CI2284 - Road Design Using Civil View in Autodesk® 3ds Max® Design on the Highway A4

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Lead Designer Roads
Class Summary

Find out how to use Autodesk 3ds Max Design software with the Civil View plug-in to create better and safer road designs. See some real-world examples of how design visualization is implemented as part of the Building Information Modeling (BIM) process during the first preliminary design. Learn not only how to create nice pictures, but also to see the impact of minor design changes to get a safer road design, including alignment characteristics, placement and visibility of road signs, sunlight analysis, reflections on sound screens, and so forth.
Learning Objectives

At the end of this class, you will be able to:

- Use the Civil View plug-in
- Explain how to improve road design
- Explain why visualization is possible in a very early design stage
- Describe the workflow in Autodesk® Infrastructure Design Suite
The Netherlands
So where’s the Netherlands?
Our neighbors
Our neighbors
Europe
The Netherlands

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>The Netherlands</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Sq. Miles</td>
<td>3,794,101</td>
<td>16,158</td>
<td>0.43 %</td>
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<tr>
<td>Population</td>
<td>310,673,000</td>
<td>16,626,900</td>
<td>5.35 %</td>
</tr>
<tr>
<td>Density P / Sq.M.</td>
<td>82</td>
<td>1030</td>
<td></td>
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</tbody>
</table>
The Netherlands
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The Netherlands
Relation to BIM
When to apply visualization?

- McLeamy Curve
What software
BIM Software Product exchange process

- Who makes which models?
- What tools do they use?
- What is their input and output?
Results

- About 20 different applications are being used
- Lean approach
- Introduced Tabled, Smartphone and ... A cool Smartboard
- Dedicated project server at project location
The project
Project overview (1)

- Missing link
- 60 years of struggling
- Numerous stakeholders
Project overview (2)

- 350mio Euro project
- Consortium between VolkerWessels, Heijmans and Boskalis
- Rotterdam area, The Netherlands
- Design Phase with approximately 200 people
- Summer 2013, Construction Phase approximately 800 people
Project Overview (3)
Communication

- Client
  - Design Sessions
- External parties, information centre
  - Visuals
Civil View
Project setup
Max scene setup

- Create base scene with centrelines, daylight and camera’s
- Reference all others
  - Scene lights
  - Road and earthworks
  - Civil constructions (bridges, tunnel, etc)
  - Surrounding area (houses, trees)
  - Gantry and signs
  - Road objects
  - Road lights
  - Guardrails
  - Noise Barriers
Setup coordinate template

- Import one object in 3ds Max using Civil View
- Now write these down
- Create a new scene, and set these coordinates
- Use this scene as a project template
Create your own signs

- From existing images
  - Print as an image (png/jpg) with pixels = sign dimensions

- From AutoCAD drawings

- Save image in C:\ProgramData\Autodesk\Civil View\[Country Kit name]\Matlibs\Signmaps

- Create ini file in C:\ProgramData\Autodesk\Civil View\[Country Kit name]\Objlibs\Signs

- Use the same name for image and ini file
Import

- Imports used from
  - Autodesk® Revit® Structure – Using Link or Solids dwg
  - AutoCAD® Civil 3D® - using .vsp3d file and Solids dwg
  - Bentley MX – using GENIO import
A rough sketch : Swept object
Swept Objects

- Creating a typical section
  - eg Walls and Bridge Decks
  - Save .sos files
Not only for final design...
... but during the design phase

- Not only useful for creating nice imagery
- Used for traffic camera analyses
  - What does each camera see?
- Used during design reviews with Road Safety Auditor
  - Sight distances
  - Placement of road signs, gantries
  - Overall experience from a drivers perspective
  - Tunnel safety analysis
- Helping in choosing the right design solution
Camera placement
Traffic Camera placements
Sight (Distance) Checker with road auditor
Camera Setup

- Set Camera properties
  - Offset from centreline
  - Eye height
  - Target distance
  - (speed when in animation)
Sign placement

- Signs ok?
Sign placement
Create images for decision makers
Sight Distance checker

- Overlay sight distance
Road sign positioning

- (Truck) eye height, Viaduct, Sign minimal readable distance
- Interference checks
Sight analysis vehicle placement

- Place car at sight distance
- Eye camera position
- Match speeds
Tunnel Exit

- See design changes
- Analyse each lane
- Barrier placements
Sight distance (driving, stopping sight)

- Watch the blue car disappear
Road markings alternatives
Road markings

- Alternative positioning
Exporting
Export model to …

- Export to NWC format
- Export to DWFx for review and online viewing
- Export to SketchFab (WebGL)
  - Example Bridge Deck [http://skfb.ly/li3hg1](http://skfb.ly/li3hg1)
- Animations, Drive through
Animations

- Render to images instead of movie format
  - Use centerline with 1m interval
  - Render each frame
  - Use Moviemaker, Virtual Dub, etc
  - Create in m/sec corresponding with desired speed
Sun Animation

- Set location, date and time
- Set frame start and frame end time
Finally
A4all classes

Wednesday

- 8:00 - CI2284 Road Design using Civil View
- 10:00 - CI2283 BIM Workflow on the Highway A4 Construction Project
- 15:00 - CI2281 Using Subassembly Composer
See more of this

- CI2283 - BIM Workflow on the Highway A4 Construction Project
  Shell Seekers A, North Lower Level, 10:00am – 11:30am
- New Civil Engineer – November 2012 issue
Questions?

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