Digital Phoenix:

PROPOSED DIGITAL PHOENIX PROJECT

The Digital Phoenix Project was created in response to concerns of members of the public, private, and university communities who have expressed a long-term interest in developing and maintaining a high quality of life for this region.

The primary goal of this multiyear project is the development of a realistic digital representation of the Phoenix metropolitan area through space and time that can be experienced in ASUS Decision theater. This digital model will generate further research, discussion, and decisions on the critical issues that confront our rapidly urbanizing area.

By creating a multidimensional virtual model of Phoenix from a variety of data sources, we will be able to visualize patterns of growth and development that emerge across the continuums of space and time.

ENVIRONMENT

POPULATION

HABITAT

INDUSTRY

TRANSPORTATION

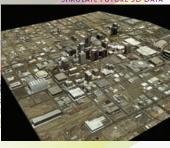
TOPOLOGY

PHOENIX

2026 FUTURE

2006 [Present]

SIMULATE FUTURE 3D DATA



The three time components—past, present, and future Phoenix—integrated into a unified framework through common data structures, will leverage the Decision Theater's capabilities.

DEVELOP CURRENT 3D DATA

ENVIRONMENT

POPULATION

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TOPOLOGY

An immediate objective is the creation of ### realistic three-dimensional images of the city #### for navigation purposes.

This visual ground work will allow specialized visualizations for specific studies, such as one that shows patterns of economic development through time.

The modeling of future environments will

patterns. A digitally constructed model of

the city will also allow us to discover what

Phoenix could have been like, starting

to the present and into the future.

enable the assessment of policy scenarios as

they play out in future urban-environmental

with historical data as the basis for projecting

A multi-dimensional journey through time

Research Components and Methods

renderings of all buildings.

The project has three main components:

- The development of a digital representation of Phoenix in the present. The creation of a digital map of Phoenix requires developing a data repository containing
- architectural, demographic, and environmental information about Phoenix
- visualization capabilities to extract and combine information from the data repository and display them in the Decision Theater
- a software framework that allows for interactive exploration of the data
- controls to drive or fly through the city and zoom in or out of particular features
- mathematical capabilities for microsimulation of events to create a living virtual city
 These five components will generate a virtual map of Phoenix in the present time and place.
 To date, no digital archive of Phoenix exists, but a few other cities have maps of the cities in this form. The Virtual London project is the most advanced, containing wire-frame

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Difference of ozone distribution between base & future years



Noise — Predicted from Development Patterns and Traffic Patterns



Household increse from 1991 until 2010

- Historical records of Phoenix that can recreate the city at previous points in time As we create the ability to digitally document the present, we will also begin to use that information to reach into the past. With the advent of computers, historical information is more and more available in digital formats, but often important qualitative information and details that do not easily convert to digital formats are lost. This project aims to advance the digital archives of Phoenix's history with a specific emphasis on the following objectives:
- Examine changes in travel behavior and transport modes
- Trace the evolution of urban form and urban morphology
- Digitally transcribe the transformation in construction materials, architectural styles, and housing attributes
- Study historical changes in environmental metrics such as air quality, water availability, and resource use
- 3. Modeling tools and theories to generate future representations of Phoenix We will also create a digital future using Digital Phoenix data and from the Phoenix UrbanSim application currently in development. This will generate scenarios that allow for the creation of "virtual futures." The specific objectives of this component of the Digital Phoenix Project are as follows:
- Implement "UrbanSim" as a land use, household, real estate, and employment allocation model for Phoenix futures based on a high resolution of available data (150 meters)
- Implement TranSims to generate traffic patterns and travel behavior to interface with UrbanSim and study travel scenarios
- Conduct sensitivity analysis on a large range of future scenarios to determine how different policies result in both intended and unintended consequences

What will the built and natural environment of the Phoenix metropolitan region look like in the year 2025 and beyond? How will the decisions we make today impact the future of this region? How can the impacts of these decisions be visualized, analyzed, and communicated to the affected population?

For more information contacts jainet Holston Herberger Center for Design Research College of Dasign Arizons State University

The Herberger Center for Design Research supports scholarly inquiry and applied research in the College of Design for the disciplines of architectura industrial design increase design. Indexcess architectural of the teichages Center for Design Researchite the College Design at Advances State University, Texts Act of visualities quarter physical attributes of Phinesis in a dynamic and physical attributes of Phinesis in a dynamic and Phinesis Wahns Research Laboratory (1902), and Patriesals for Research in Spatial Medicing (PRSM). The Perhapses Center for Design Research Laboratory (1902) and Patriesals of Research Laboratory (1902), and the Center for Design Research Laboratory (1902). And the Center for Design Research Laboratory (1902) and the Science, Depresents, and Soutiery (1905), but only the With the Decision Center for Desert Centy (1905), but of the laws had failured Science Provinciation grants. In addition project with allow Senter for partnerships, with segministics, with segministics. The project is led by a small team of principle investigators comprised of leaders from various specialized components of this project. The to leaders will be supported by a larger group or faculty investigators who will be called upon develop specific tools and engage in related

be project is also well connected to strategic froms State University research initiatives and the various regional and municipal institution at serve the public and work to enhance the sality of life in metropolities Phoenix. Project Leaders Subhrajit Guhath Jonet Holston Yoshihiro Kobaya Tim Lont Mookesh Patel

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