

# Rome Reborn

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**Rome Reborn** ([www.romereborn.virginia.edu](http://www.romereborn.virginia.edu)) is an international initiative, started in 1996 and based at the Institute for Advanced Technology in the Humanities (IATH; see [www.iath.virginia.edu](http://www.iath.virginia.edu)), to create 3D urban models illustrating the development of ancient Rome from the first settlement in the late Bronze Age (ca. 1,000 B.C.) to the depopulation of the city in the early Middle Ages (ca. A.D. 550). Other institutional partners have included the Politecnico di Milano, UCLA, the Université de Caen, and the Ausonius Institute at the Université de Bordeaux-III. Commercial rights to Rome Reborn have been exclusively licensed to Past Perfect Productions s.r.l., a corporation based in Rome, Italy (<http://www.pastperfectproductions.com/>).

Rome Reborn is based on the key ideas of collaborative research and scholarly communication. Each element of the city model is created by a team of subject experts working closely with experts in 3D modeling and other pertinent technologies. Thus far, over a dozen archaeologists from Italy, the United States, France, Germany, and the United Kingdom have participated in the project. When a team's contribution to the overall urban model is completed, the subject experts sign a form declaring the model complete and ready for public dissemination. The resulting model is scholarly not only in the sense that it has qualified authors but also because it offers the user transparency of evidence and argument: along with the 3D model, the project always publishes related metadata and archaeological documentation. Once the model and its documentation are georeferenced, they can be seamlessly linked in the user interface. As you explore the model, you can stop and open a window that explains the evidence and hypotheses behind the reconstruction you are seeing on the screen.

**Rome Reborn 1.0.** The first result of the project, finished in 2007, is called "Rome Reborn 1.0," a digital model of the city as it might have appeared at the height of its urban development in the time of Constantine the Great in A.D. 320. The model includes a digital terrain map with the hills, valleys, and water features of the city. It is composed of over 7,000 buildings within the late-antique Aurelian Walls, home to a multicultural population of over 1 million people. Of the 7,000 buildings, ca. 250 are known with great specificity as to identification, location, and design. These are known as the "Class I" monuments. 31 of these were made at a scale of 1:1 at UCLA. The Class II monuments are the other 6,750 buildings of the ancient city that are known from ancient sources including, notably, two late-antique catalogues of the building stock of the city. The Class II buildings are very schematic and rely heavily on textures instead of geometry for architectural details. They derive from 3D scan data collected from the "Plastico di Roma Antica," a 1:250 plaster-of-Paris physical model of the city created from the 1930s to the 1970s



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and housed in a museum in Rome. Creation of the Class II models was the responsibility of the Department of Design of the Politecnico di Milano. Rome Reborn 1.0 was created with a variety of software, all ultimately imported into MultiGen Creator and displayed on PCs as a real-time, interactive urban model using Open Scene Graph. Google Earth is used to georeference the archaeological documentation. Originally conceived for use in an immersive theater at UCLA, it is not possible to run the model on the Internet.

**Rome Reborn 1.1** was jointly created by IBM and IATH in 2008. It represents a conversion of version 1.0 into BVH format and runs on the IBM Cell platform. As compared to version 1.0, 1.1 brings improvements in illumination, frame-rate, and resolution. It also includes the Circus Maximus, a new major Class I monument created by the Ausonius Institute at the Université de Bordeaux-III (<http://www-ausonius.u-bordeaux3.fr/>).

**Rome Reborn 2.0** was jointly created by IATH, Procedural, and Mental Images in 2008. It runs on a 64-core server generously donated by Sun. Like versions 1.0 and 1.1, Rome Reborn 2.0 represents the city as it might have appeared in A.D. 320. Version 2.0 uses the 32 hand-made Class I models created at UCLA and Bordeaux and converted by IBM and IATH to 3D Studio Max format. It completely replaces the Class II models derived from the physical model with procedural models created with the CityEngine software of Procedural ([www.procedural.com/](http://www.procedural.com/)) using archaeological research undertaken by the Université de Caen ([www.unicaen.fr/rome/index.php](http://www.unicaen.fr/rome/index.php)) and by IATH. Thus, version 2.0 is greatly improved with respect to geometric detail. In contrast to versions 1.0 and 1.1, Rome Reborn 2.0 runs not only on a workstation but also-- thanks to the RealityServer software of mental images ([www.mentalimages.com/2\\_3\\_realityserver/index.html](http://www.mentalimages.com/2_3_realityserver/index.html)) -- on the Internet.