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Project

Destiny: A Case Study

Organization

Leftwich Consulting

Sector

Urban Design City Planning

Objective

New city master plan for a 4100 acre city development

Highlights

- 4100 acre new city development
- Top down traffic planning of completely new city infrastructure
- Transit route, arterial and freeway connections to SR60
- 2050 design year

Contact Point

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Destiny: A Case Study

Destiny is a proposed New City master planned on 41,000 acres located in southeastern Osceola County, Florida, in close proximity to the border of Okeechobee and Indian River Counties. Proposed land use at build-out in Year 2050 includes more than 80,000 residential units, 10 million square feet of non-residential space, and 20 schools. SR 60 runs through the middle of the property, while U.S. 441 and Florida's Turnpike form the eastern border of the project.

Destiny is conceived as eight inter-connected Villages radiating from a sustainable urban core. The current site plan proposes a dense urban core approximately 4.5 miles from the Florida Turnpike along SR 60. An extensive grid network is proposed to radiate outward from the urban core with multimodal arterials to provide connectivity to village centers that are surrounded by residential land uses. The connectivity will be masked by vast open spaces that include golf courses, parks, and water features. Its mass transit transportation system, predicated on walk-ability to transit stations and stops, maximizes internal capture and minimizes automobile dependency. Destiny will boast an array of public transit solutions including rail, buses, trams, people movers and an airport. Private alternatives include taxis, street legal personal electric carts, bikes, walking, and watercraft.

For the purpose of forecasting traffic patterns influenced by Destiny, travel demand models on both the regional (macroscopic) daily and local (microscopic) peak hour scales were created. The macroscopic model involved merging several existing regional models together, followed by a large calibration effort for the new "mega" model that encompasses the potential regional study area for Destiny. The microscopic model focuses more on local travel patterns within the project and is being used as a design aid for all project modes.

To achieve the grand vision of the Destiny Project requires a vast amount of forethought. Fortunately, transportation planning has been aided by the recent advancements in simulation software such as Quadstone's Paramics (Parallel Computer Microscopic Simulation) package. Microscopic traffic flow models, such as Paramics, simulate single vehicle units on a virtual roadway network with dynamic variables for each vehicle unit displayed (i.e. position and velocity). An added benefit of Paramics is the ability to analyze the effect of geometric inputs such as roadway alignments, queue lengths, and traffic control devices on traffic routing and smoothness of traffic flow. This tool lets planners to "see" the effect of a design before an expensive implementation.



The most recent Density site plan (January 08) was used to create a preliminary microscopic model to include the extent of the Project proposed transportation network. The Density Micro Model provides a better understanding of how the trips flow throughout the project by using O/D tables that correspond to the following modes: conventional autos, trucks, Neighborhood Electric Vehicles, and transit. Similarly to the macro model, the micro model also accepts roadway attributes (speed, number of lanes, intersection geometry) that simulates capacity and logically routes traffic based on the affect of congestion. Figures 1 through Figure 3 illustrate the Destiny Micro Model network as coded to date.

The design of an internal roadway that promotes transit ridership supports additional mode split (NEV, pedestrian, etc.), and encourages internal capture of trips is an iterative process. Planning is made more efficient with the use of a micro model to determine how altering the design of the

