BIM visualizations are a powerful tool to simulate the impacts of planning initiatives on built environments before they are implemented. BIM visualizations exploit its ability to generate building forms directly from parameters, such as FAR or building heights, that are often contained in planning regulations. When carried out over an area of the city, a visual model of development can be created.

Torti Gallas has created a patented Town Information Modeling system (TIM) which marries the BIM tool with Navisworks, uniting both two and three-dimensional visualizations with multiple databases in a user-friendly software program. When married with GIS, this creates a powerful tool to make intelligent urban design and planning decisions utilizing hard data and accurate, place-based visualizations that engage clients and allow the best strategic decisions. The result eliminates many of the unintended consequences of paper regulations, creating smarter cities and improving the quality of our built environment.

This presentation will discuss the TIM system, its use of BIM models and databases, and its application to a number of planning projects undertaken for both public municipalities and private developers, in the United States and abroad. An overview of the projects, the use of BIM and TIM systems will be discussed as well as the way in which they have engaged lay and professional audiences, and permitted more strategic, better informed decision-making.

Learning Objectives:

- The use of BIM for large-scale urban design and planning problems
- Criteria for the construction of BIM models for planning purposes
- Overview of the Town Information Modeling system

**Town Information Modeling (TIM\textsuperscript{SM})**

Torti Gallas’ Town Information Modeling (TIM\textsuperscript{SM}) process is a patented modeling and data collection system that unites two- and three-dimensional visualizations with multiple databases in a single user-friendly platform. Utilizing Building Information Modeling (BIM) Technology and the NavisWorks program, a user-friendly software program that allows the easy navigation of three-dimensional models, the TIM\textsuperscript{SM} process provides users with a visual representation of both existing and future “designed” conditions. Model visualizations are linked to associated databases which reflect “before and after” impacts associated with planned physical changes, and can include anything from floor area ratio (FAR) calculations to projected population densities and traffic counts. With one click you see the transformation of an existing empty lot into its future build-out and the full-complement of associated data, which can include the extended implications of that eventual build-out. Together these provide both the images and the information, in a dynamic and user-friendly format, necessary to solve complex planning and urban design problems. Real time information to solve real problems.

TIM\textsuperscript{SM} is invaluable in assisting decision-makers to fully understand the implications of alternative planning and design proposals. TIM\textsuperscript{SM} thus provides a comprehensive visual and spatial picture of a planned project or growth planning for a town that is linked with correlative quantitative information on the impacts of implementing those plans.

TIM\textsuperscript{SM} allows for the easy testing of various design options. This cross disciplinary capacity is especially valuable for complex neighborhood- or town - scale projects, where a simultaneous equation often exists between a broad range of factors such as land use, population density, traffic capacity and urban design vision. The capacity of the model to test and understand the consequences of any given decision in a holistic manner, allowing for its complete ramifications to be understood, allows for the selection of optimal solutions where every category of evaluation wins.

The TIM\textsuperscript{SM} process begins with the construction of a three-dimensional model of the existing conditions of a site, a neighborhood or a town. A typical TIM\textsuperscript{SM} model accurately renders topography, road right-of-ways, existing building footprints and 3-D massing, and block and lot subdivisions. Once the existing conditions model is constructed, additional visualizations and the links to databases are made. Each model and database is tailored to the specific needs of the client and the project. Additional model constructions can include other planned but not yet constructed projects, or the potential build-out of existing sites. The use of BIM allows the latter to be modeled simultaneous with the numerical calculation of impacts.
Al Wasl is a new town rising in the desert to the northwest of Riyadh, in the Kingdom of Saudi Arabia. Located at the foot of the Al Wasl tributary of Wadi Hanifah, this new town is a carefully crafted walkable community that has a distinct sense of place created for great family living. The new town includes vibrant retail, a convenient employment campus, an advanced hospital, a sports complex, a college campus, numerous schools, local municipal services, and, of course, a diverse mix of residences. Housing opportunities range from condominiums in the shopping district to luxury high-rise apartments along with townhouses, villas and palaces. Each neighborhood is complete with mosques, shopping, parks, and schools that will complete all aspects of daily living. Importantly, regional transit will conveniently link Al Wasl to downtown Riyadh and a local shuttle will provide residents with easy access to all of the amenities that Al Wasl has to offer.

Nestled between a series of large parks and wadis, the Old Town District and the Uptown District provide settings that celebrate traditional Saudi culture with both regional vernacular architecture.

Torti Gallas used our proprietary Town Information Modeling (TIM) approach to help the client plan and program a 64-block area of Al Wasl including high-rise and low-rise residential, civic, retail, and office buildings. The project involved interpreting the design guidelines to simultaneously project the physical urban design and development program on a building by building and floor by floor basis, and the resultant financial implications. This application of TIM enabled Torti Gallas to conduct “what if” scenarios on each city block to determine the impact of distributing height and density throughout the site. By modeling the buildings, open space, parking, etc, the TIM model enabled Torti Gallas to develop not only a physical 3D visualization of the Master Plan that represents the character of the place, but also an automated system to calculate and produce detailed programming reports tied to individual buildings and blocks.
Torti Gallas led the planning process to create a Form Based Code and a TIM℠ Process (Town Information Modeling) for a major area of Honolulu between downtown and Waikiki.

Our proprietary TIM℠ Process was an integral part of the Mauka planning process, used to cross check the Code and to assemble data of model elements, including building and land-use area, FAR and other relevant data. The model depicts existing and proposed build out and serves as an ongoing planning tool for the Hawaii Community Development Authority to test future development scenarios. The model 3-dimensionally depicts the study area and surroundings, including the nearby harbor, crater and mountains. The model includes over 40 million SF of existing and proposed built-out land use conditions with a schedule of related data that is linked by land use to each block.

A series of public and strategic stakeholder meetings helped guide the process to create a Form Based Code that thoughtfully synthesized the goals and policies in the community’s Master Plan. The Form Based Code for the 400 acre area includes Development Standards for seven neighborhoods, each with different character and form. The Code preserves the idiosyncrasies of the individual neighborhoods, while introducing Build-to Lines to enclose the street and a series of permitted Building and Frontage Types to capture the spirit of each neighborhood and of Hawaii. View corridors in the Code preserve Mauka / Makai views- from the mountains to the ocean- through strategic setbacks, siting of building voids, and landscaping strategies. The Code regulates both the private and the public frontage through a Pedestrian Zone that focuses on the space between the face of the building and the curb. Sustainable development and progressive parking standards are included and through the Code’s Large Lots and Subdivision section, large blocks are broken up with pedestrian passageways and restrictions on building and block sizes.

Examples from the Form Based Code