Methodological Proposal of Creating 3D Terrain Models in Unreal Engine 4, to be Used in Surveys for Wind Farms Visual Assessments.

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Initial Investigation

By the middle the 21st century, the worldwide appetite for energy will go up by 50%, and in developing countries by 80% (World Energy Council, 2013)

This will lead to energy production either through traditional environmentally detrimental ways or through cleaner renewable ways.

Vertical Axis Wind Turbines (VAWT) and Horizontal Axis Wind Turbines (HAWT).

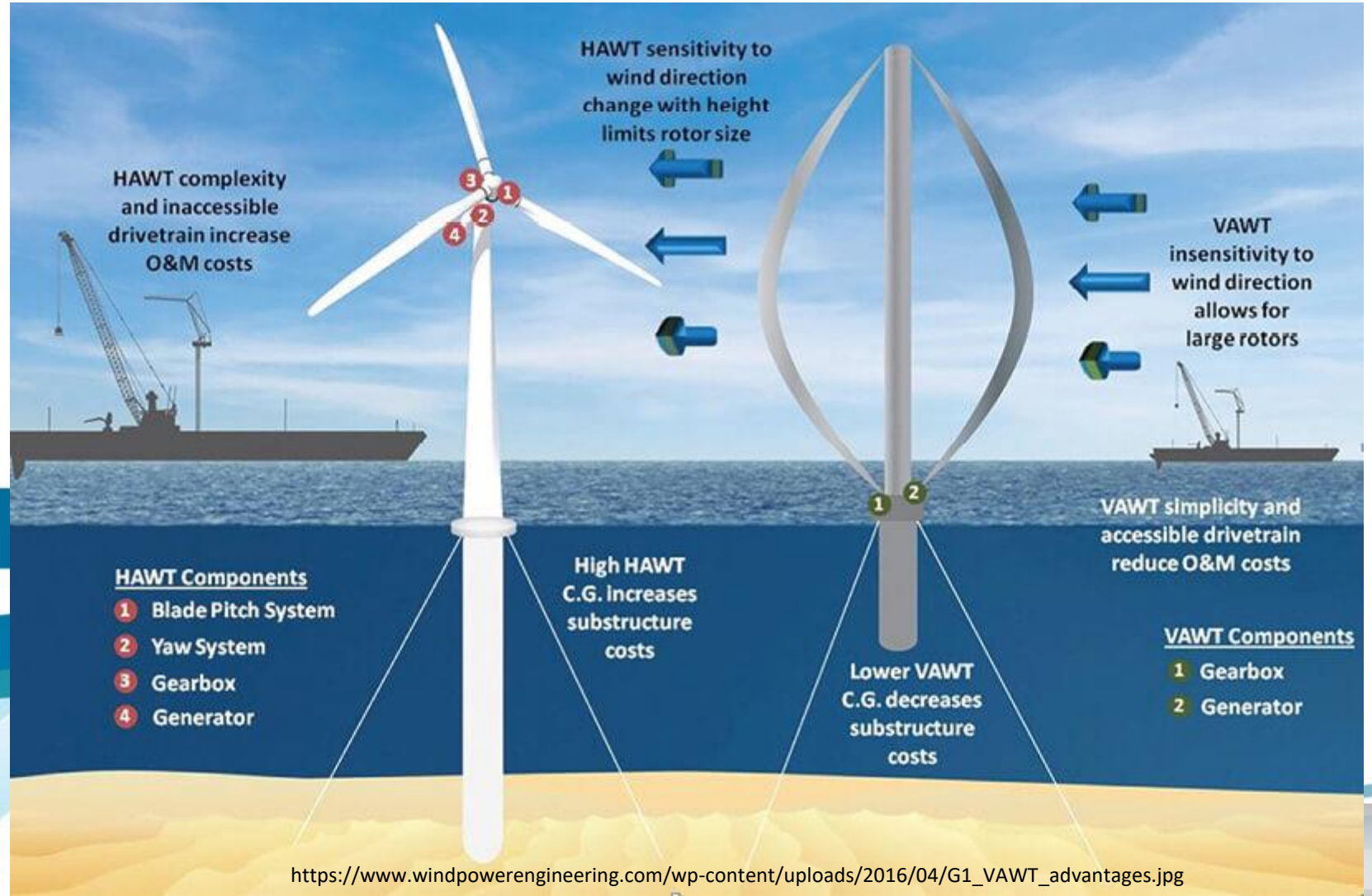
HAWT **VAWT**

Pros

Cons

Pros

Cons



https://www.windpowerengineering.com/wp-content/uploads/2016/04/G1_VAWT_advantages.jpg

Survey Responses To Turbines

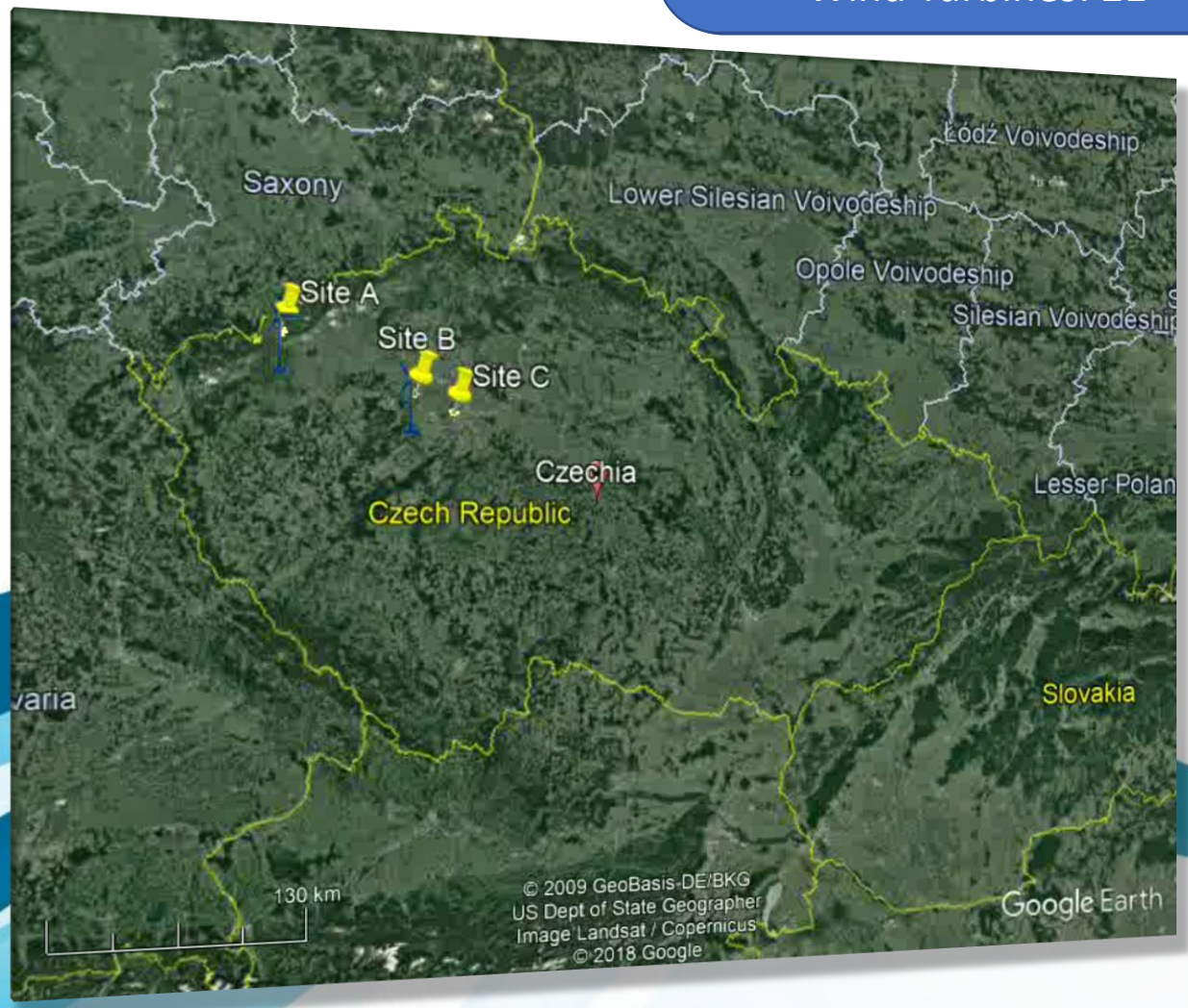
NIMBY - Not in my backyard

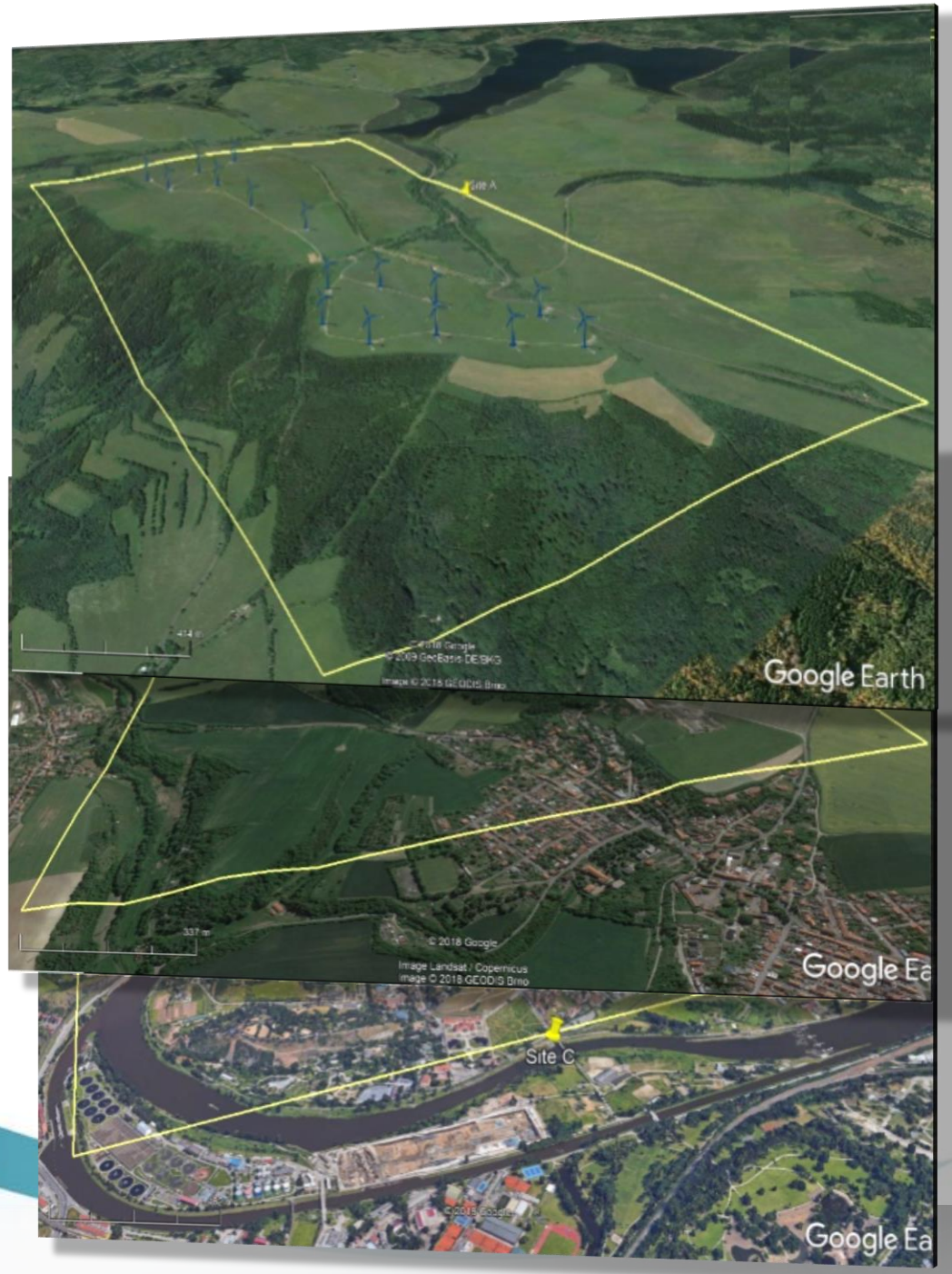
These surveys are important because they can go on to form public opinion and official government policies.

Most of the time the bias is probably unintentional, but regardless can still appear in body language, question phrasing, or how the pictures/cinematics are framed and made.

Site Location

Site A
Kryštofovy Hamry –
Přísečnice, Czech Republic
Elevation: 850 m (2788ft)
Average Windspeed: 4.5 m/s
Wind Turbines: 21





Failed Attempts: Sketchup

Benefit: Easy to import terrain data.
Low learning curve.
Creates 3D environment.

Negatives: Poor terrain resolution.
Max size to import is 2 km^2.

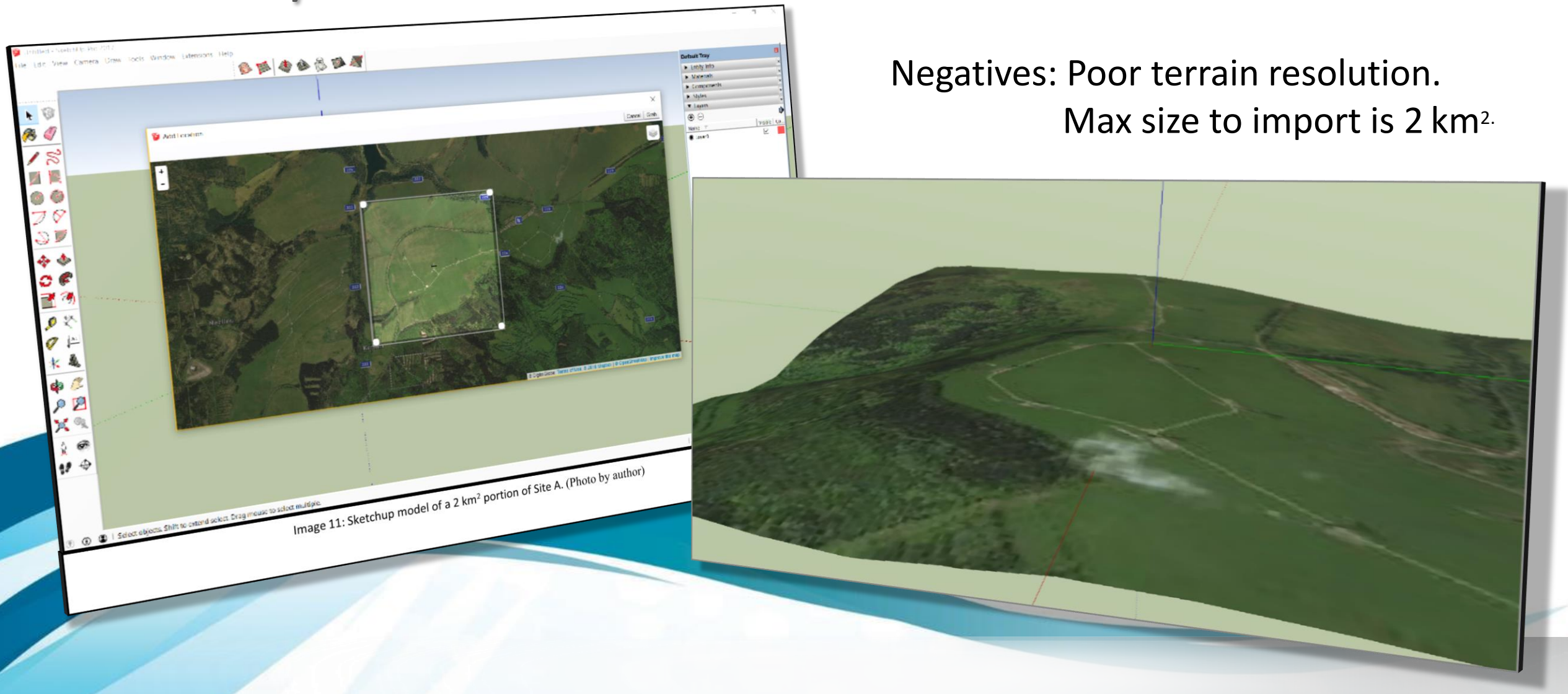
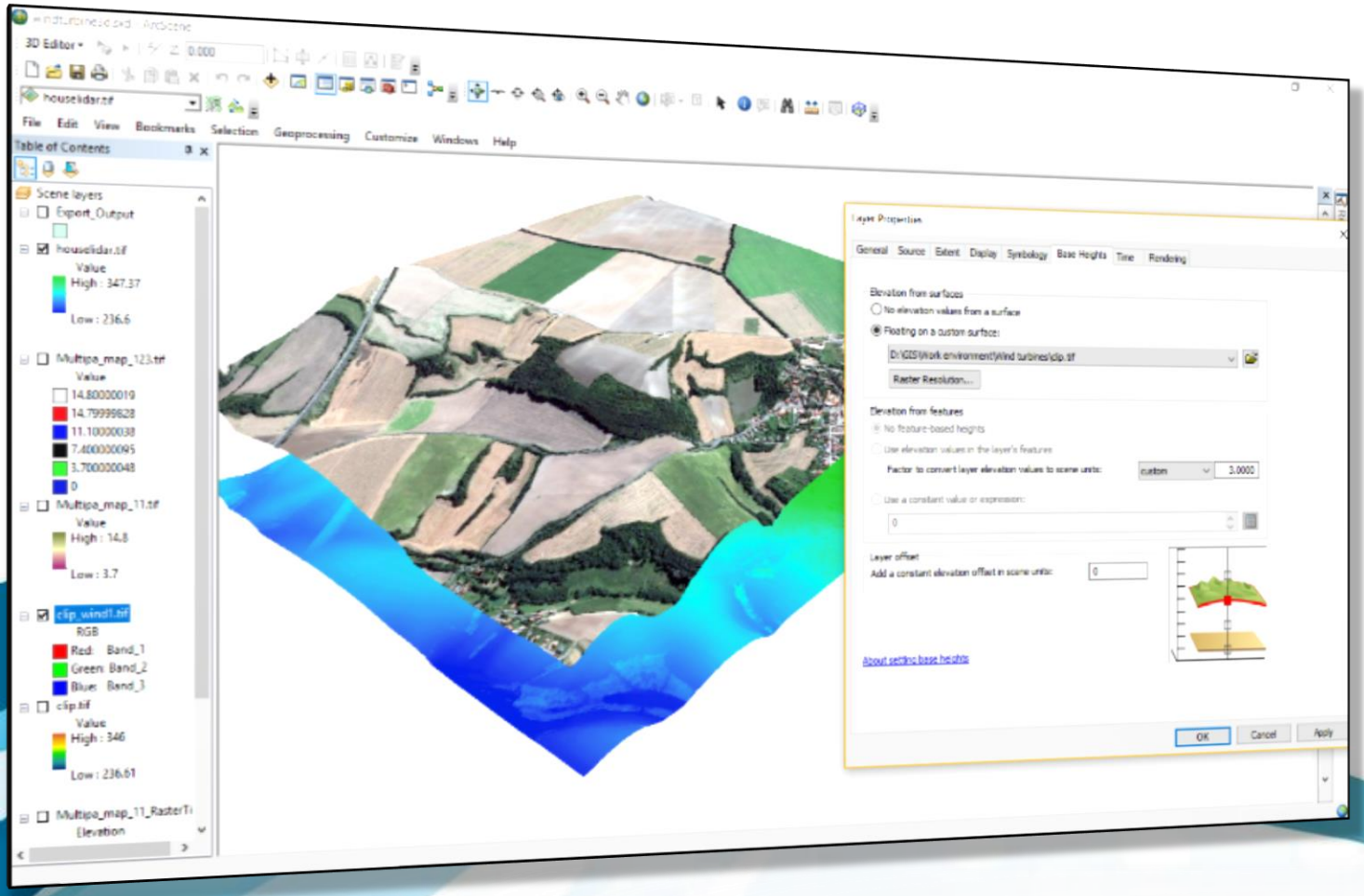


Image 11: Sketchup model of a 2 km^2 portion of Site A. (Photo by author)

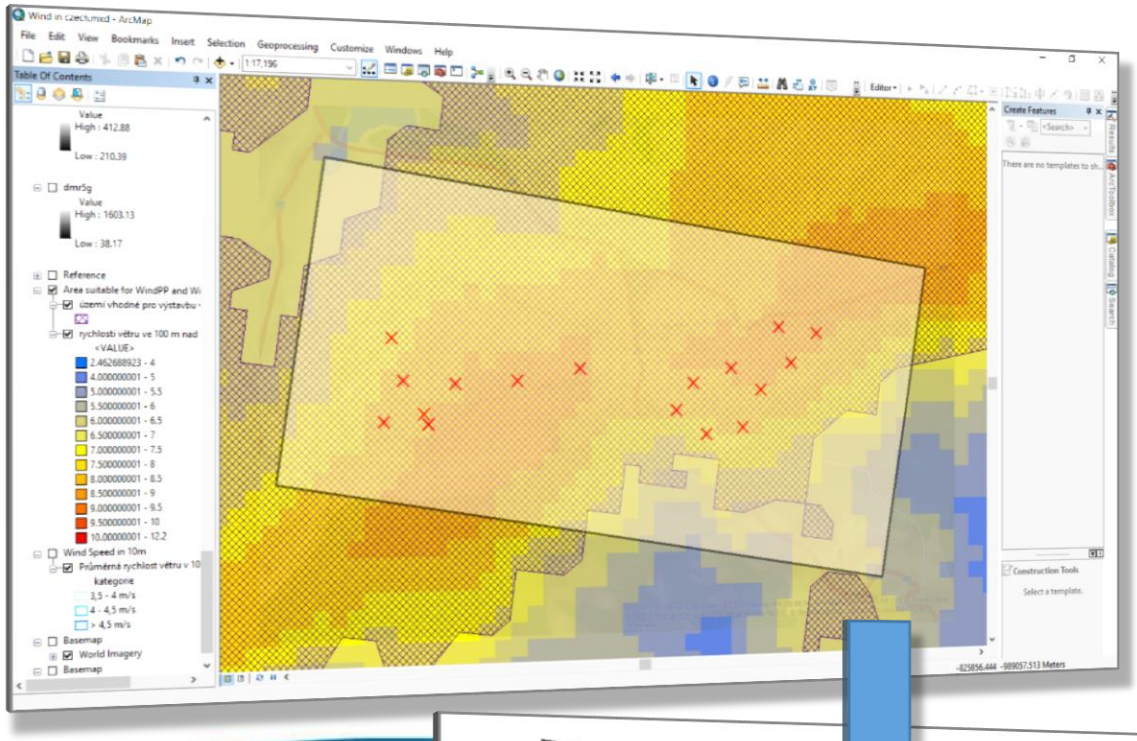
Failed Attempts: ArcScene

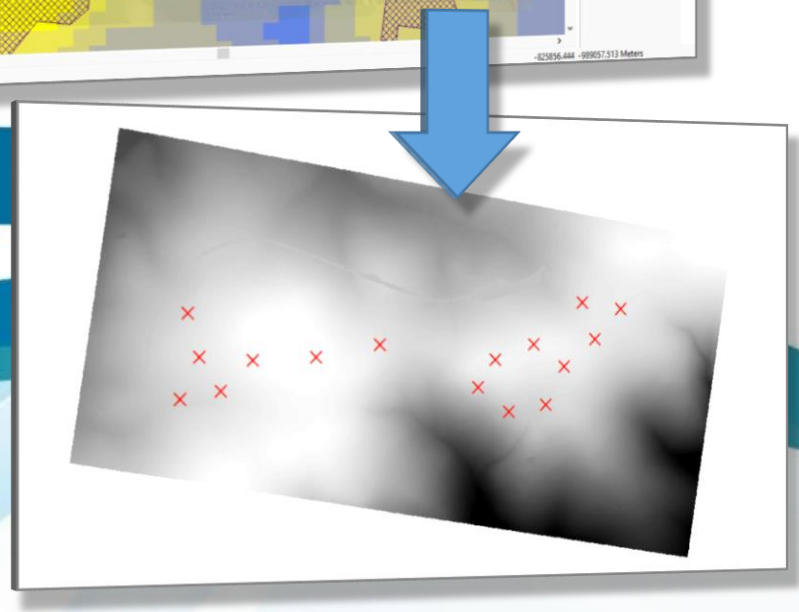
Benefit: Creates 3D environment.
High resolution map.

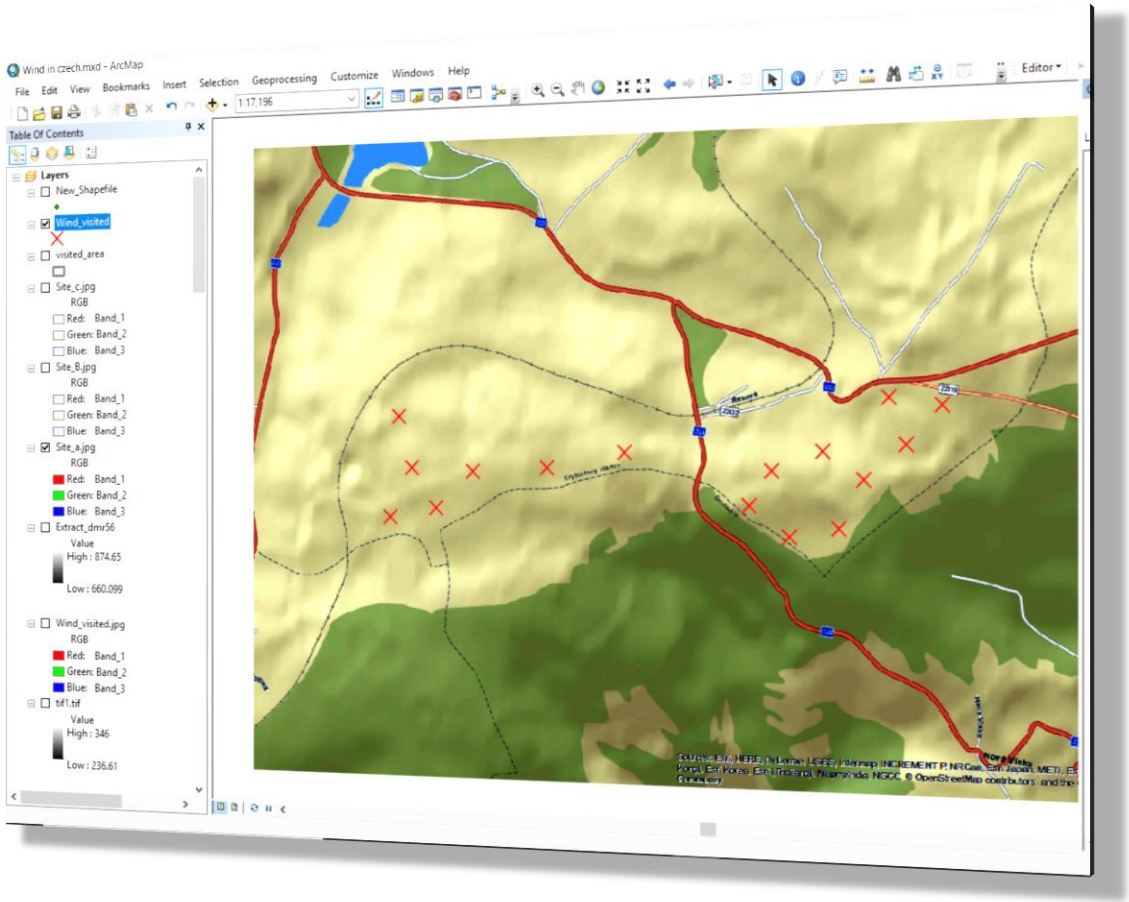
Negatives: Not easy to create for beginner.
Cannot move around environment.



Workflow of Project

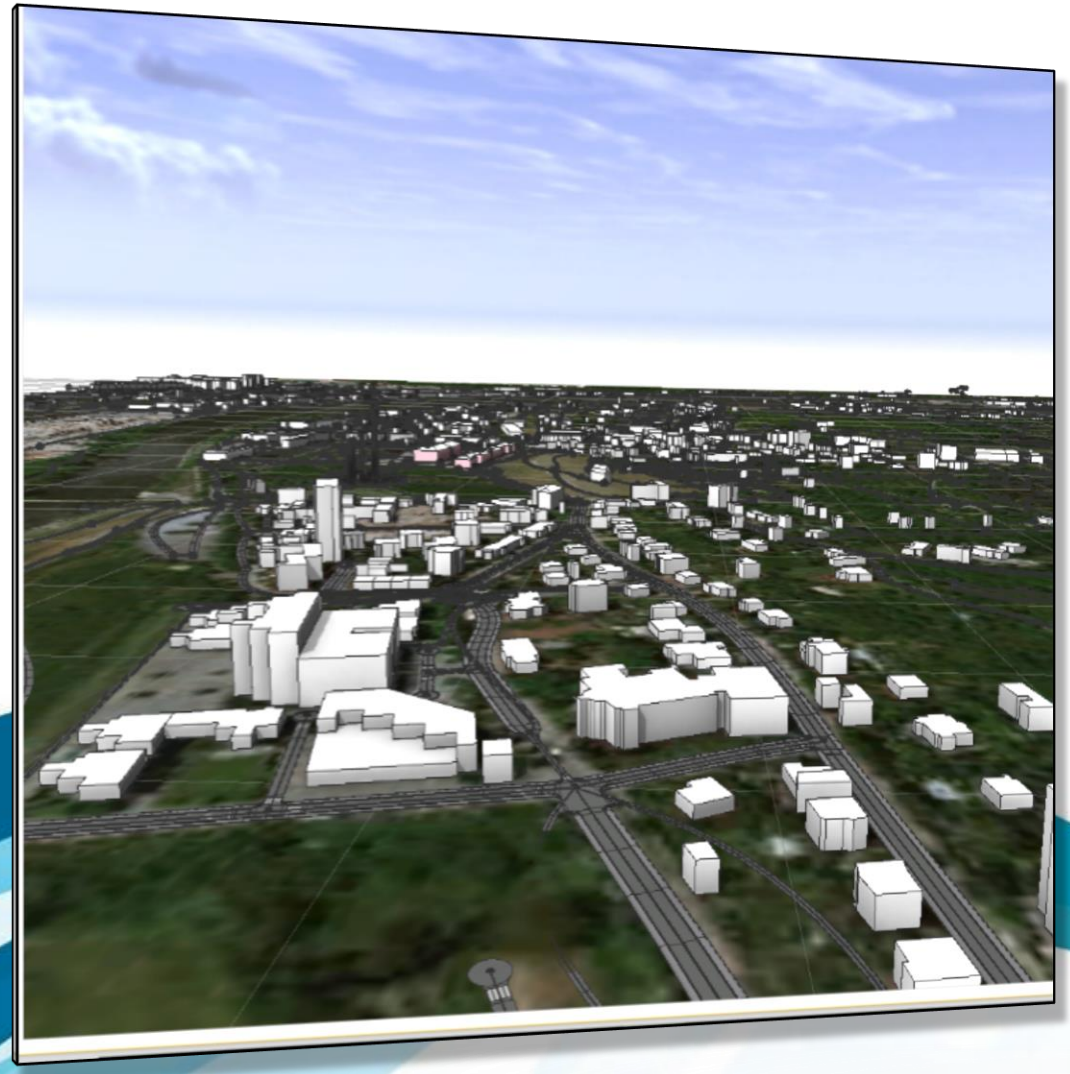






GIS >

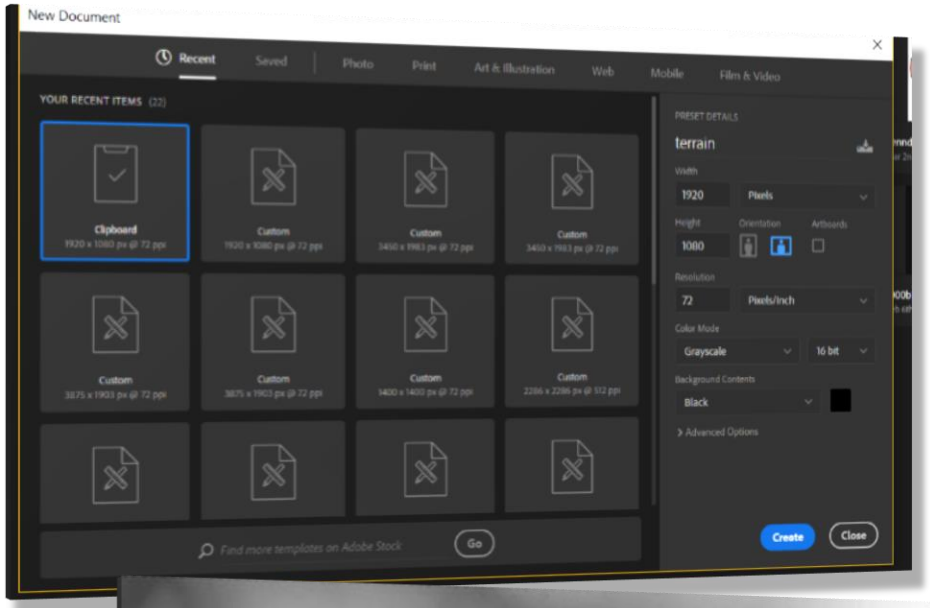
Workflow of Project



City Engine >

GIS >

Workflow of Project

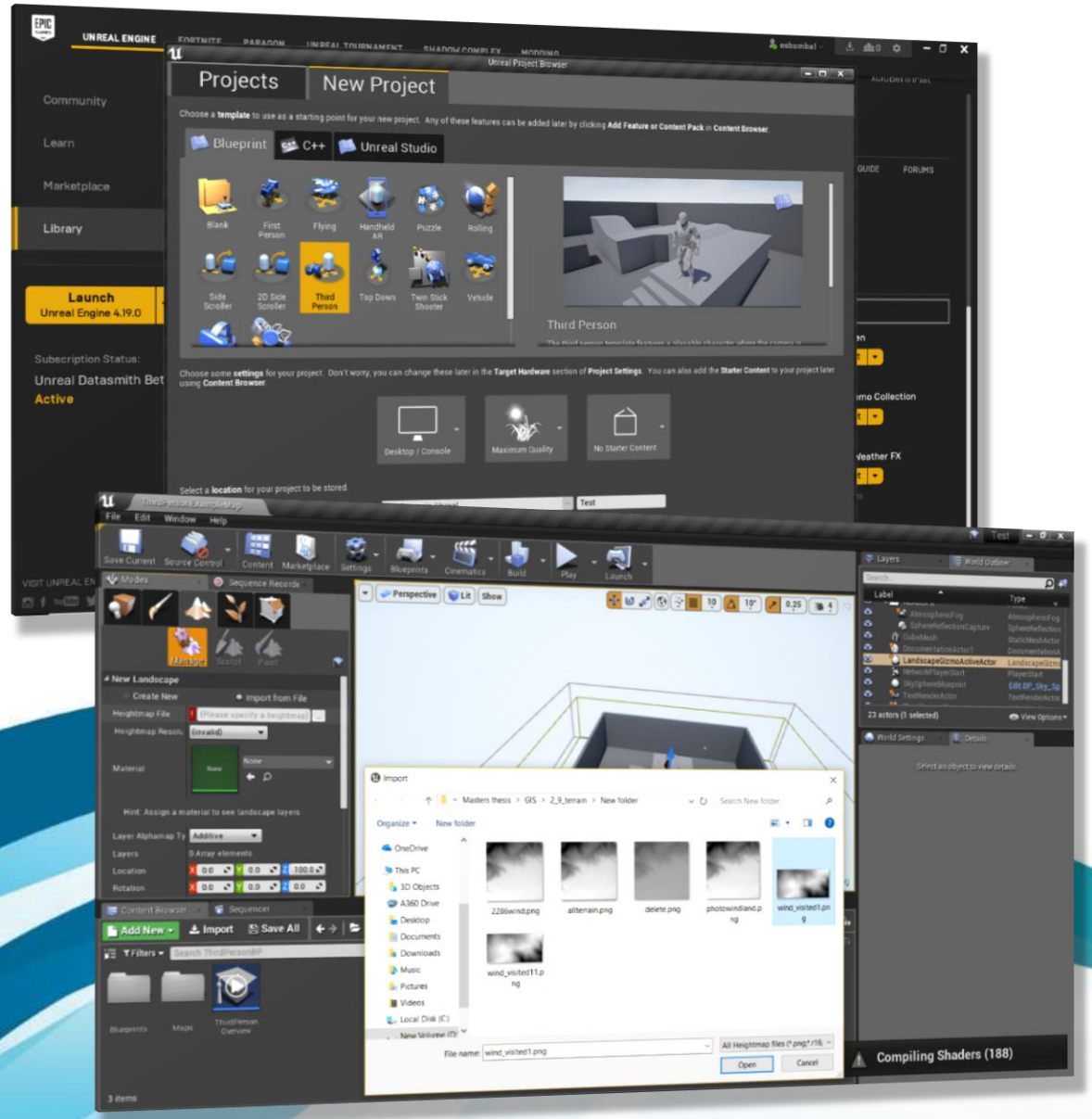


Photoshop >

City Engine >

GIS >

Workflow of Project



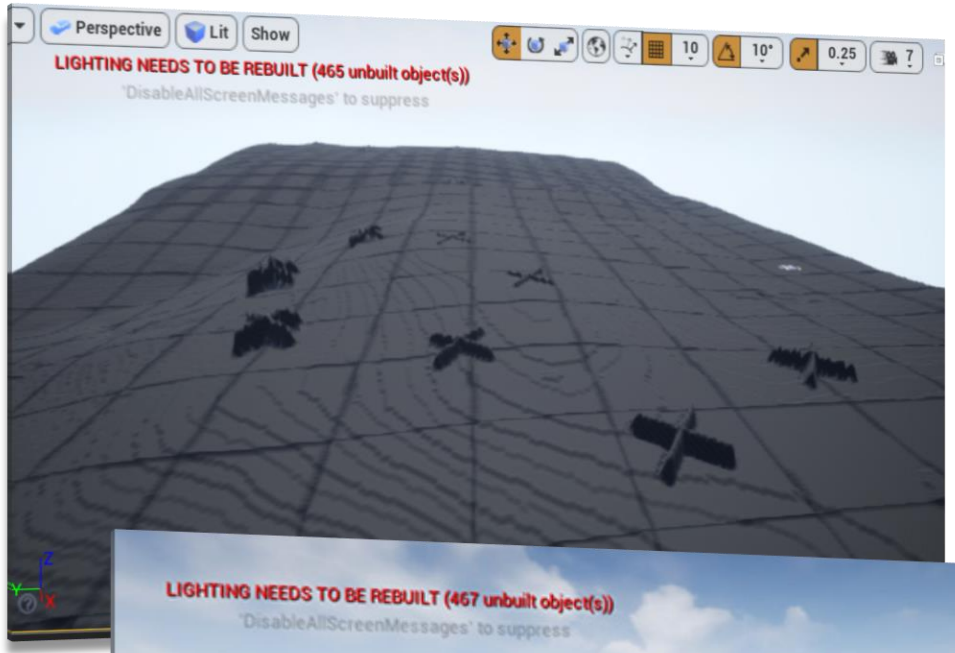
Unreal Engine >

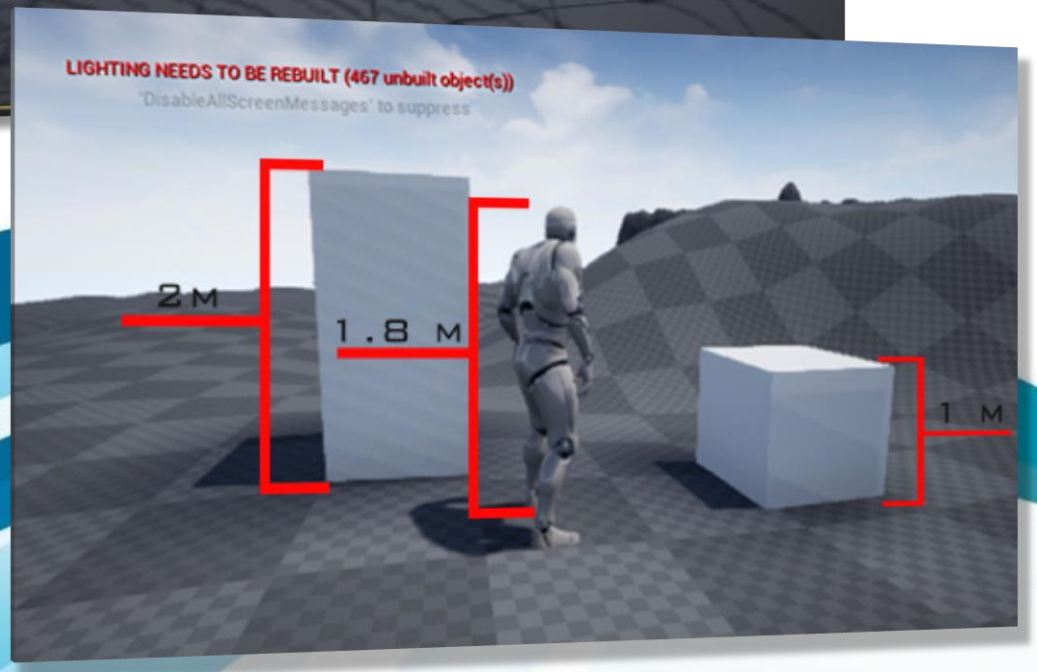
Photoshop >

City Engine >

GIS >

Workflow of Project





Unreal Engine >

Photoshop >

City Engine >

GIS >

Workflow of Project

Premiere>

Unreal Engine >

Photoshop >

City Engine >

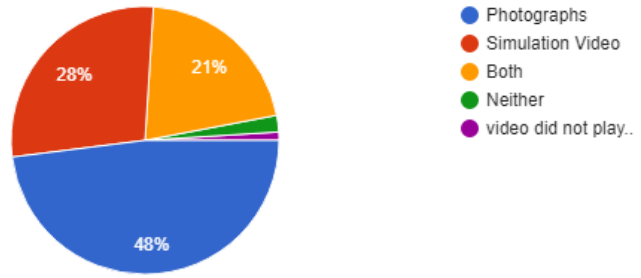
GIS >

Survey

1. In section 1, how realistic are the manipulated photos?
2. In section 1, how realistic did the simulation video appear?
3. Comparing the photograph and video in section 1, which did you prefer?
4. Comparing the photograph and video in section 1, which gave you more understanding of the area?
5. In section 2 of the video, how realistic did the simulation video appear?
6. In section 3 the video simulation had audio. How would you rate the effectiveness of the audio with video simulation, regarding immersion?
7. Overall, which media helps you to understand landscape more?
8. Which method would you prefer if one must be chosen?

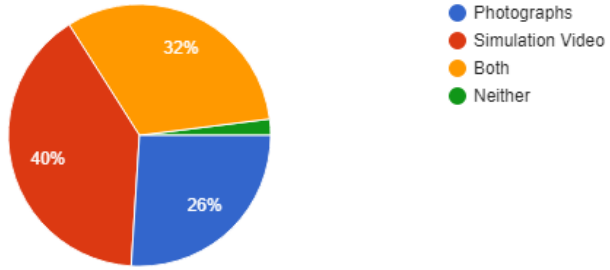
Comparing the photograph and video in section 1, which did you prefer?

100 responses



Comparing the photograph and video in section 1, which gave you more understanding of the area?

100 responses



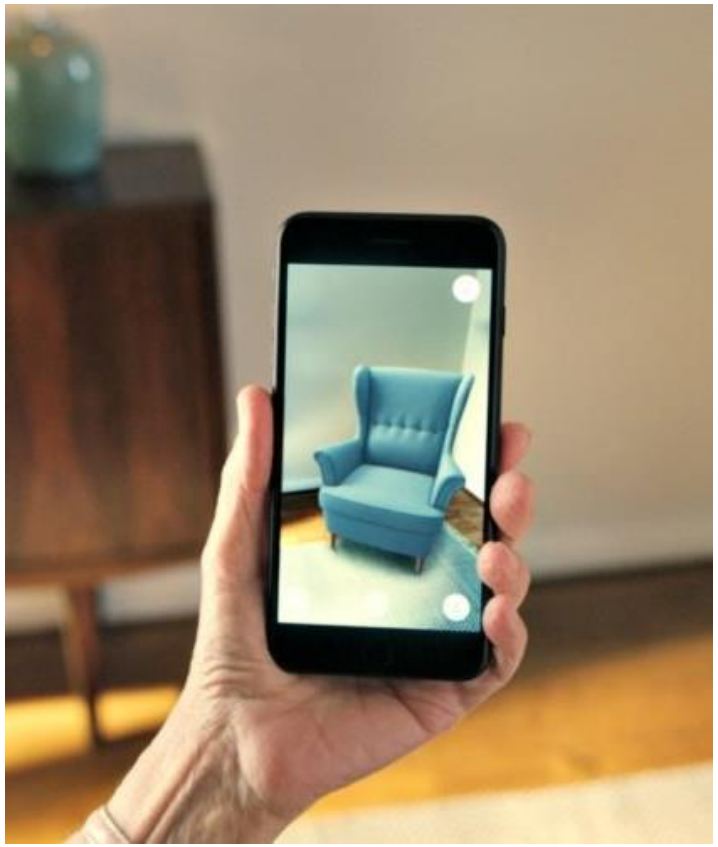
Real

Manipulated

Section 1

Original photo: Peter Kumble

Future Possibilities



Conclusion