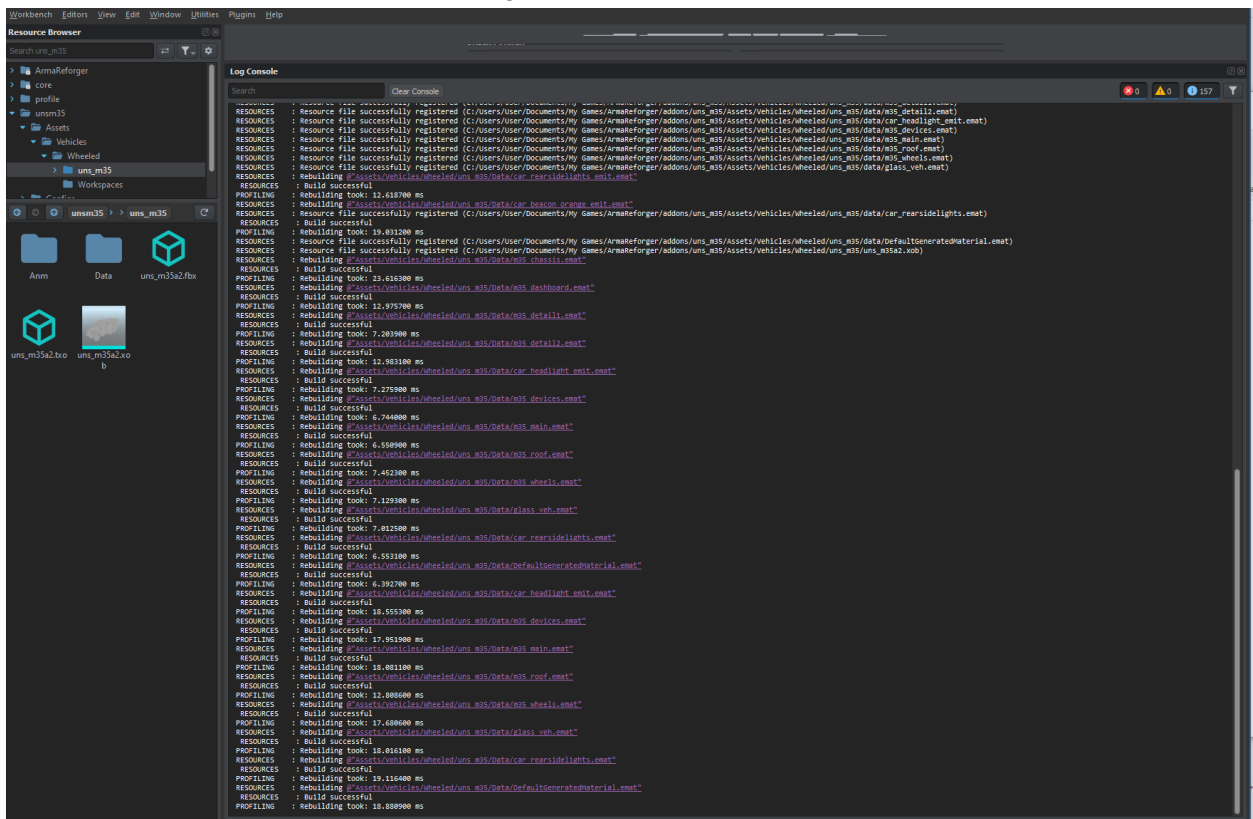
```
./Assets
./Assets/Vehicles
./Assets/Vehicles/Wheeled
./Assets/Vehicles/Wheeled/uns_m35
./Assets/Vehicles/Wheeled/uns_m35/Anm
./Assets/Vehicles/Wheeled/uns_m35/Data
./Assets/Vehicles/Wheeled/Workspaces
./Configs
./Configs/Editor
./Configs/Editor/PlaceableEntities
./Prefabs
./Prefabs/Vehicles
./Prefabs/Vehicles/Wheeled
./Prefabs/Vehicles/Wheeled/uns_m35
```

Setting up the model

My first step to get the model into Arma Reforger is to add the fbx export of the M35 into the `Assets/Vehicles/Wheeled/uns_m35` directory. A simple drag and drop from the Windows explorer to the Workbench is all that is needed to initiate the import and register process:



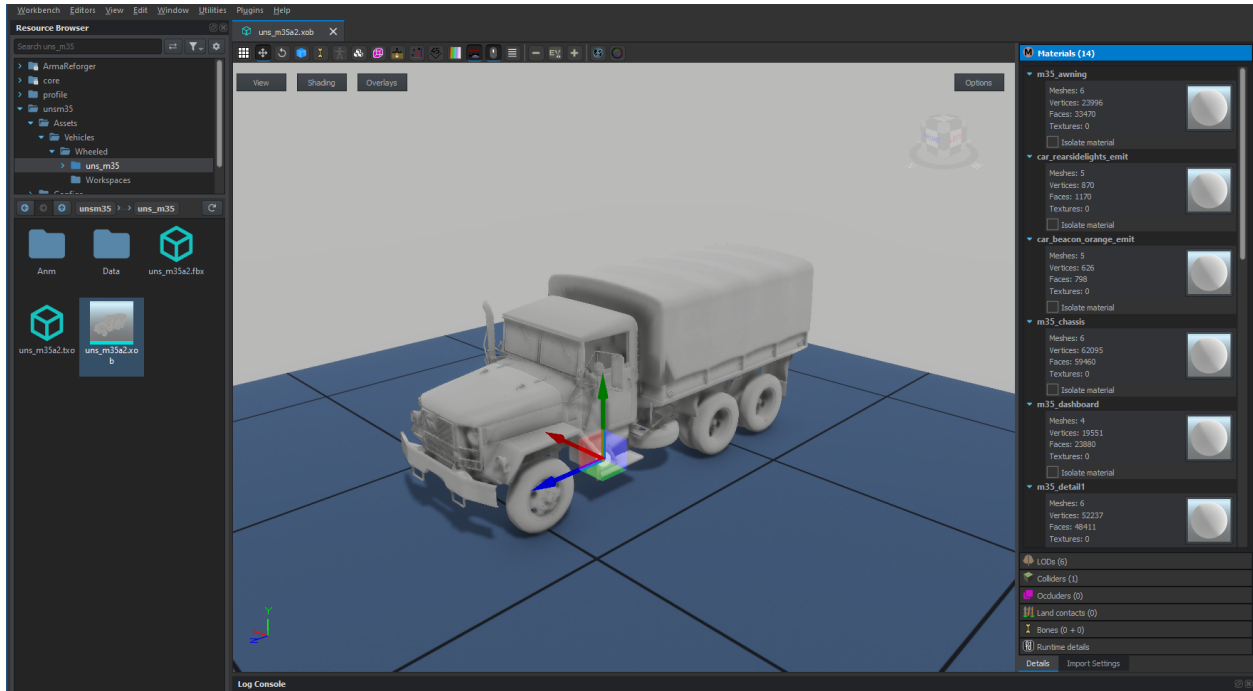
After a minute or two the import and registration process has been completed:



Besides the fbx two new files, the xob and txo, have been created, as well as a load of emat files in the Data directory.

Note that the model has parts of the Sample Car skeleton to get it working in Arma Reforger.

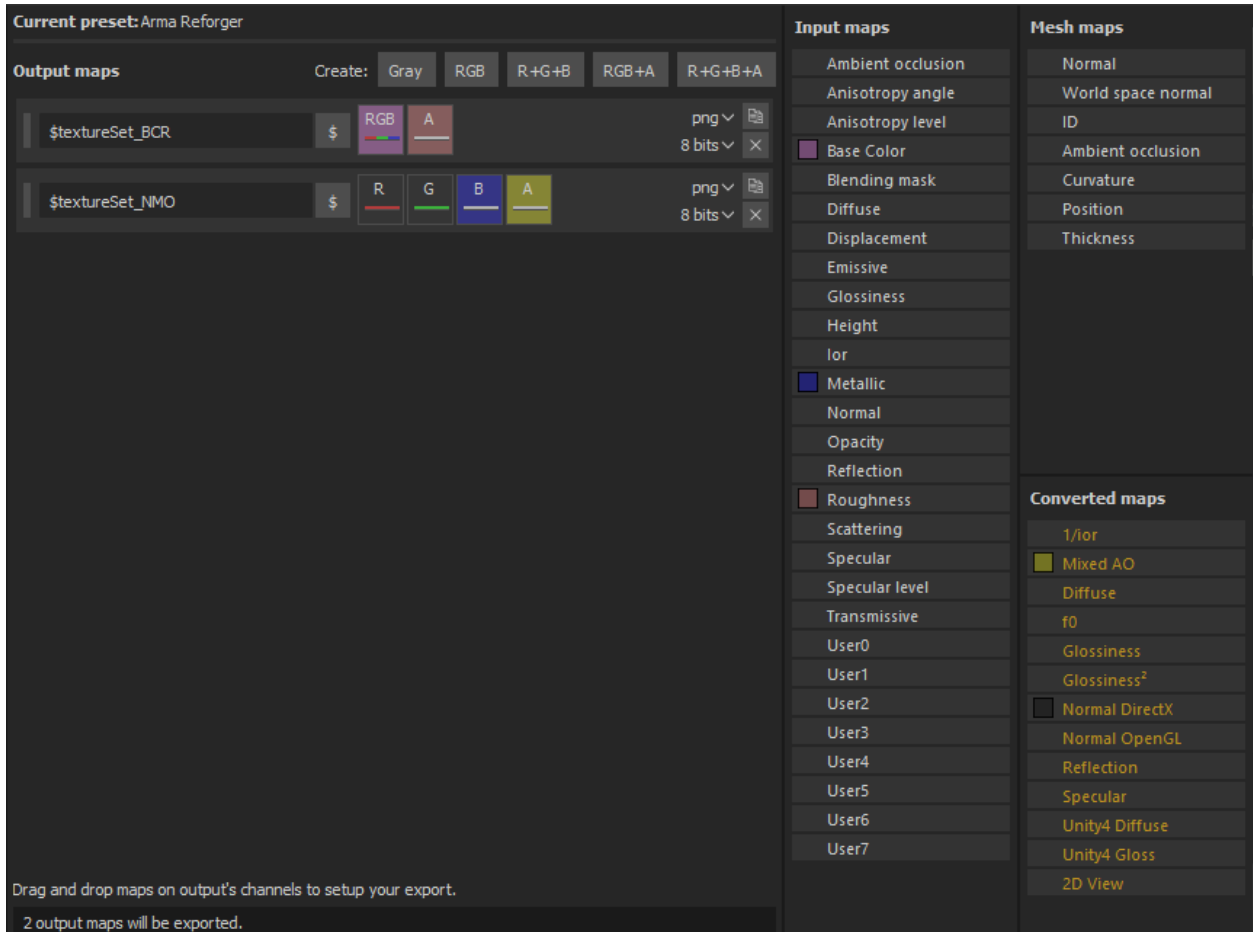
Now I take a first look at the model by double clicking the xob file in Workbench.



Setting up initial textures and emats

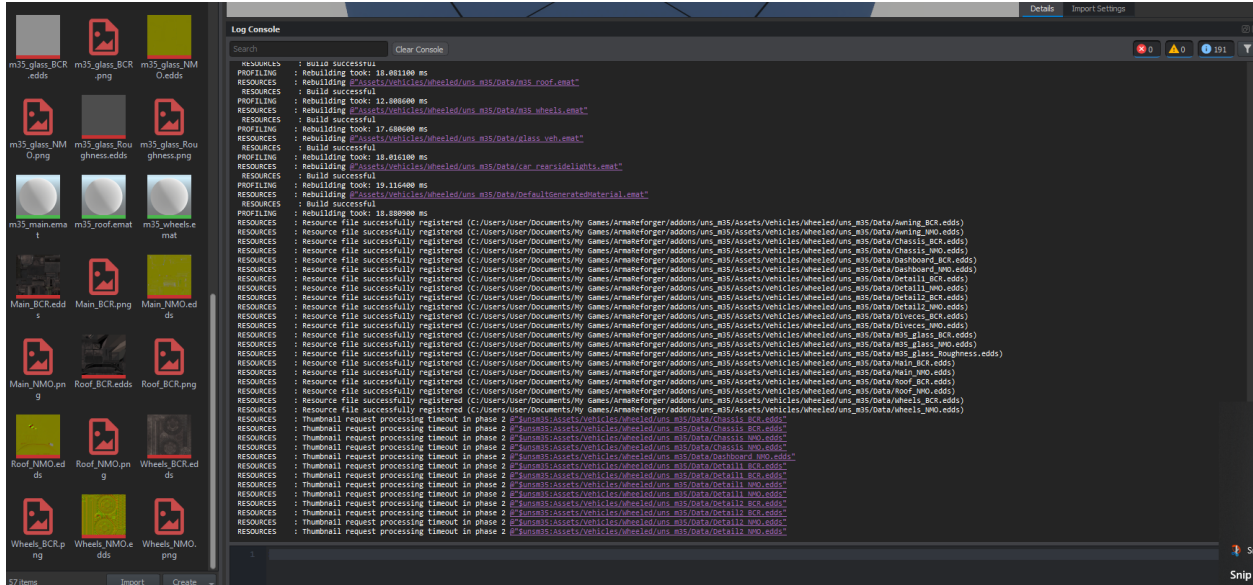
The truck is there, but untextured. On the right side of the viewer we see that a number of materials has been detected, namely those emat files from the Data directory created during import.

My initial idea was to merely recycle the paa's from the Arma 3 truck and start from there. But after some testing this proved to be not sufficient. With Arma Reforger the PBR process for textures is better observed and hence I reached out to RamaMarines, the modeler and texturer behind the Unsong M35, to get the needed files in the appropriate format. In the texture channel of the Arma discord for enfusion a setup for exporting from Substance Painter can be found:



With help of this RamaMarines sends me a bunch of BCR and NMO texture files, which I then place in the Data directory via drag and drop from Windows Explorer into the Workbench.

During the import and registration process the PNGs are converted to the edds format used by Arma Reforger.

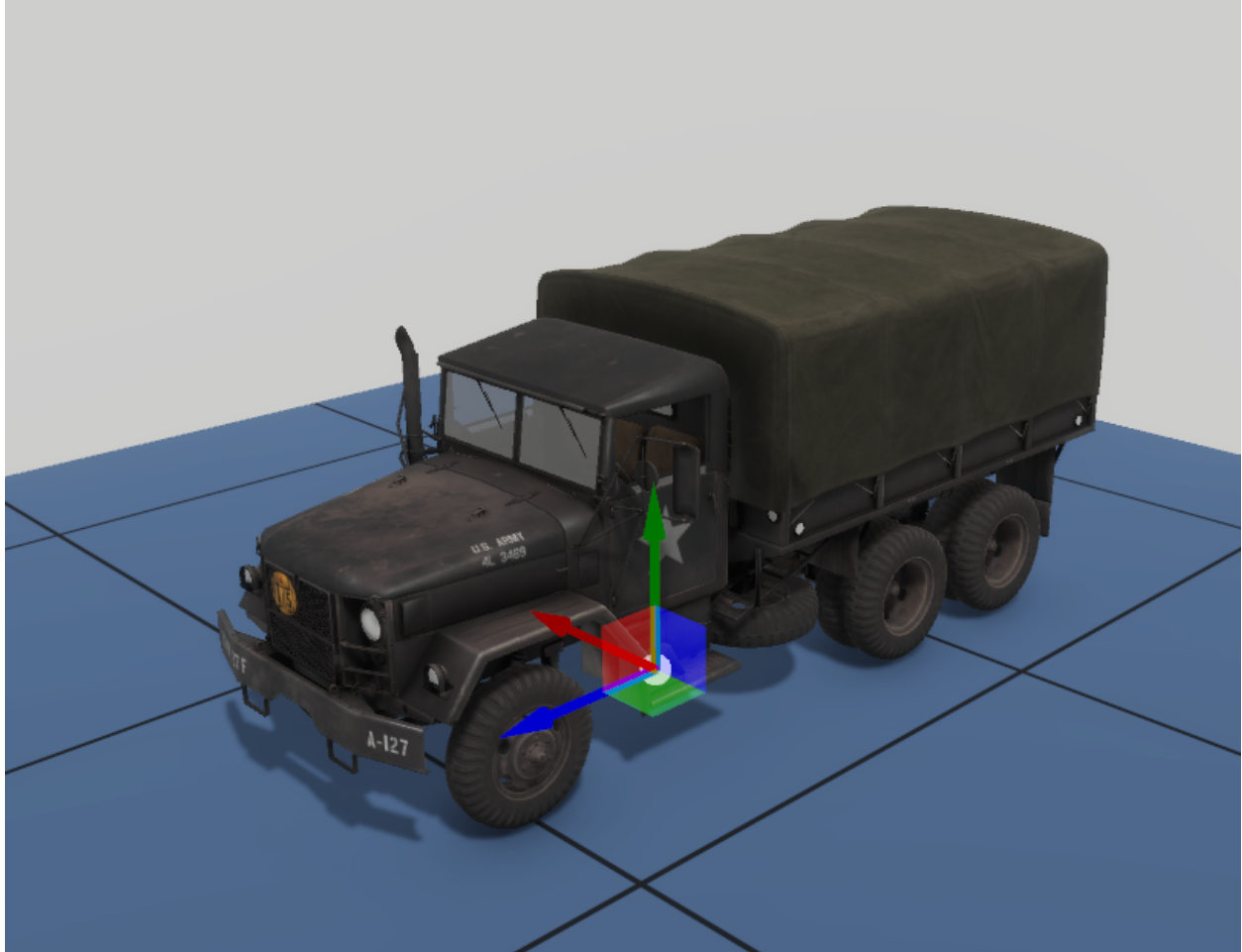


Next I assign the edds files to the emat by double clicking the emat name and drag and drop to the BCR and NMO map, leaving the Opacity Map empty.

But before we can see the material applied to the xob model, I need to alter the import settings and check the **Export Skinning** box. I get this warning now, which is explained on the wiki:

RESOURCES (W): Missing some mesh skinning weights (Object_LOD0). Weighting them to root.

The basic setup of model and textures is completed - for now. But we can revisit the import and update process anytime. I usually update the fbx and png's from Windows Explorer and while Workbench is running, any changes will lead to a re-import and rebuild of the truck.



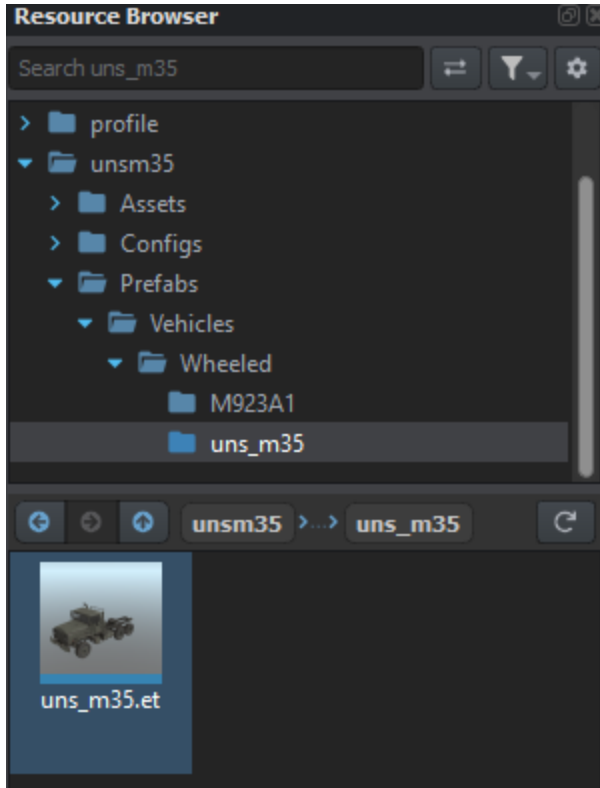
Creating the prefab

Anyone familiar with Arma 3 modding will recall the next steps, create a `config.cpp` and `model.cfg` for the `p3d` model and try to encode the vehicle properly for the game.

In Arma Reforger this is replaced by a system dubbed prefabs. A prefab is a collection of configuration settings, at least to my current understanding.

In Arma 3 I'd simply inherit from an existing vehicle and replace the `model` and `displayName` fields in the `config.cpp` for a start. Here I try something similar, taking the Arma Reforger M923 truck prefab as a start.

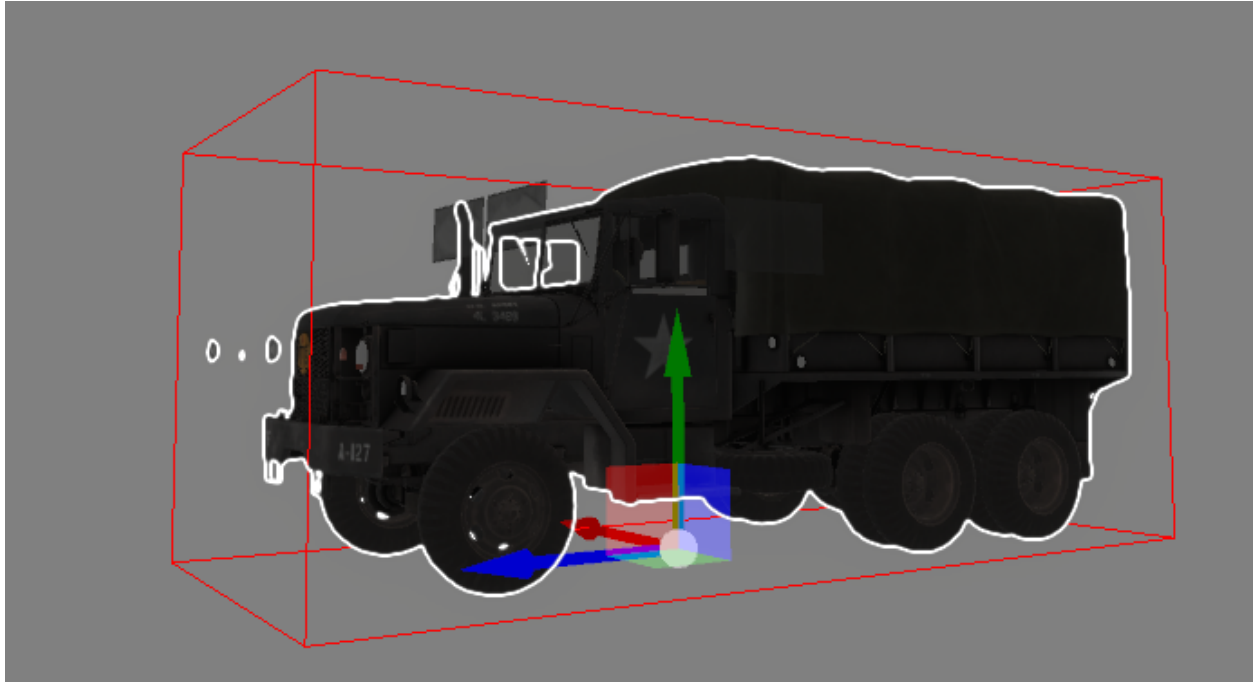
In the Workbench resources browser I search for the `M923A1.et` file and with right click duplicate it into my `uns_m35` project. It will be placed in the `prefabs` directory and from there I move and rename it to `uns_m35.et`:



With a double click I open the prefab and select edit prefab on the right side menu. Now the World Editor opens and I adjust the Component configuration elements to my liking.

MeshObject

Here I change the M923A1_BASE.xob to the uns_m35.xob. On the lower right I hit Apply to prefab and select the prefab in my project, save the world with `ctrl-s` to persist this prefab change and now the correct model should be used.



As you see in the picture, lights and windows have somehow become duplicated or so.

SlotManagerComponent

In Arma Reforger additional models can be associated with a vehicle/entity via the SlotManagerComponent. In case of the M923A1 the windows are placed via the SlotManagerComponent. As the windows are embedded in the M35 truck model, I simply disable the component for now.

Object Properties

Vehicle: uns_m2

slot

Vehicle

SlotManagerComponent

Search: Entity instance

Unsorted

Enabled

Slots (6)

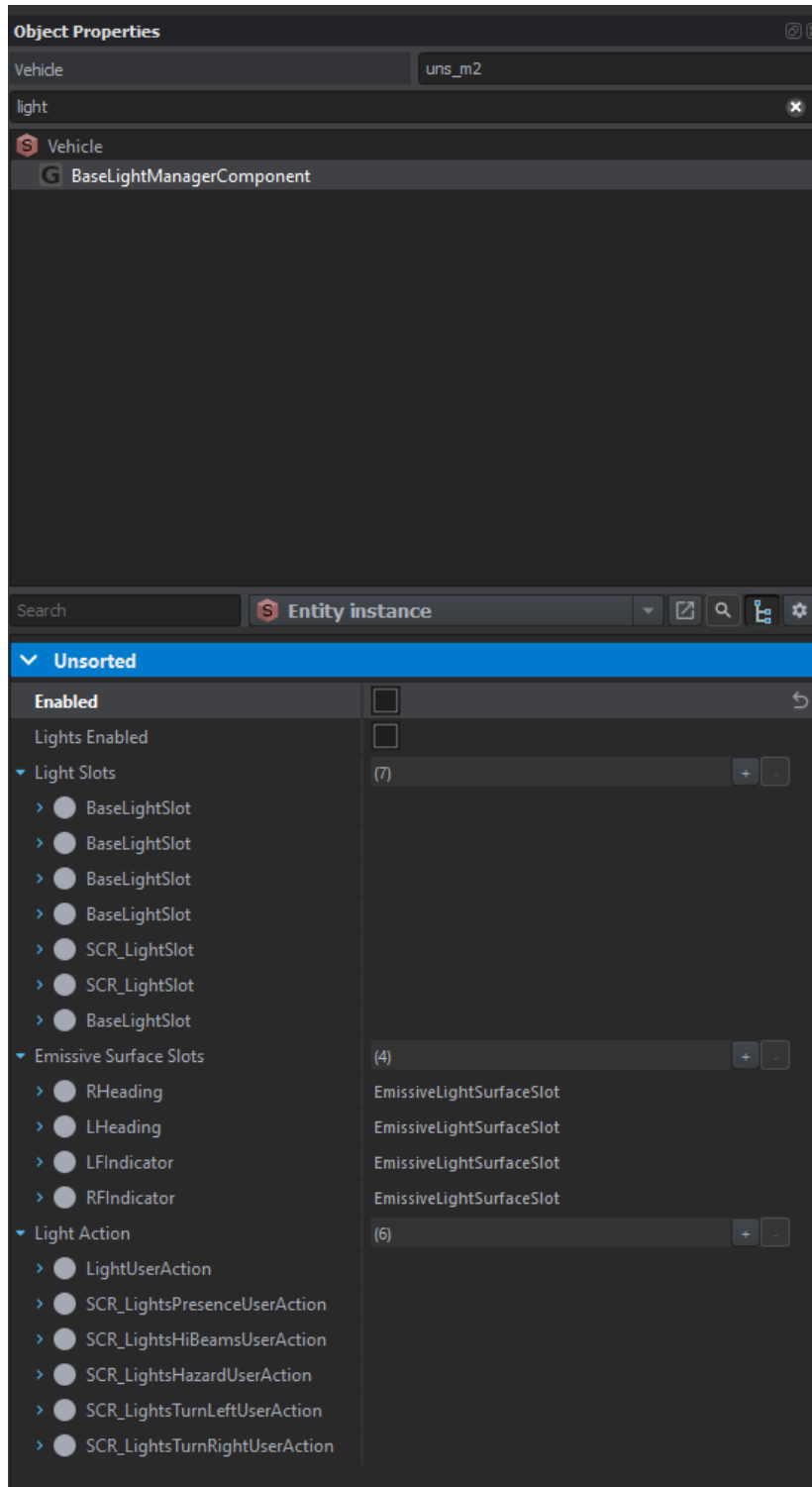
- RegisteringComponentSlotInfo
 - RegisteringComponentSlotInfo
 - Pivot ID: v_door_l01
 - Offset: X 0 Y 0 Z 0
 - Angles: X 0 Y 0 Z 0
 - Auto Transform:
 - Child Pivot ID:
 - Enabled:
- Prefab**
 - M923A1_window_left.et
 - Disable Physics Interaction:
 - Inherit Parent Skeleton:
 - Activate Physics On Detaching:
 - Deactivate Physics On Attaching:
 - Register Actions:
 - Register Damage:
 - Register Controllers:
 - Register Weapons:
 - Register Compartments:
 - Register Lights:
- RegisteringComponentSlotInfo
 - RegisteringComponentSlotInfo
 - RegisteringComponentSlotInfo
 - RegisteringComponentSlotInfo

Slot Mappers (6)

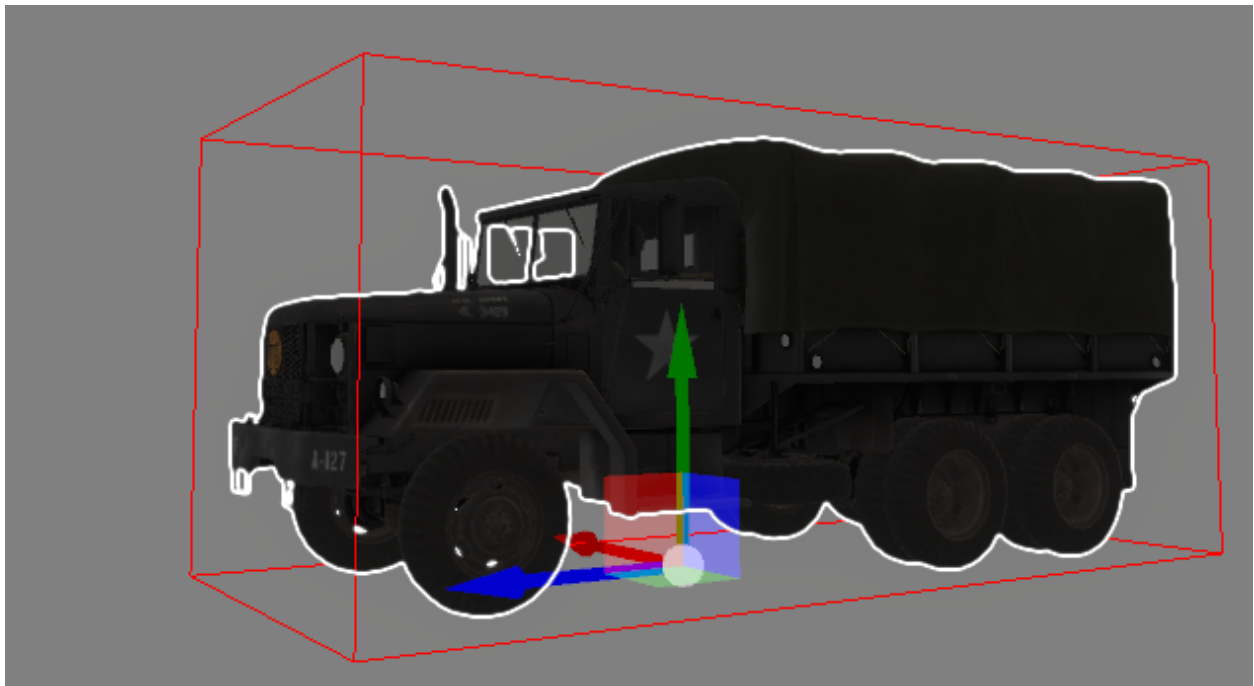
- CompartmentToSlotMapping
 - CompartmentToSlotMapping
 - CompartmentToSlotMapping
 - CompartmentToSlotMapping

BaseLightManagerComponent

The same as for the windows is true for the lights. They are associated with the truck via the BaseLightManagerComponent, which I disable for now.

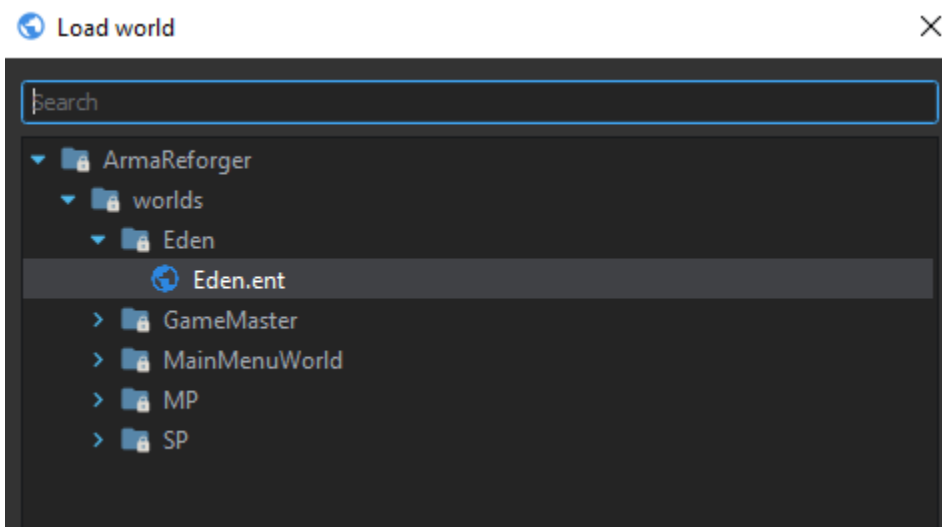


Now the M35 truck looks slightly better:

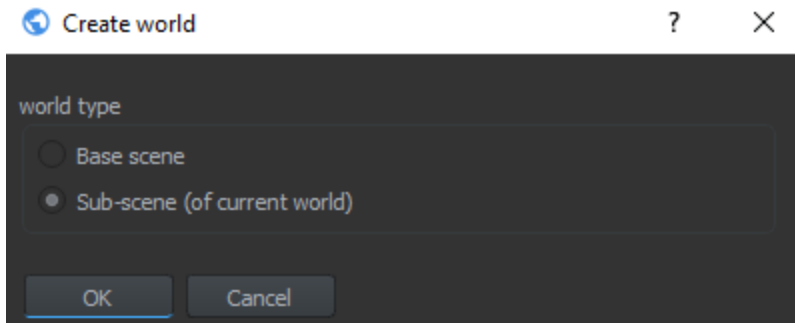


First test

With the M923 base for the M35 it's time for a first test on Everon. After applying my changes to the prefab and saving the world to persist the prefab changes, I load a world:



In the hierarchy menu on the left side I select Airfield and jump to it via the F key. Before I change anything, I create a new world as subscene of Everon:



Next I save the world in my project as TeTeTEden and use this as a base.

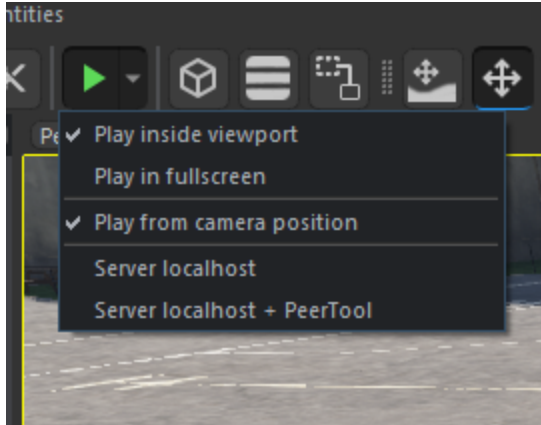
Creating the truck

With the airfield in sight, I select my prefab from the resource browser of the World Editor and drag and drop it onto the tarmac.



Starting the preview

Now it's time to get into the game. I select some options on the green play button:



The truck is slightly tilted, but basically in game now:



I enter as driver, start the engine and it moves, albeit with wheels being all over the place:



What happened here? Similar to the windows and lights I copied some settings of the M923 truck that do not apply to the M35 truck properly.

Adjusting the prefab

With help from the Arma Discord I learned that the animations for the M923 might get into the way of the M35 working. Specifically the wheel positions are very different. In the components there are two found when searching for anim:

Object Properties ⊞ ⊞

Vehicle uns_m1

anim ×

- Vehicle
 - CarProcAnimComponent
 - VehicleAnimationComponent**

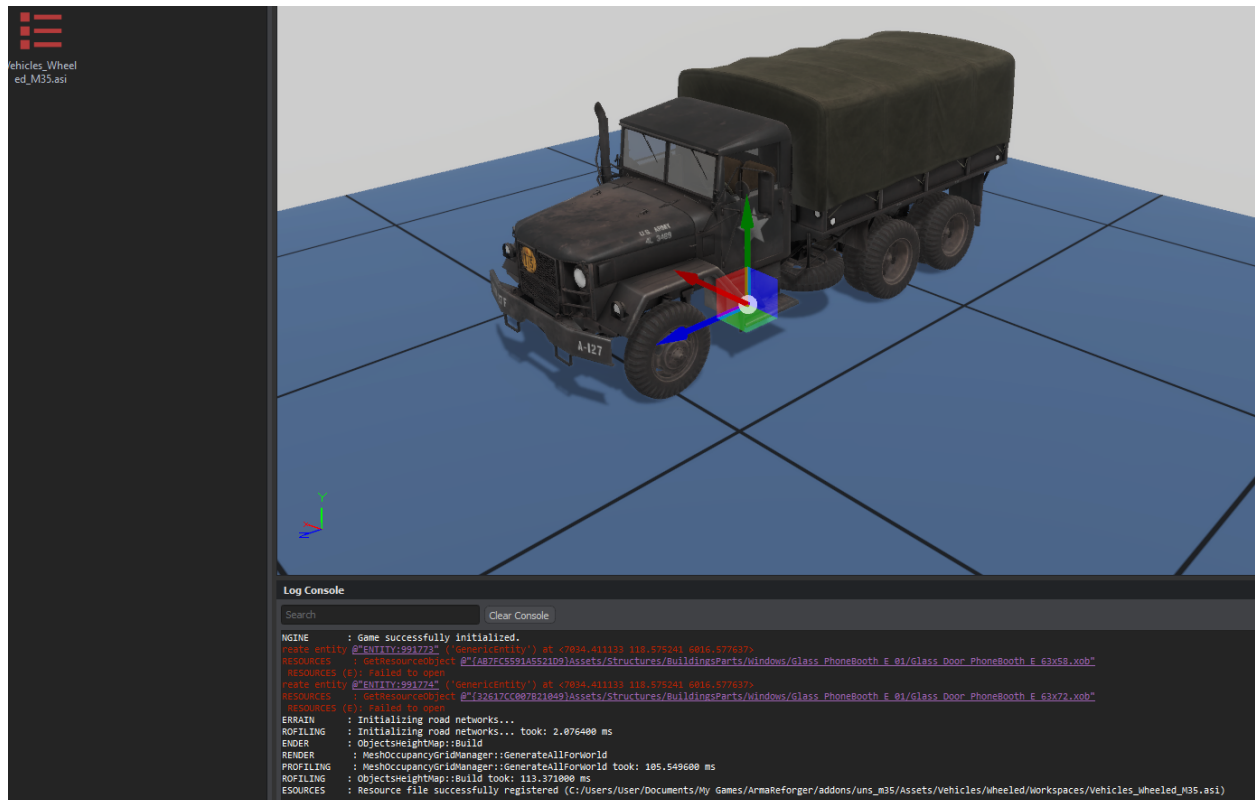
Search Entity instance ⊞ ⊞ ⊞ ⊞ ⊞

Unsorted

Enabled	<input checked="" type="checkbox"/>
Anim Graph	M923A1.agr ⊞ ⊞ ⋮
Anim Instance	M923A1_vehicle.asi ⊞ ⊞ ⋮
Start Node	MasterControl
Always Active	<input type="checkbox"/>
Anim Injection	AnimationAttachmentInfo
Anim Graph	M923A1.agr ⊞ ⊞ ⋮
Anim Instance	M923A1_player.asi ⊞ ⊞ ⋮
Start Node	MasterControl
Binding Name	Vehicle
Bind With Injection	<input type="checkbox"/>
Auto Command Bind	<input checked="" type="checkbox"/>
Auto Variables Bind	<input checked="" type="checkbox"/>
Mesh Visibility Configurations	(0) + -
Reset On Deactivation	<input checked="" type="checkbox"/>
Simulate On Headless	<input checked="" type="checkbox"/>

VehicleAnimationComponent

Here we have the M923A1_vehicle.asi animation, that seems to cause the problem. In a first attempt I tried to replace all animations and animation graphs with empty ones, but this simply resulted in a non moving truck. Hence my next attempt is to create a vehicle.asi animation and try that instead. As I have basically no idea how to do so, I take the Sample Cars asi file, rename it to Vehicles_wheeled_M35 and place it in the Workspaces directory.



Then I point the VehicleAnimationComponent Anim Instance to it.

Now my M35 truck halfways decently:



TODO

Of course there are many open points not addressed by this somewhat naive conversion attempt so far:

- The tilted approach of the truck when driving - the debug info via win-alt shall be helpful there
- The windows and lights need to be separated from the model
- The base truck should not have a carry department and canvas
- How to add an existing gun as prefab to make it a gun truck
- How to alter the animations so the driver works better in the M35

Model Work

In this text the model has already been altered to support Arma Reforger to some extent. On the changes I currently recall:

1. The geometry mesh has been renamed to the Arma Reforger Colliders naming syntax, see https://community.bistudio.com/wiki/Arma_Reforger:Vehicle_Creation#Checking_colliders_26_materials

2. The skeleton from the sample car was imported and a third axle was added
3. Most of the vertex groups in Blender were removed from LOD 0

That's all folks.