The Road Less Traveled – Integrating VISSIM Traffic Data into 3ds Max with Civil View

Steve Johnson

Design Visualization Lead – WSP

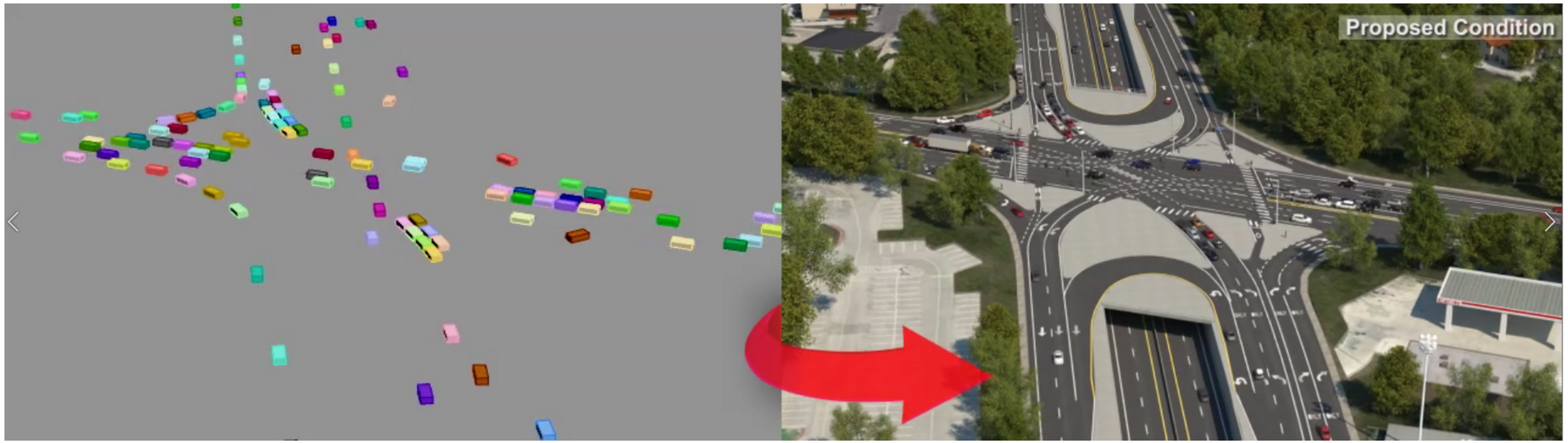
CES323212

AUTODESK. UNIVERSITY

Why VISSIM for Design Visualization

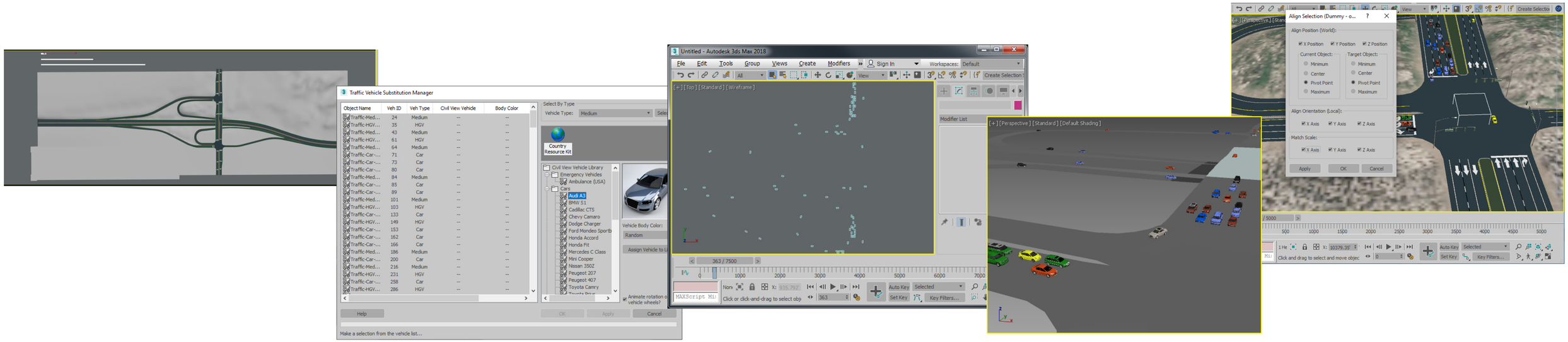
Working with traffic engineers, it's relatively simple to create and integrate highly accurate and photorealistic vehicle and traffic animations

- Easy to add large numbers of vehicles automatically to a scene
- Realistically moving traffic based on real-world variables
- Easily update for different roadway scenarios, time of day, future estimated conditions
- Ability to use 3ds Max's rendering capabilities



Basic Procedure Overview

- FZP file generated from VISSIM with proper parameters set
- Import FZP file into 3ds Max via Civil View plugin
- XRef roadway surfaces scene into scene with imported vehicles
- Align roadway to VISSIM boxes via translate/rotate/scale as needed
- Track vehicles to roadway surface using the Surface Tracking Manager
- Replace VISSIM boxes with high-res 3ds Max geometry with the Object Replacement Manager
- XRef vehicle file back into primary rendering scene using reverse transforms from roadway XRef
- Create custom library objects for different renderers or different vehicles



VISSIM FZP file export

- Civil View plugin reads specific parameters from VISSIM that need to be present in FZP file
- Depending on VISSIM version (up to v5.4 and after v6.0) variables are different

Preparing FZP Files in Vissim

SHARE

Importing traffic data from an FZP file can take less time if you export only the necessary Vissim vehicle attributes to begin with.

This table shows the vehicle attributes to export from Vissim. Additional vehicle attributes can be present in the FZP file, but they serve no purpose in Civil View and increase the file size, increasing import time.

Files generated from Vissim 5.4 and earlier

Vissim Attribute Short Name	Description	Comments
t	Simulation Time [s]	Required
VehNr	Number of Vehicle	Required
Type	Number of the Vehicle Type	Either the "Type" or the "VehTypeName" attribute must be present.
VehTypeName	Name of the Vehicle Type	Either the "Type" or the "VehTypeName" attribute must be present.
WorldX	World coordinate X (vehicle front end at the end of the simulation step)	Required
WorldY	World coordinate Y (vehicle front end at the end of the simulation step)	Required
WorldZ	World coordinate Z (vehicle front end at the end of the simulation step)	Required
RWorldX	World coordinate X (vehicle rear end at the end of the time step)	Required
RWorldY	World coordinate Y (vehicle rear end at the end of the time step)	Required
RWorldZ	World coordinate Z (vehicle rear end at the end of the time step)	Required

Files generated from Vissim 6.0 and later

Vissim Attribute Short Name	Description	Comments
SIMSEC	Simulation Time [s]	Required
NO	Number of Vehicle	Required
VEHTYPE\NAME	Name of the Vehicle Type (indirect attribute)	Recommended. Either the "VEHTYPE\NAME", "VEHTYPE\NO" or "VEHTYPE" attribute must be present.
VEHTYPE\NO	Number of the Vehicle Type (indirect attribute)	Either the "VEHTYPE\NAME", "VEHTYPE\NO" or "VEHTYPE" attribute must be present.
VEHTYPE	Number of the Vehicle Type (direct attribute)	Either the "VEHTYPE\NAME", "VEHTYPE\NO" or "VEHTYPE" attribute must be present.
COORDFRONT	World coordinate XYZ (vehicle front end at the end of the simulation step)	Required
COORDREAR	World coordinate XYZ (vehicle rear end at the end of the time step)	Required

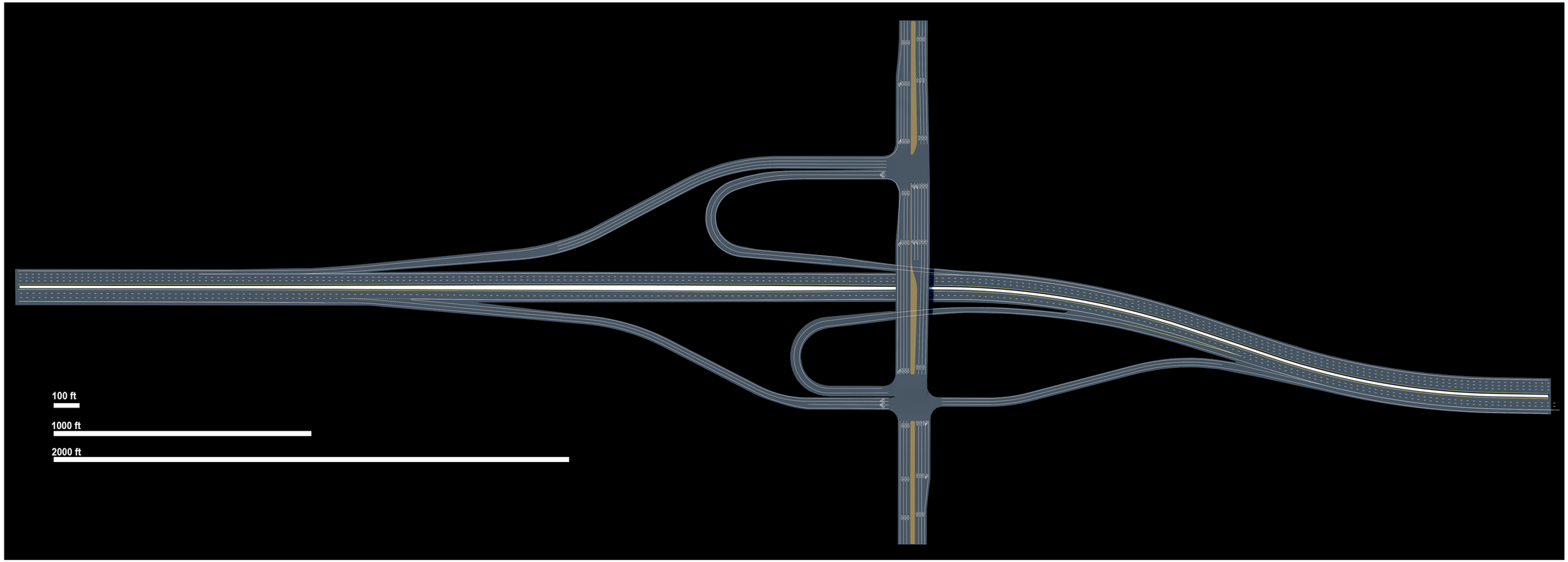
Note: Requirements to export from Vissim 6.0 and later:

- Do not apply the Show Units option to export attributes.
- Apply the default formatting option to export attributes.

Parent topic: Traffic Import Panels

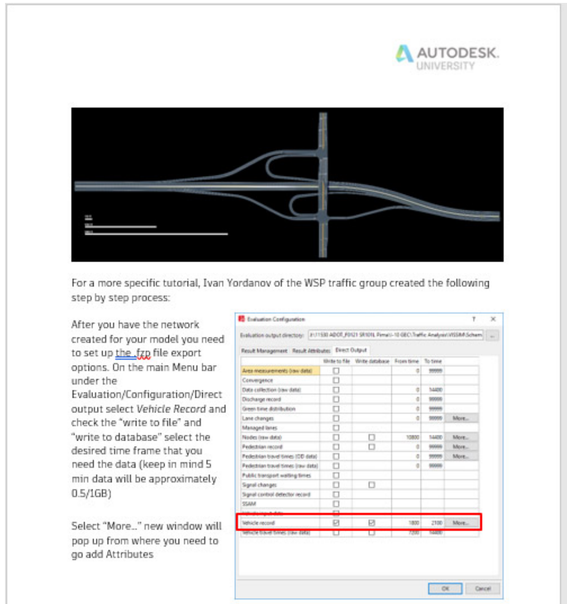
VISSIM FZP file export

- Biggest challenge will be to get VISSIM vehicles to line up with 3ds Max model
- Generally takes a few rounds of back and forth
- Ideally traffic data locked in first or 3D model locked in first (but this is the real world, like that ever happens ☺)
- Generate high-resolution plan view render with scale for traffic engineer to create paths for vehicles



VISSIM FZP file export

- For additional steps, see class handout

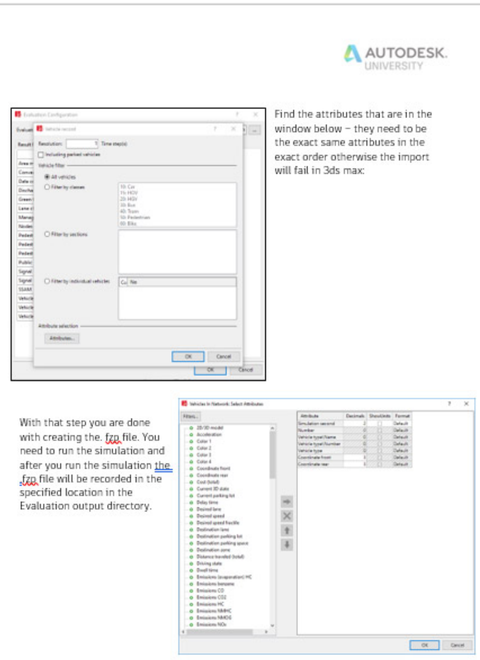


AUTODESK. UNIVERSITY

For a more specific tutorial, Ivan Yordanov of the WSP traffic group created the following step by step process:

After you have the network created for your model you need to set up the .fzp file export options. On the main Menu bar under the Evaluation/Configuration/Direct output select *Vehicle Record* and check the "write to file" and "write to database" select the desired time frame that you need the data (keep in mind 5 min data will be approximately 0.5/1GB)

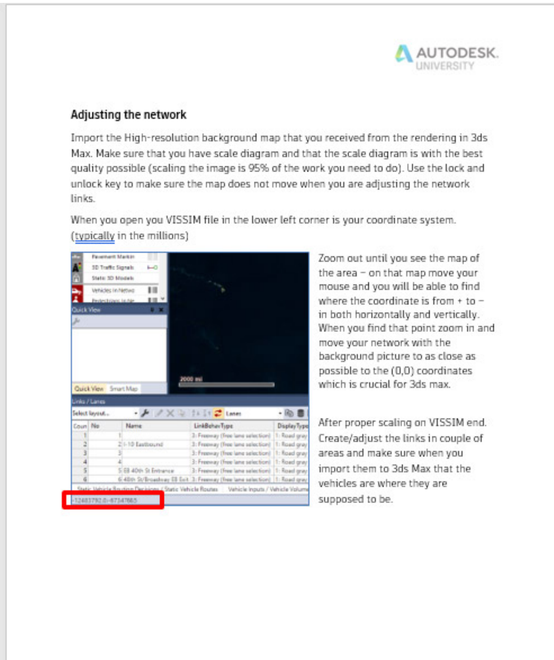
Select "More..." new window will pop up from where you need to go add Attributes



AUTODESK. UNIVERSITY

Find the attributes that are in the window below – they need to be the exact same attributes in the exact order otherwise the import will fail in 3ds max:

With that step you are done with creating the .fzp file. You need to run the simulation and after you run the simulation the .fzp file will be recorded in the specified location in the Evaluation output directory.



AUTODESK. UNIVERSITY

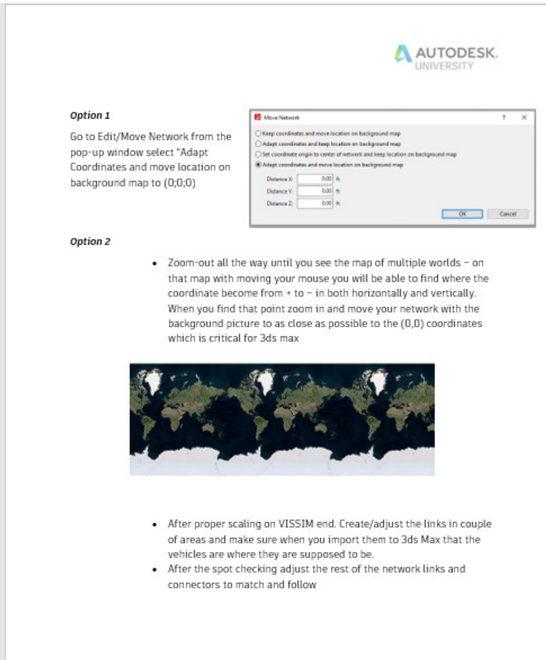
Adjusting the network

Import the High-resolution background map that you received from the rendering in 3ds Max. Make sure that you have scale diagram and that the scale diagram is with the best quality possible (scaling the image is 95% of the work you need to do). Use the lock and unlock key to make sure the map does not move when you are adjusting the network links.

When you open you VISSIM file in the lower left corner is your coordinate system. (typically in the millions)

Zoom out until you see the map of the area – on that map move your mouse and you will be able to find where the coordinate is from + to – in both horizontally and vertically. When you find that point zoom in and move your network with the background picture to as close as possible to the (0,0) coordinates which is crucial for 3ds max.

After proper scaling on VISSIM end. Create/adjust the links in couple of areas and make sure when you import them to 3ds Max that the vehicles are where they are supposed to be.



AUTODESK. UNIVERSITY

Option 1

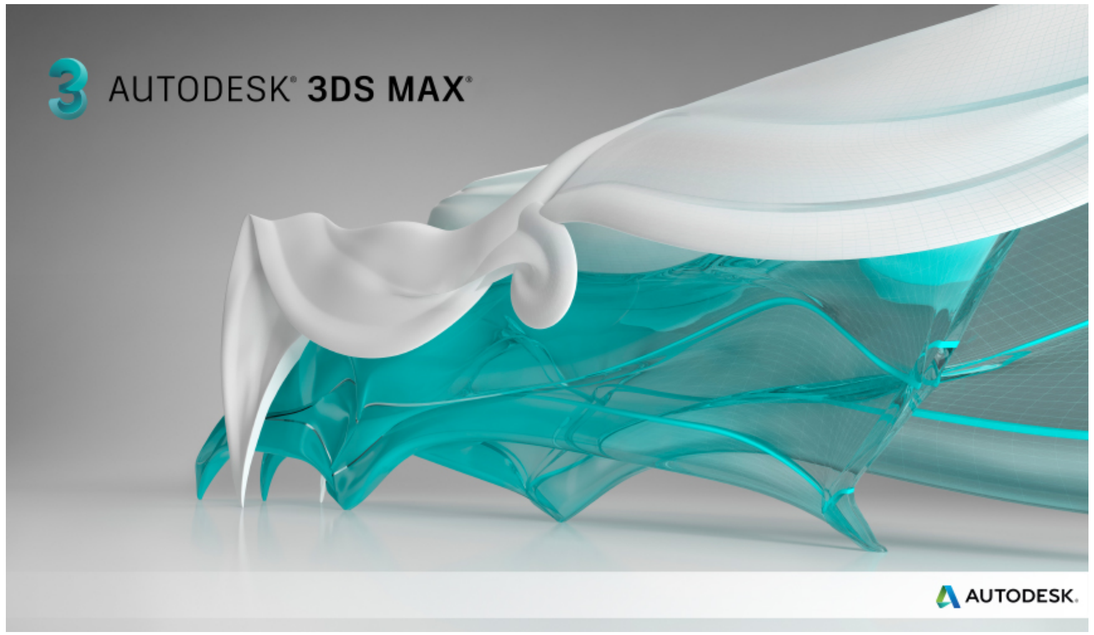
Go to Edit/Move Network from the pop-up window select "Adapt Coordinates and move location on background map to (0;0;0)

Option 2

- Zoom-out all the way until you see the map of multiple worlds – on that map with moving your mouse you will be able to find where the coordinate become from + to – in both horizontally and vertically. When you find that point zoom in and move your network with the background picture to as close as possible to the (0,0) coordinates which is critical for 3ds max

- After proper scaling on VISSIM end. Create/adjust the links in couple of areas and make sure when you import them to 3ds Max that the vehicles are where they are supposed to be.
- After the spot checking adjust the rest of the network links and connectors to match and follow

VISSIM → 3ds Max project demonstration



Questions?

- Take class survey in Autodesk University App

AUTODESK®

Make anything™

Autodesk and the Autodesk logo are registered trademarks or trademarks of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product and services offerings, and specifications and pricing at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document.

© 2019 Autodesk. All rights reserved.