

Open Streaming Terrain

For Modeling and Simulation

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Outline

The relationship between terrains and simulations

Terrain approaches

Simulation use cases

The use of standards

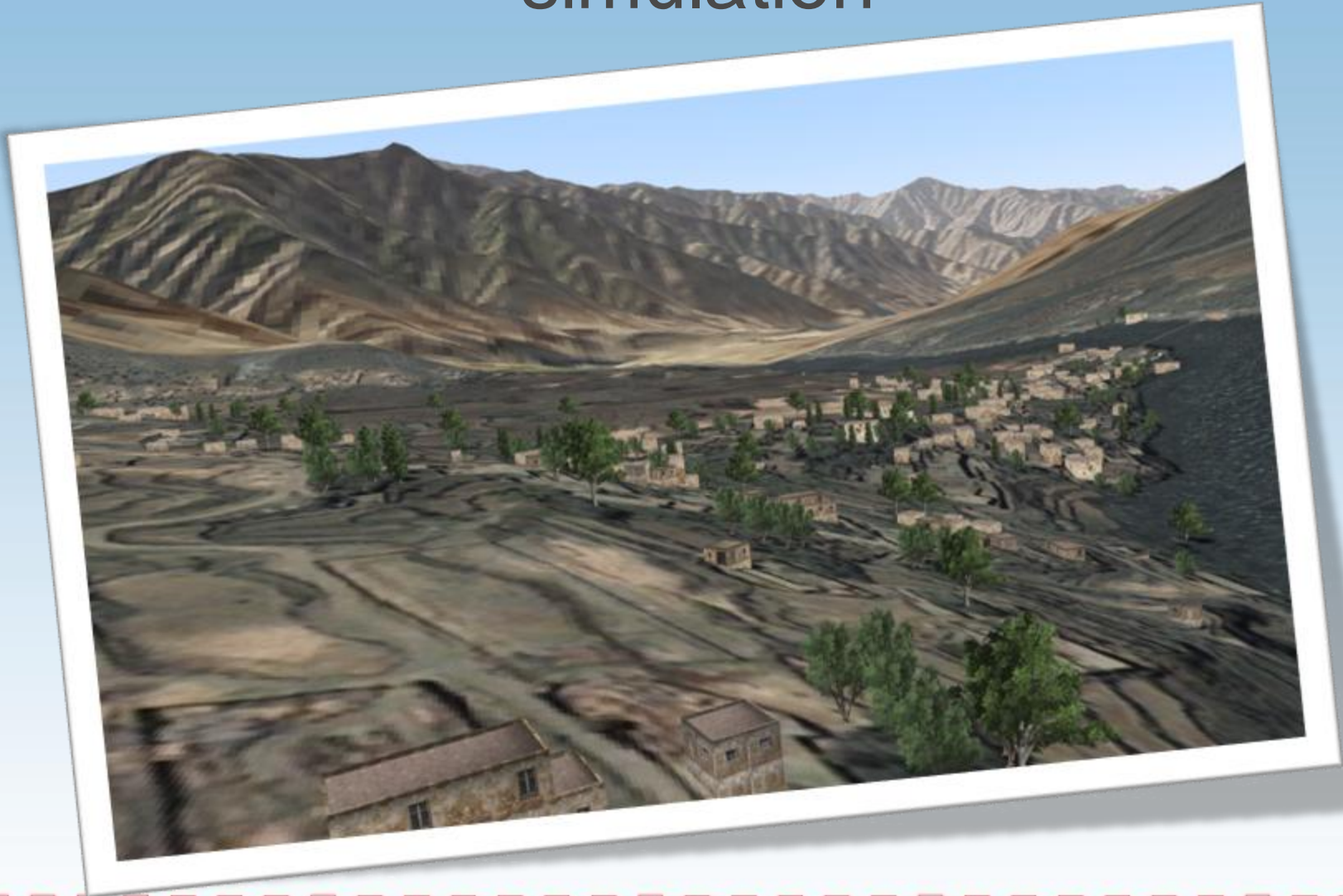
Open Streaming Terrain (OST)

Where OST is appropriate

The simulation dictates the terrain



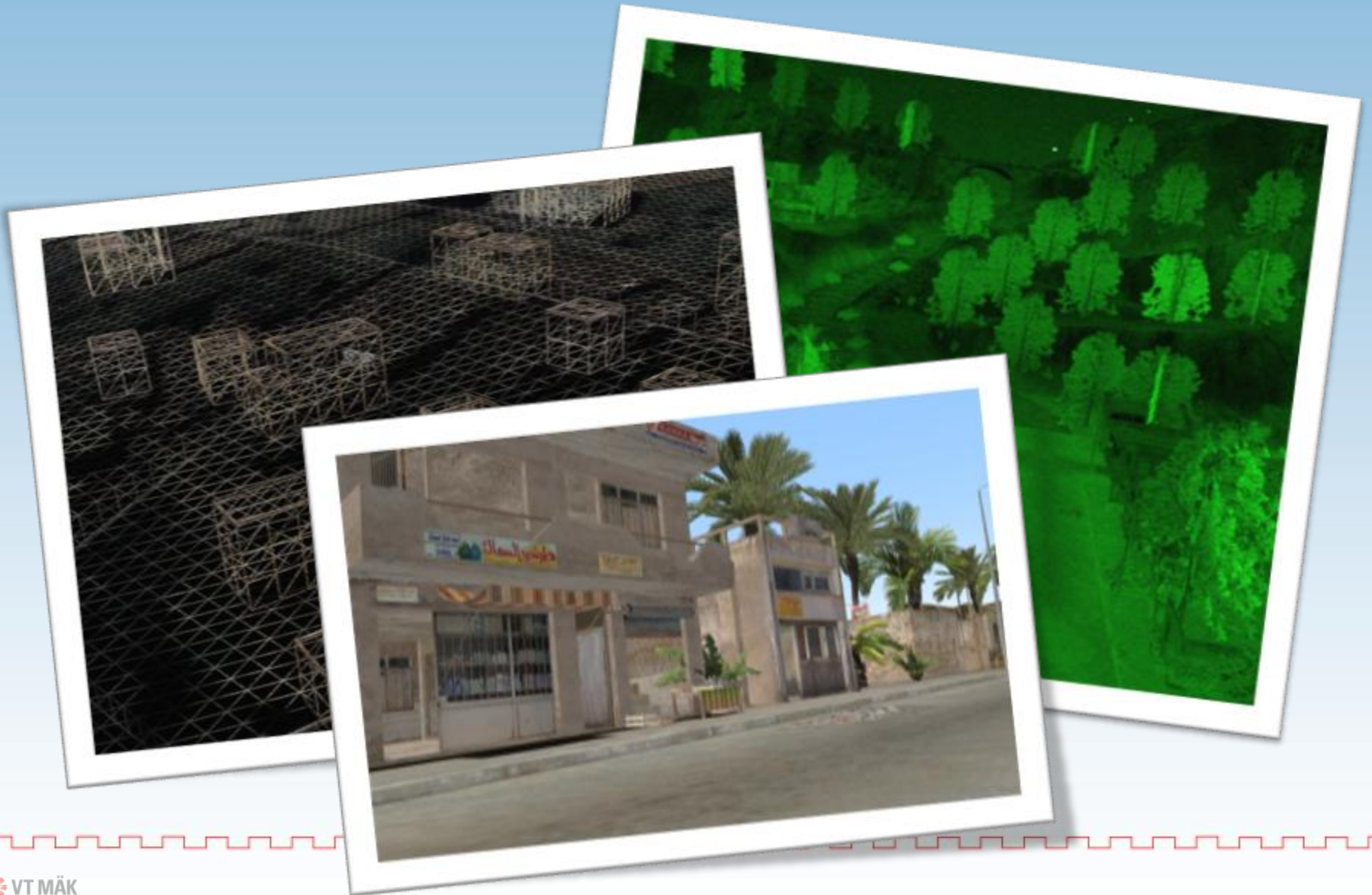
The terrain defines the fidelity of the simulation



Systems constrain the terrain



Systems constrain the terrain



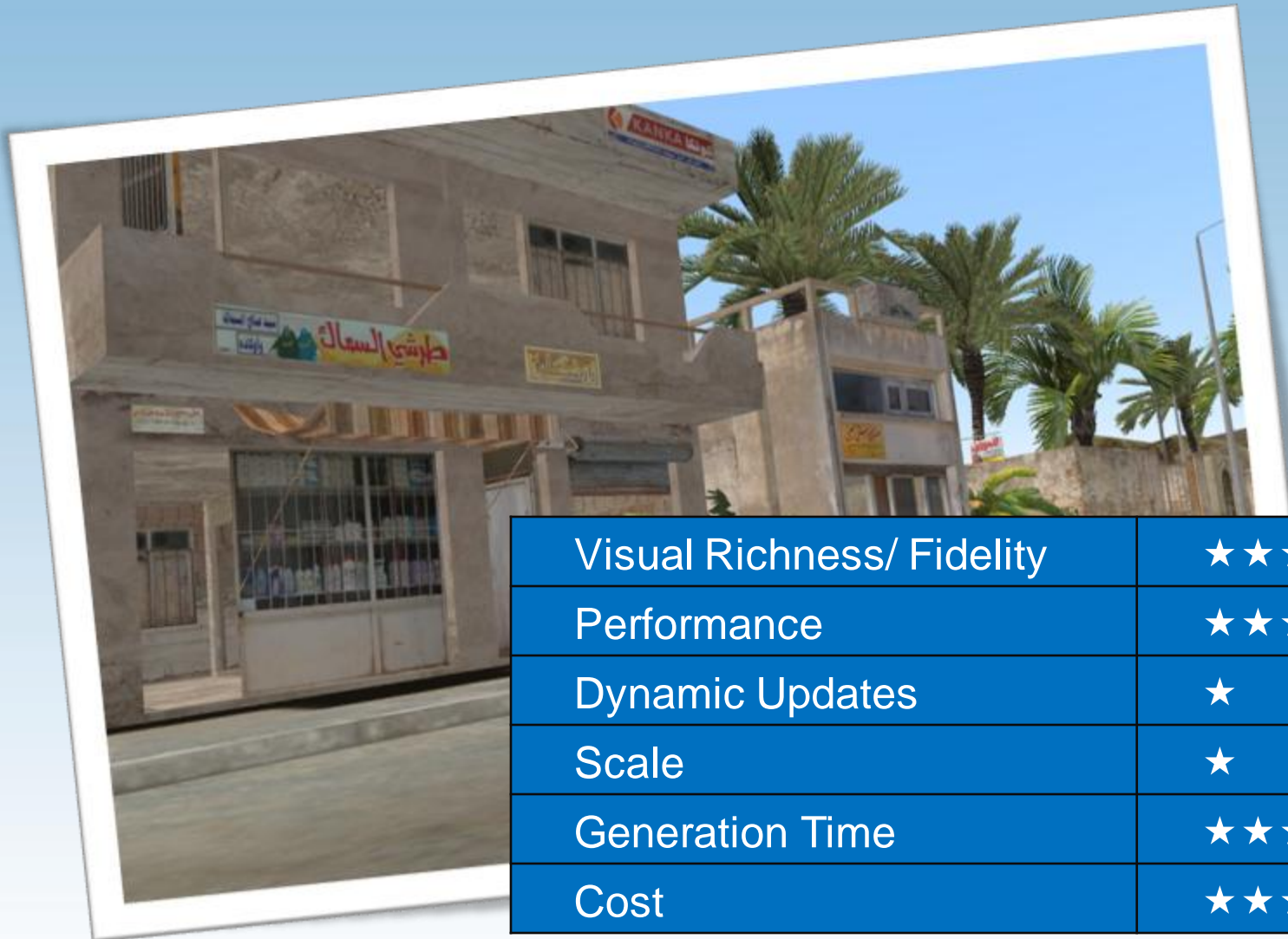
Terrain Approaches



Terrain Characteristics

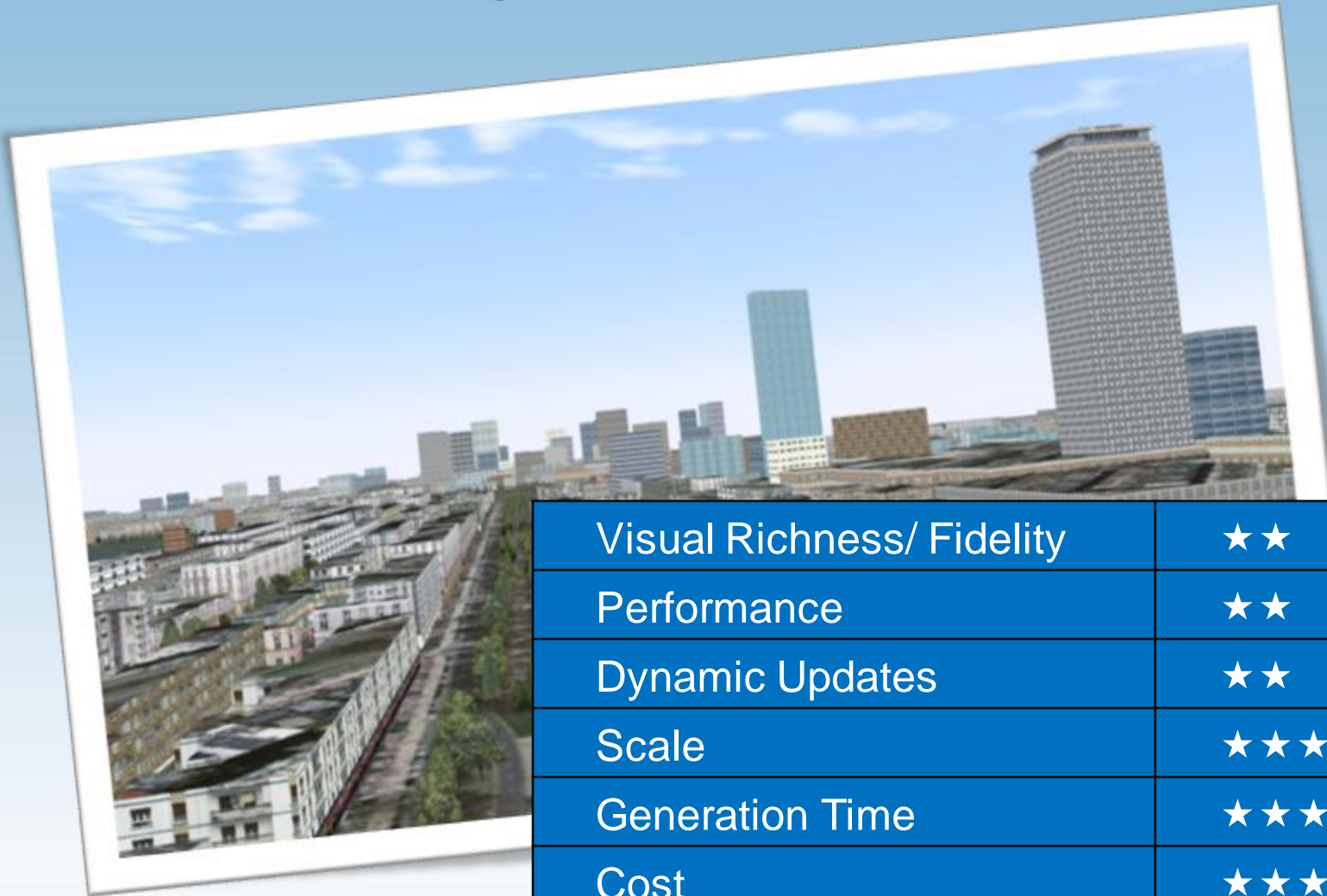
Visual Richness/ Fidelity	★★★★
Performance	★★★★
Dynamic Updates	★★★★
Scale	★
Generation Time	★★
Cost	★

Hand modeled terrains



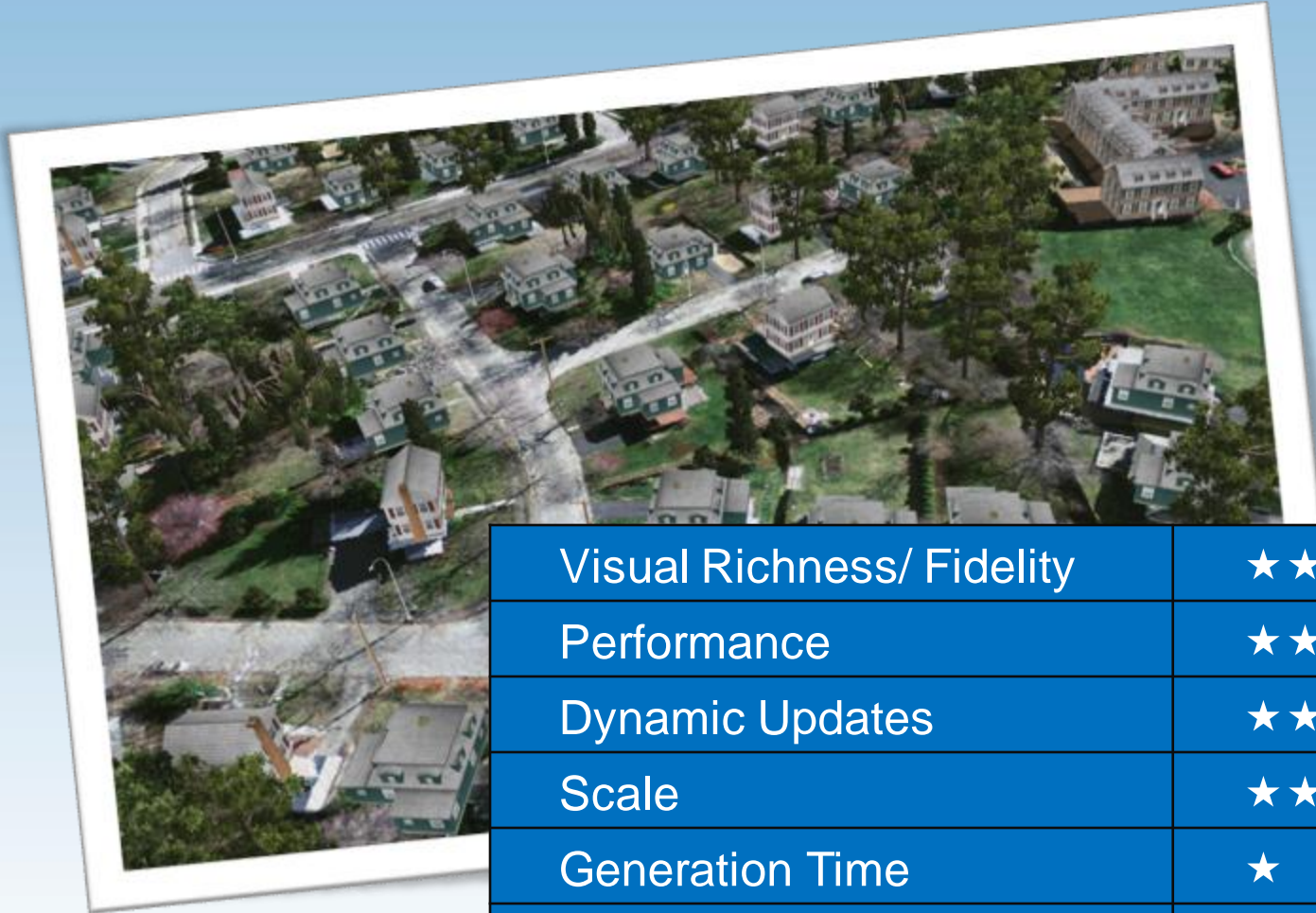
Visual Richness/ Fidelity	★★★★
Performance	★★★
Dynamic Updates	★
Scale	★
Generation Time	★★★★
Cost	★★★★

Tool generated terrains



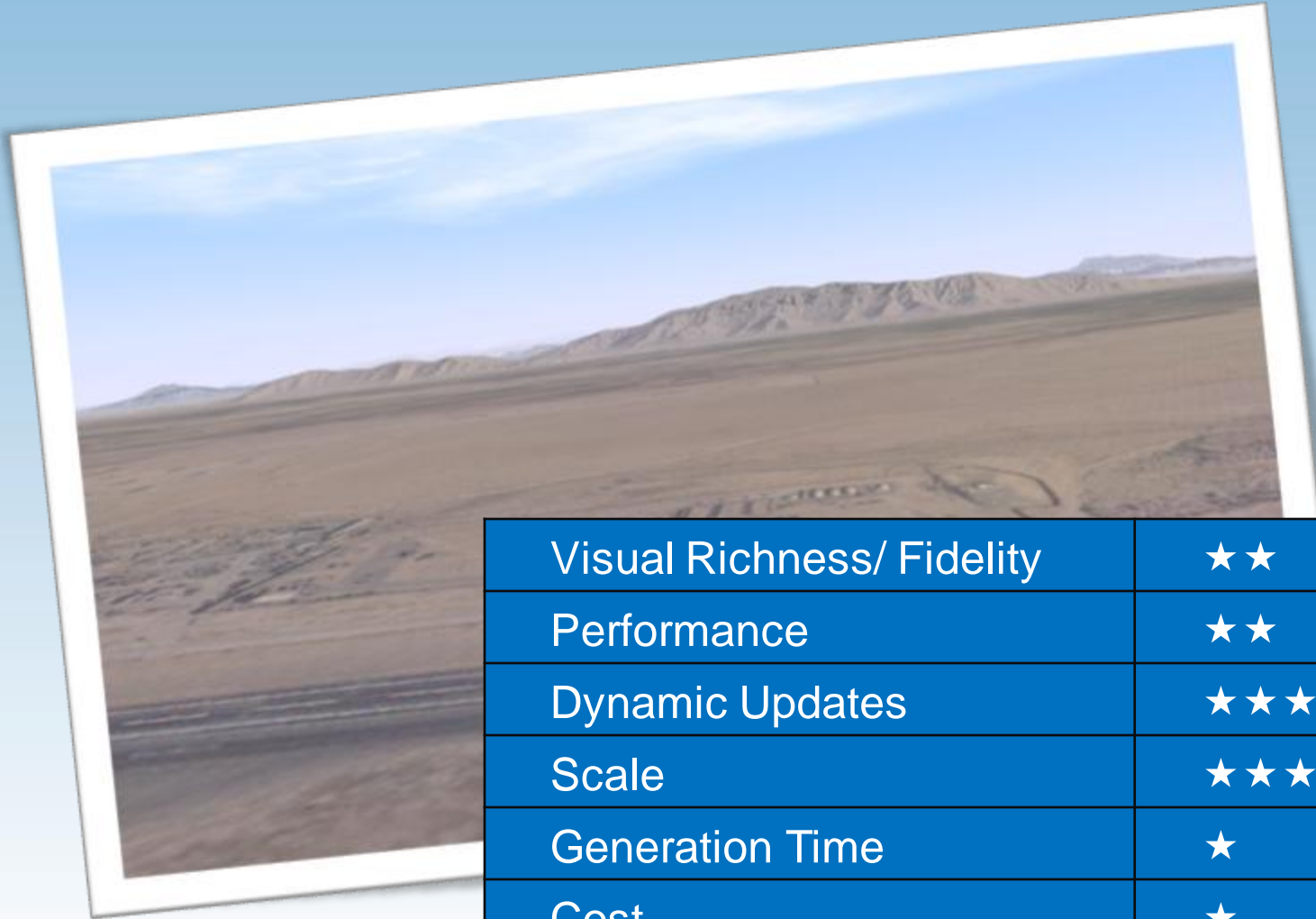
Visual Richness/ Fidelity	★★
Performance	★★
Dynamic Updates	★★
Scale	★★★★
Generation Time	★★★
Cost	★★★

Direct from source terrains



Visual Richness/ Fidelity	★ ★
Performance	★ ★
Dynamic Updates	★ ★
Scale	★ ★ ★
Generation Time	★
Cost	★

Streaming terrains



Visual Richness/ Fidelity	★ ★
Performance	★ ★
Dynamic Updates	★ ★ ★ ★
Scale	★ ★ ★ ★
Generation Time	★
Cost	★

Urban Simulations



Combined Arms Trainer



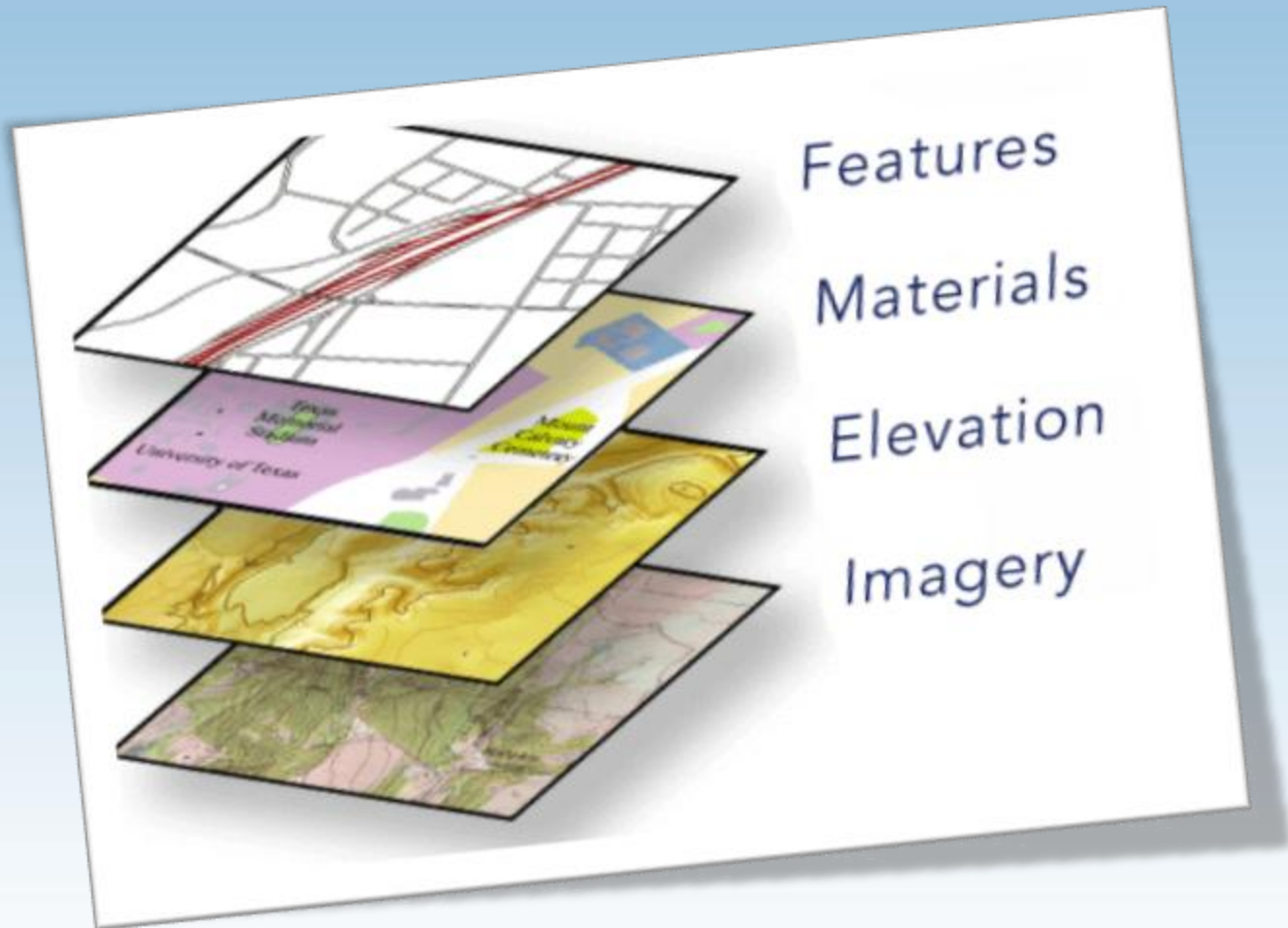
Target Acquisition Lab



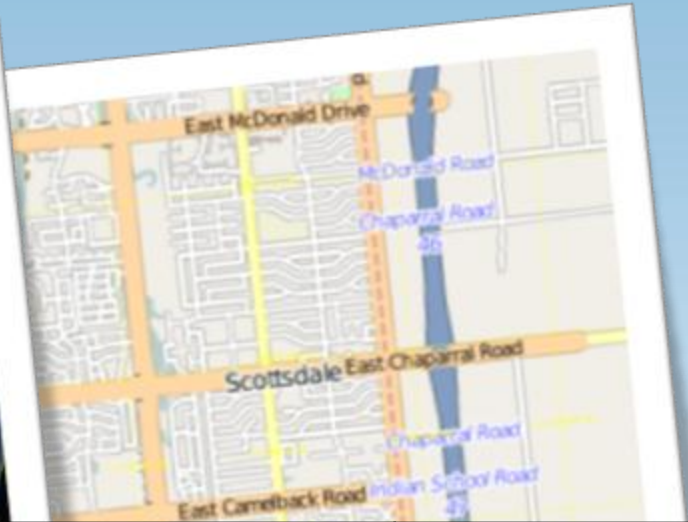
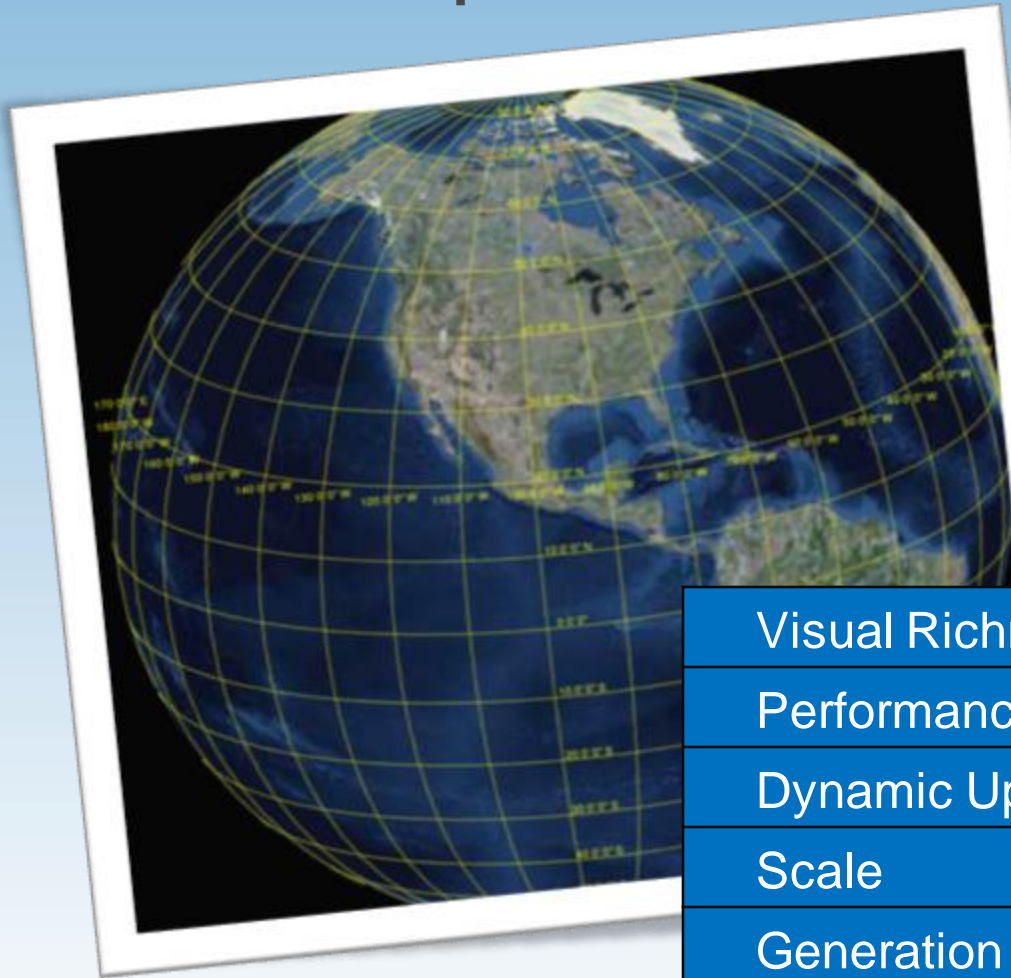
Flight Trainer



The Use of Standards



Open Streaming Terrains



Visual Richness/ Fidelity	★★
Performance	★★
Dynamic Updates	★★★★
Scale	★★★★
Generation Time	★
Cost	★

OGC and OSGeo Standards

OGC[®]

Making Location Count



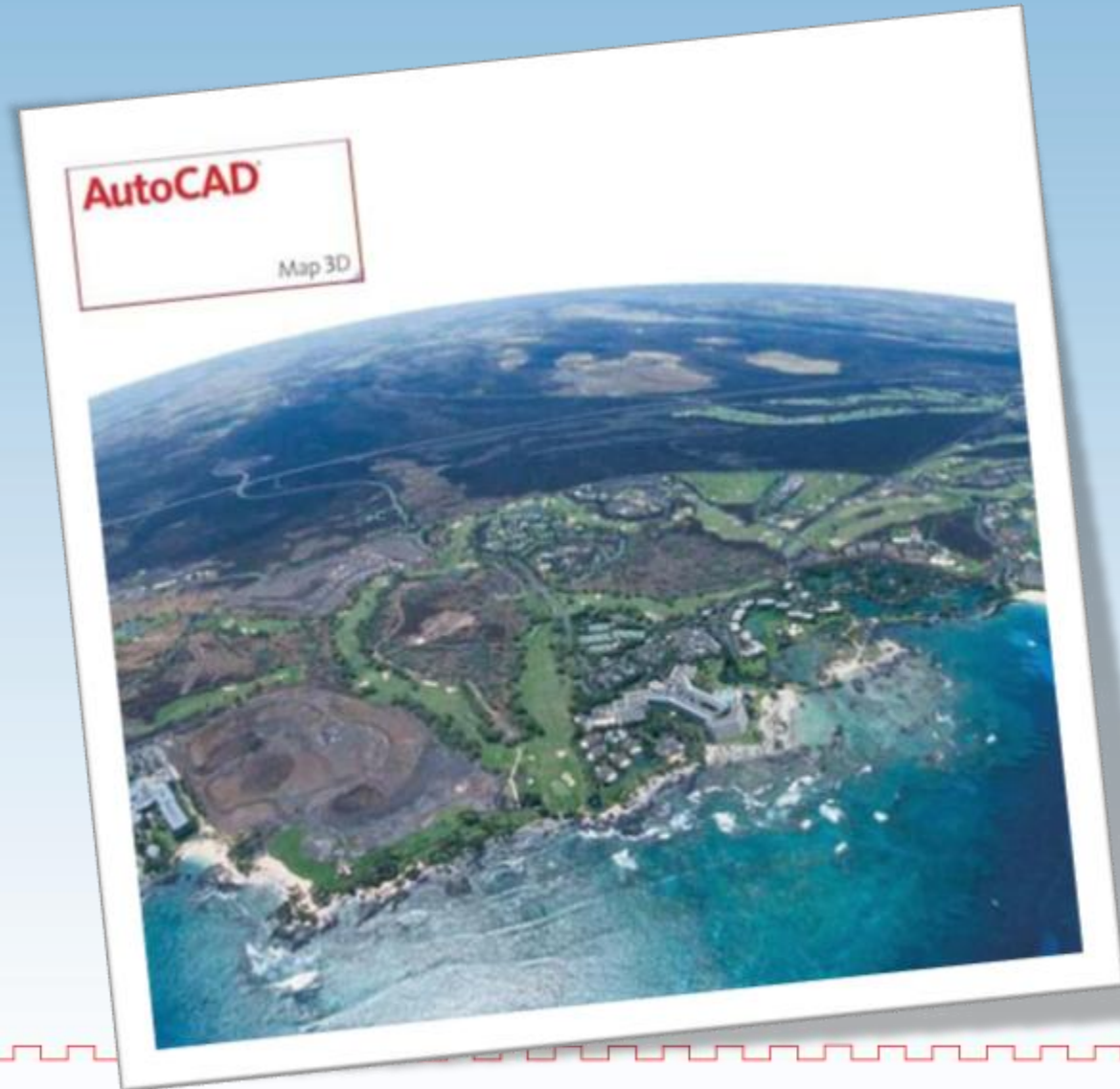
Google Uses OST Technology



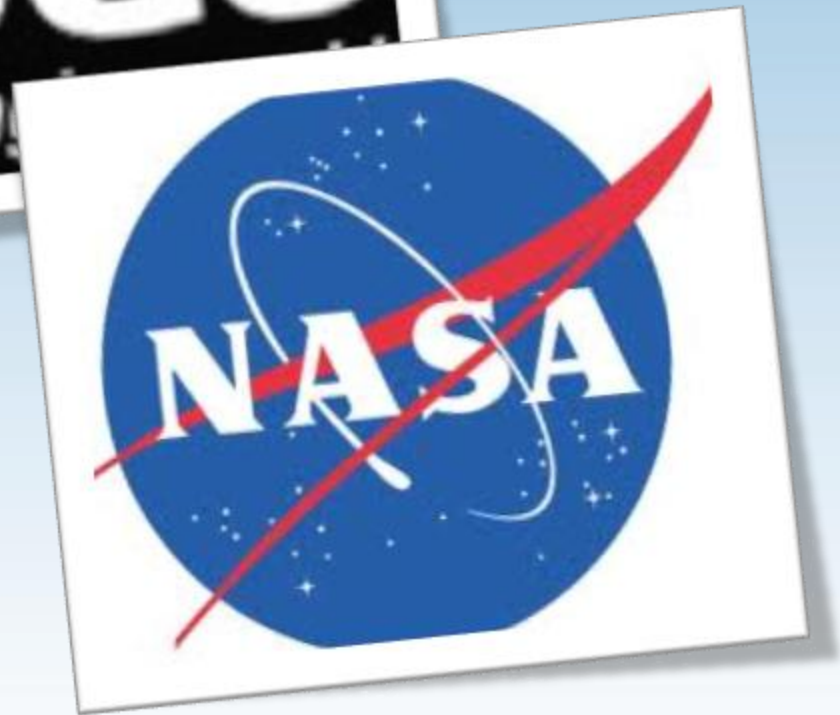
ESRI ArcMAP uses OST



Autodesk uses OST



NASA, USGS, and 900 other servers



The M&S community is starting to use OST



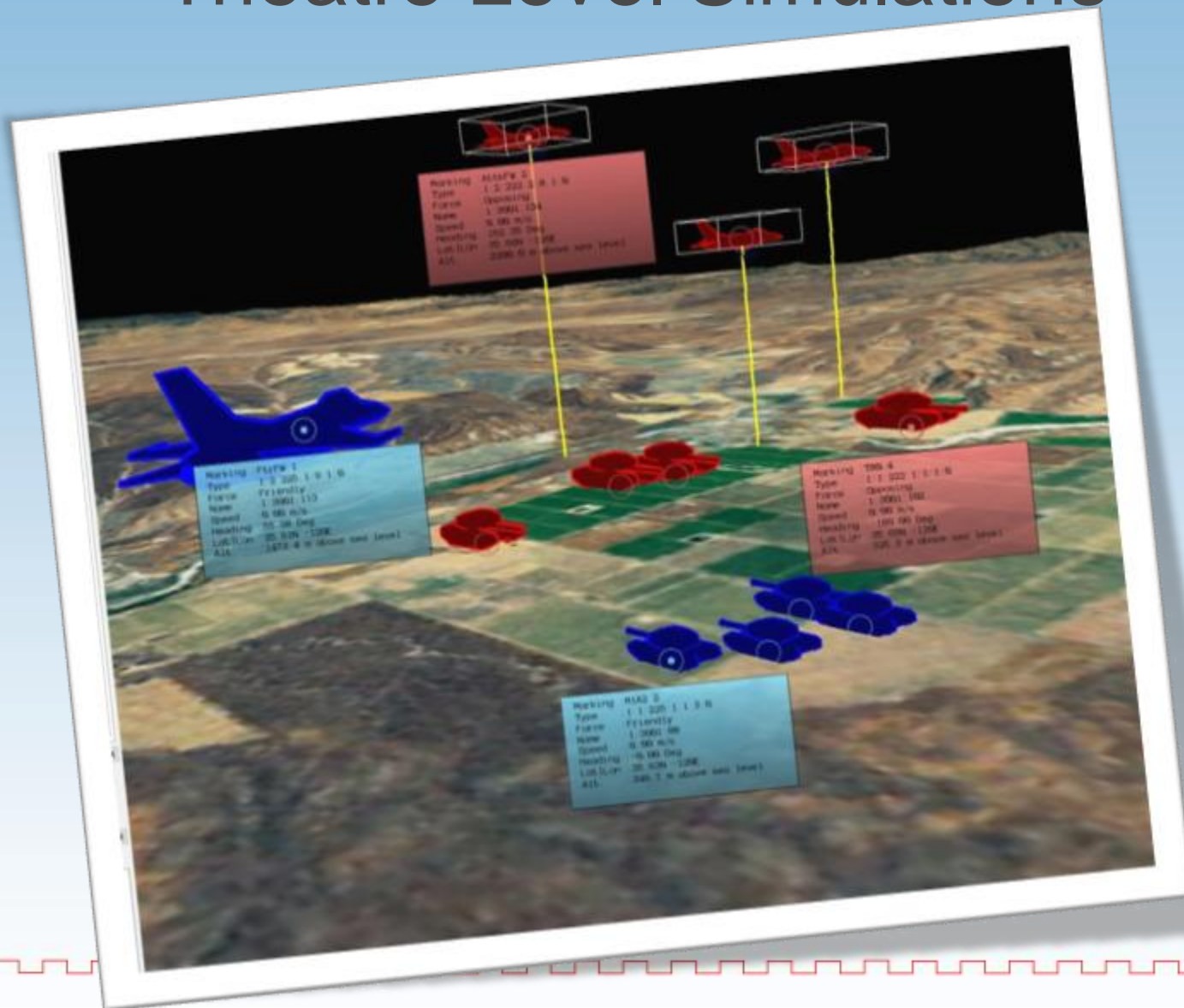
Global Missions



Air Missions



Theatre Level Simulations



Fast Prototypes



What did we learn?



Open Streaming Terrain

An alternate approach for rapid, cost-effective,
usable terrain for modeling and simulation

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