

A world map with a blue grid overlay, serving as a background for the slide. The map shows major continents and oceans, with labels like 'UNITED STATES', 'ATLANTIC', 'INDIAN OCEAN', and 'AUSTRALIA'.

# Place Type-Oriented Land Use Simulation for Land Use/Transportation Decision Making

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# Land Use Scenario and Place Type

# Scenario Planning

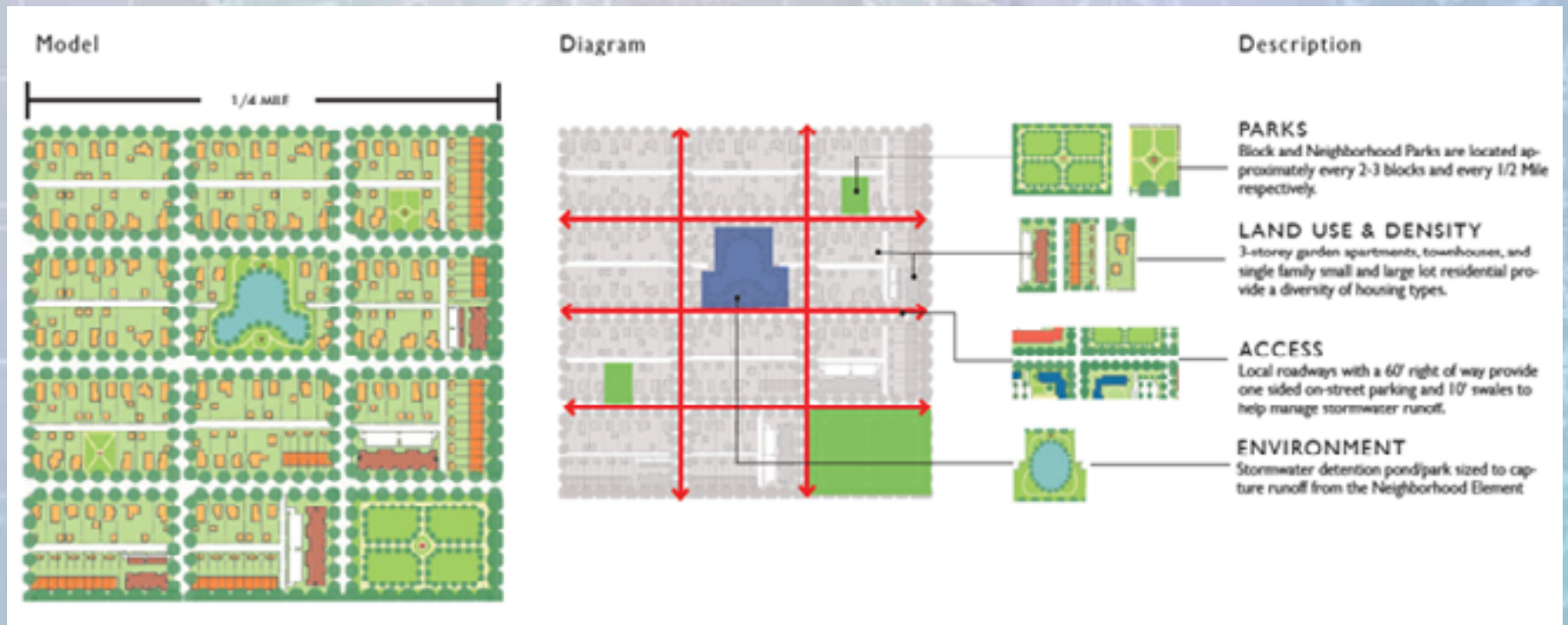
- ❖ A process that uses scenarios to assess the future utilizes a series of scenarios to gauge possible future conditions
- ❖ Due to the strong relationship between land use patterns and travel behavior, scenario planning integrating land use and transportation has become much more wide spread
- ❖ A survey in 2005 identified 79 land use/transportation scenario planning in US



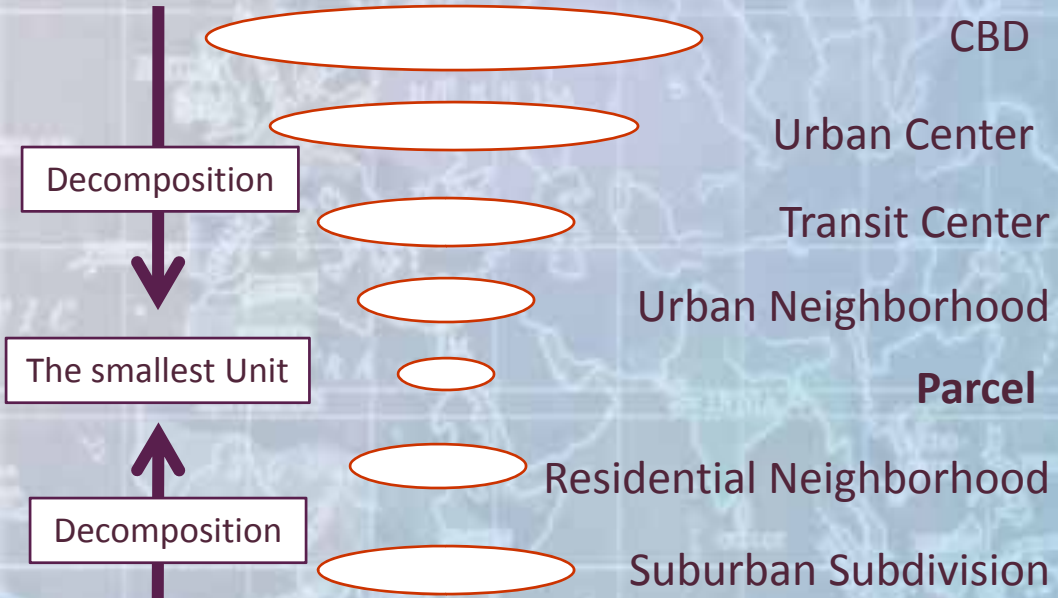
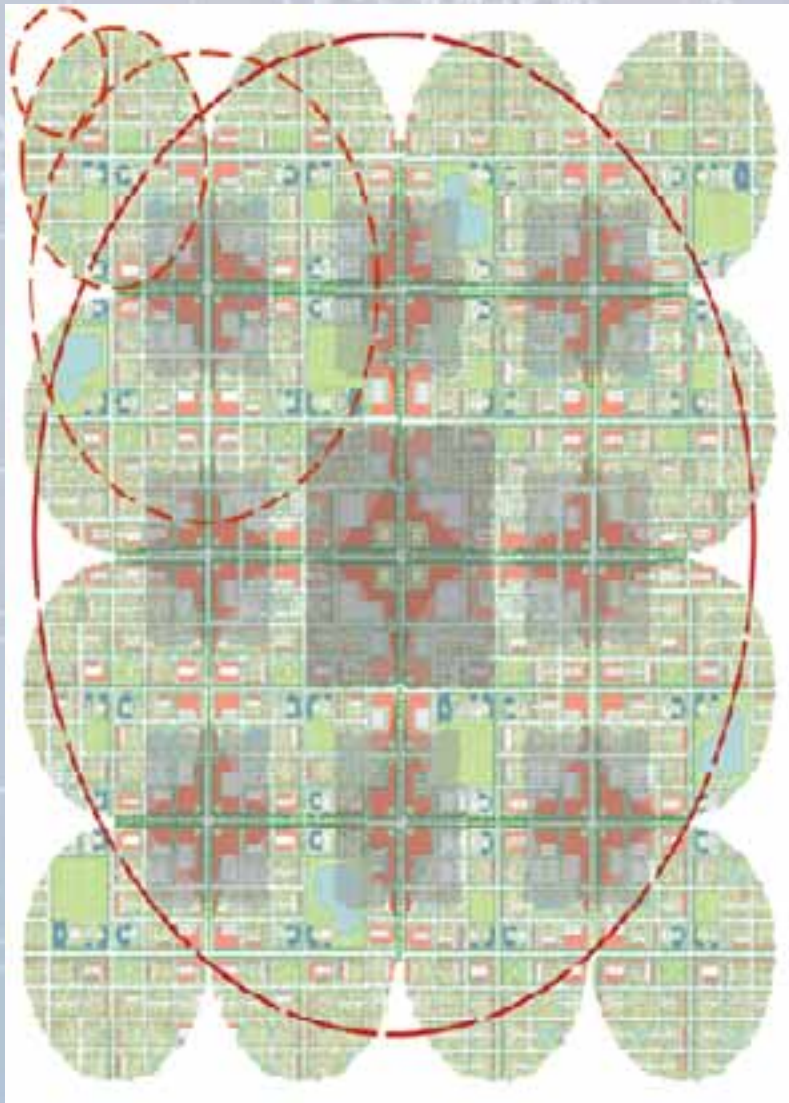


# Concept of Place Type

- ❖ Place Type - a way to design and define land use patterns
- ❖ A place Type reflects pedestrian shed
  - ❖ ¼ mile diameter area (40 acres)
  - ❖ Combination of different building/parcel types in the shed



# Decomposition of Urban Space





# Re-composition of Urban Space

## Parcels



## Place Types

# Example of Place Type



## Land use detail

Dwelling Units/Acre	5
Non-Residential FAR	0.72

Non-Developable		Developable	
Park	2 %	SF House	3 %
Retention	2 %	Apartment	12 %
Road	15 %	Mixed Use	6 %
Civic	15 %	Retail	12 %
Parking	5 %	Office	28 %
Total	39 %	Total	61 %
GRAND TOTAL			100 %

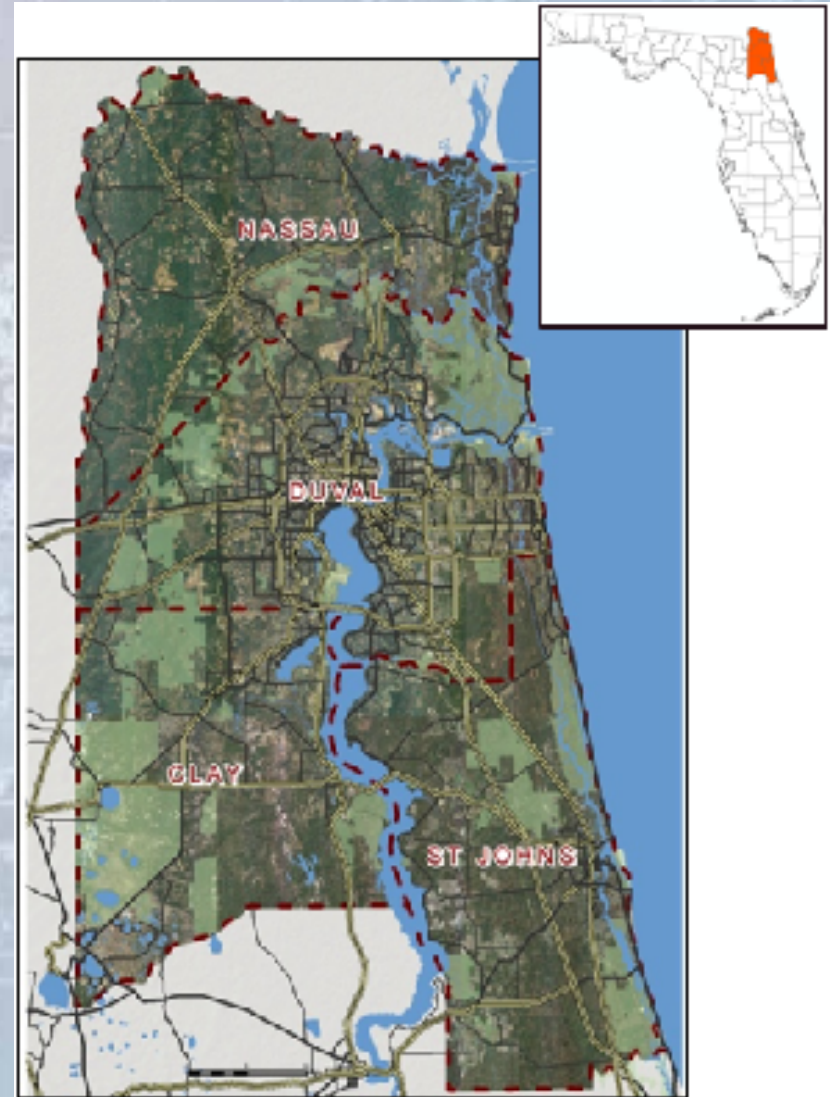


**CorPlan Application  
- NFRPO Land Use Scenario Planning-**



# Project Overview

- ❖ Land use scenario planning in conjunction with 2035 Long Range Transportation Plan (LRTP) of North Florida Transportation Planning Organization
- ❖ Exploring alternative land use concepts and the associated long term transportation impacts and opportunities



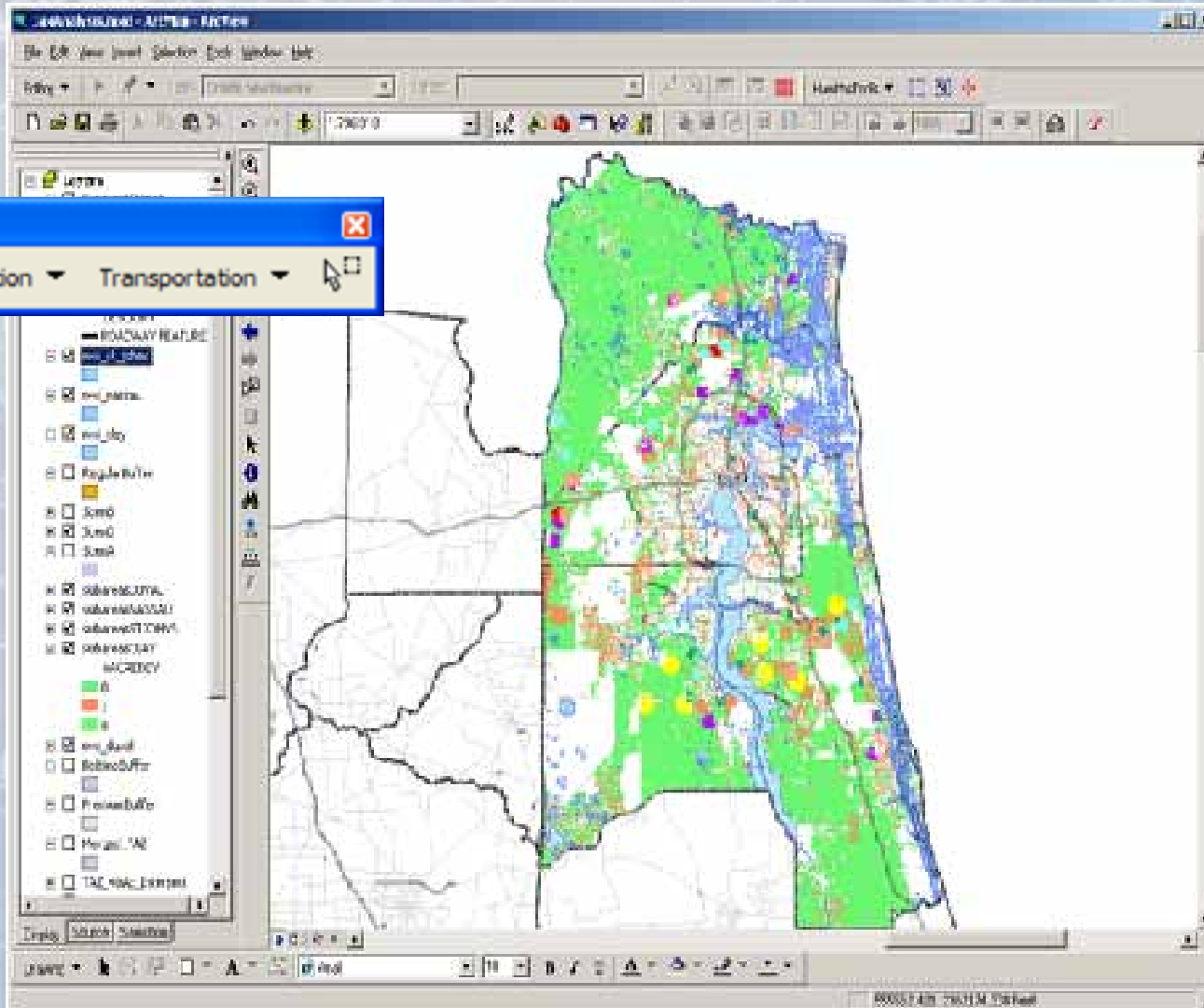
# Base of Land Use Alternatives

- ❖ **Developing future land use alternatives in the region in order to accommodate projected population and employment growth**

County	2005		Increment 2005-2035		Annual Growth Rate	
	Population	Employment	Population	Employment	Population	Employment
Clay	184,624	47,374	132,176	25,270	1.84%	1.44%
Nassau	67,681	20,213	38,819	10,782	1.52%	1.44%
St. Johns	157,981	65,666	168,382	35,027	2.45%	1.44%
Duval	855,572	509,112	362,428	271,564	1.18%	1.44%
Total	1,262,795	642,365	701,805	342,643	Avg .1.48%	Avg. 1.44%

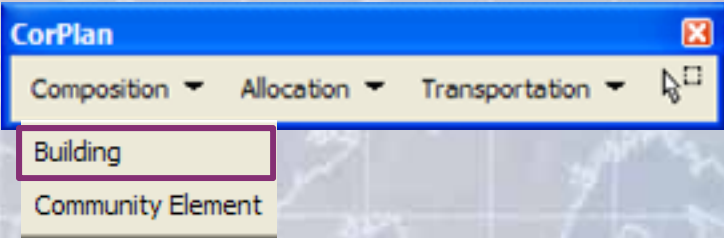
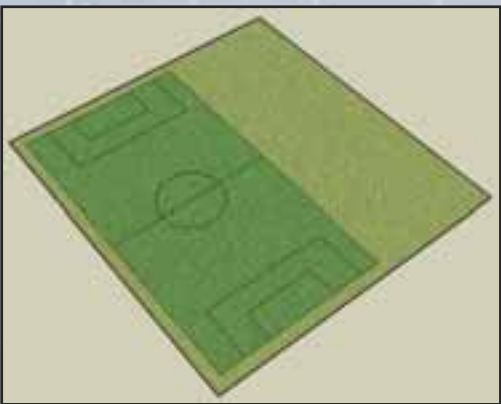
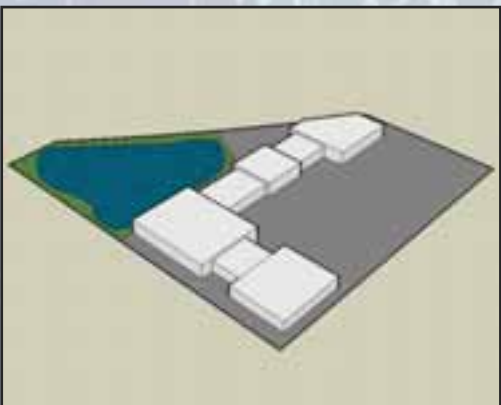
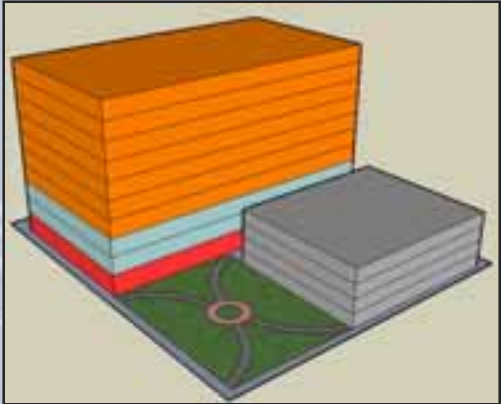
# CorPlan

- ❖ A customized GIS land use simulation tool that allows creating and allocating place types





# Designing Parcel with CorPlan



### Building Type

Building Type Library Table  
C:\Projects\SunGrove\SG\_Building.dbf

Building Types: Mixed Use - High Rise

BLDG Category	Household Type	DU/Acre	FAR
<input type="radio"/> Residential	<input type="radio"/> Single Family	76.23	5
<input type="radio"/> Employment	<input type="radio"/> Townhouse		
<input checked="" type="radio"/> Mixed Use	<input checked="" type="radio"/> Multi Family		1.8
<input type="radio"/> Other	<input type="radio"/> None		

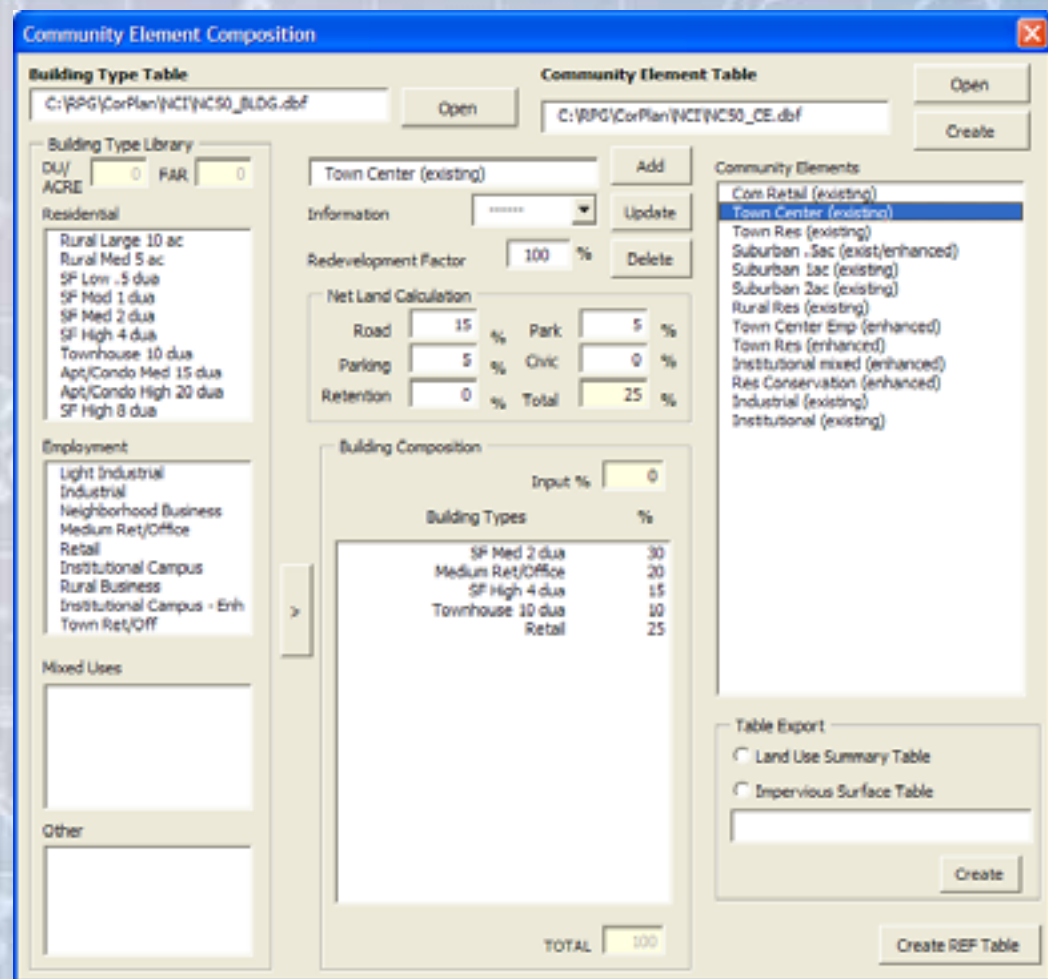
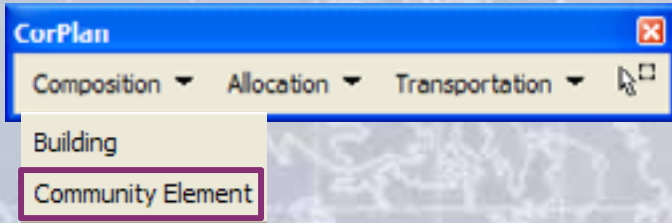
Building Usage	Ratio	SQFT for Unit & Emp	Parking Stall Requirement
Residential	70 %	2000 SF/Unit	1.5 / Unit
Commercial	10 %	600 SF/Emp	5 /1K SF
Service	20 %	400 SF/Emp	3 /1K SF
Industrial	0 %	1000 SF/Emp	1 /1K SF
TOTAL	100 %		Stall Size 500 SF

Parcel Usages	Percentage
Building	50 %
Parking	30 %
Retention	0 %
Open Space	20 %
TOTAL	100 %

Redevelopment Factor: 100 %  
Building Story: 10  
Parking Story: 4

❖ Any kind of parcels can be modeled from high-raised mixed used lot to community park.

# Creation of Place Types



- ❖ A place type is a combination of different parcel types.
- ❖ Parcels can be pulled out from the list of parcels created earlier.

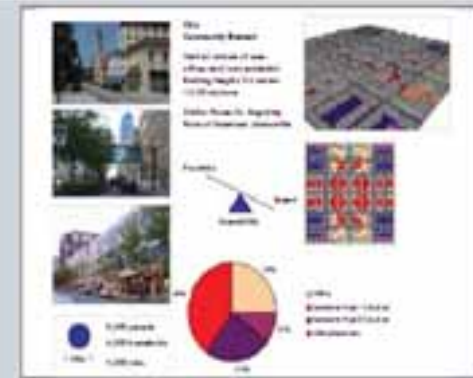
# Community Element for the Project



Town / TOD



Village



City



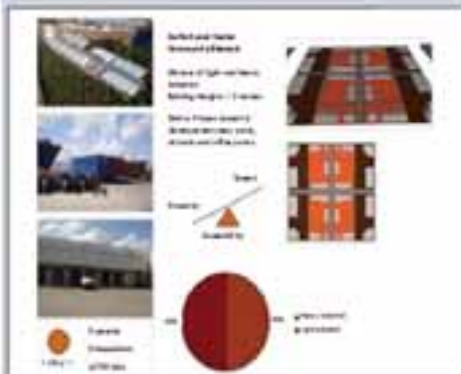
Cowtown / CTR



Suburban Neighborhood



City Neighborhood

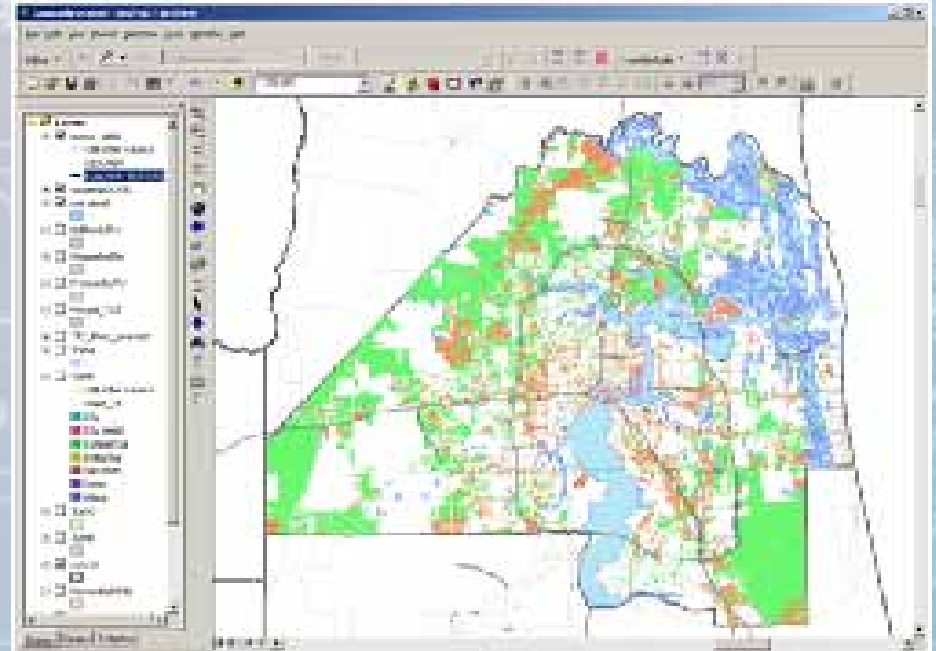


Industrial Center



# Base Polygon Preparation

- ❖ **Defining geographic unit of analysis**
  - ❖ Polygrids or parcel polygons
  - ❖ Homogenous land use within polygon
- ❖ **Classifying a study area into three categories**
  - ❖ **Undevelopable area**
    - ❖ environmental area, ROW, SF residential area, ...
  - ❖ **Redevelopable area**
    - ❖ built non-residential area
  - ❖ **Developable area**
    - ❖ vacant and agricultural land



# Allocation of Place Types

The screenshot displays a GIS application window titled 'LocalGovernment - Bishop - ArcView'. The main map area shows a land use allocation with various colors: red, green, cyan, and white. A pie chart in the top-left corner shows the distribution of place types. A dialog box titled 'Community Element Assignment' is open in the foreground, showing a list of community element types and a summary of the selected area.

**Community Element Assignment Dialog:**

**Community Element Type**

- Com Retail (existing)
- Institutional (existing)
- Town Center (existing)**
- Town Res (existing)
- Suburban 1ac (exist/enhanced)
- Suburban 1ac (existing)
- Suburban 2ac (existing)
- Rural Res (existing)
- Town Center Emp (enhanced)
- Town Res (enhanced)
- Institutional mixed (enhanced)
- Res Conservation (enhanced)
- Industrial (existing)

**Summary of Selected Area**

657 Acre

**Composition**

**Dwelling Units**

MF	0
TH	537
SF	591

**Total Square Footage**

Commercial	21	1,658,001
Service	10	756,564
Industrial	0	0

Buttons: Un-Assign, Assign, Update, Summary

# Allocation Results Review

## ❖ Summary Interface

- ❖ Providing socio-economic data based on allocation
- ❖ Keeping tracking allocation in overall or in particular areas

**DATA SUMMARY**

Calculate

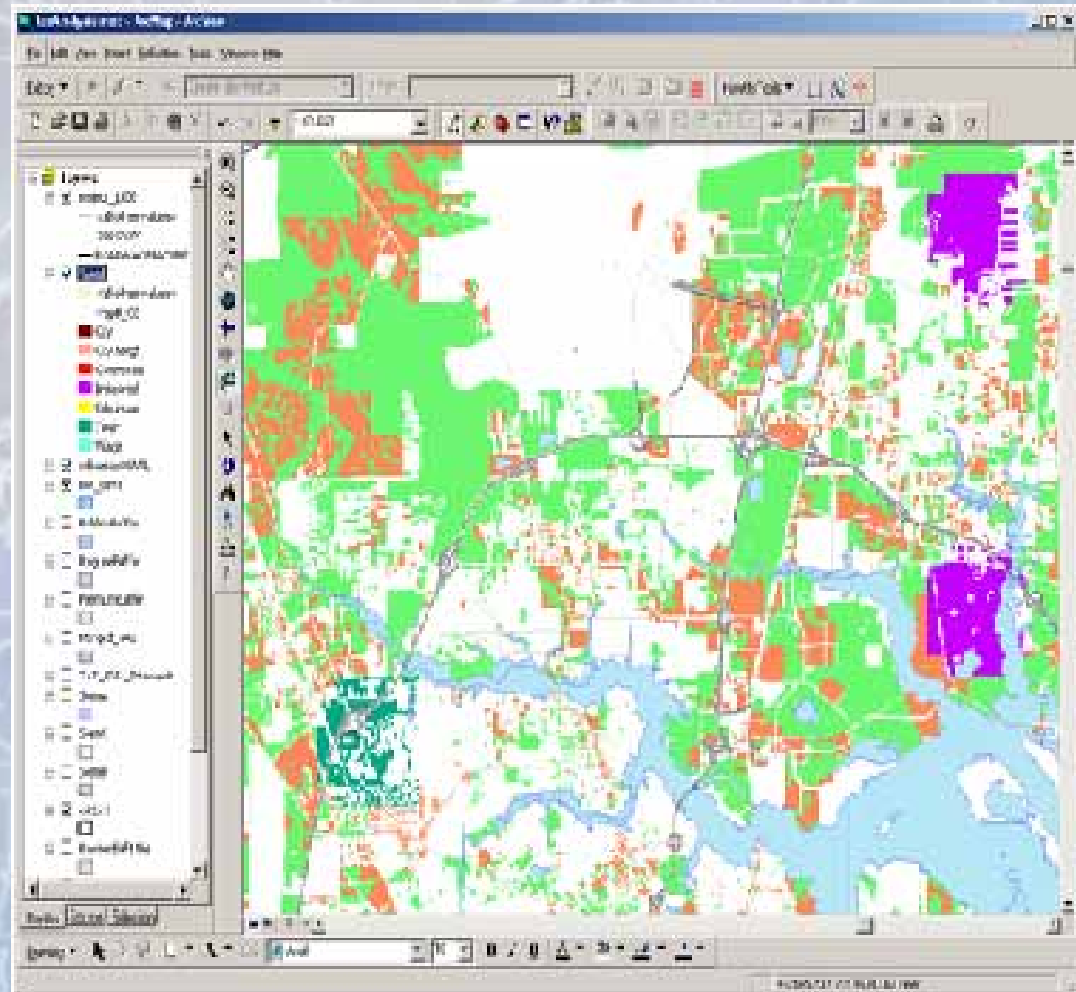
Density  
Ave. FAR: 0.53 DU / Acre: 51.1

**Residential Statistics**

	# of HH	%	Population	%
Single Family	660	31	510	39
Multi Family	730	34	656	49
Town House	750	35	168	13
<b>Total</b>	<b>2,140</b>	<b>100</b>	<b>1,343</b>	<b>100</b>
<b>Control Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

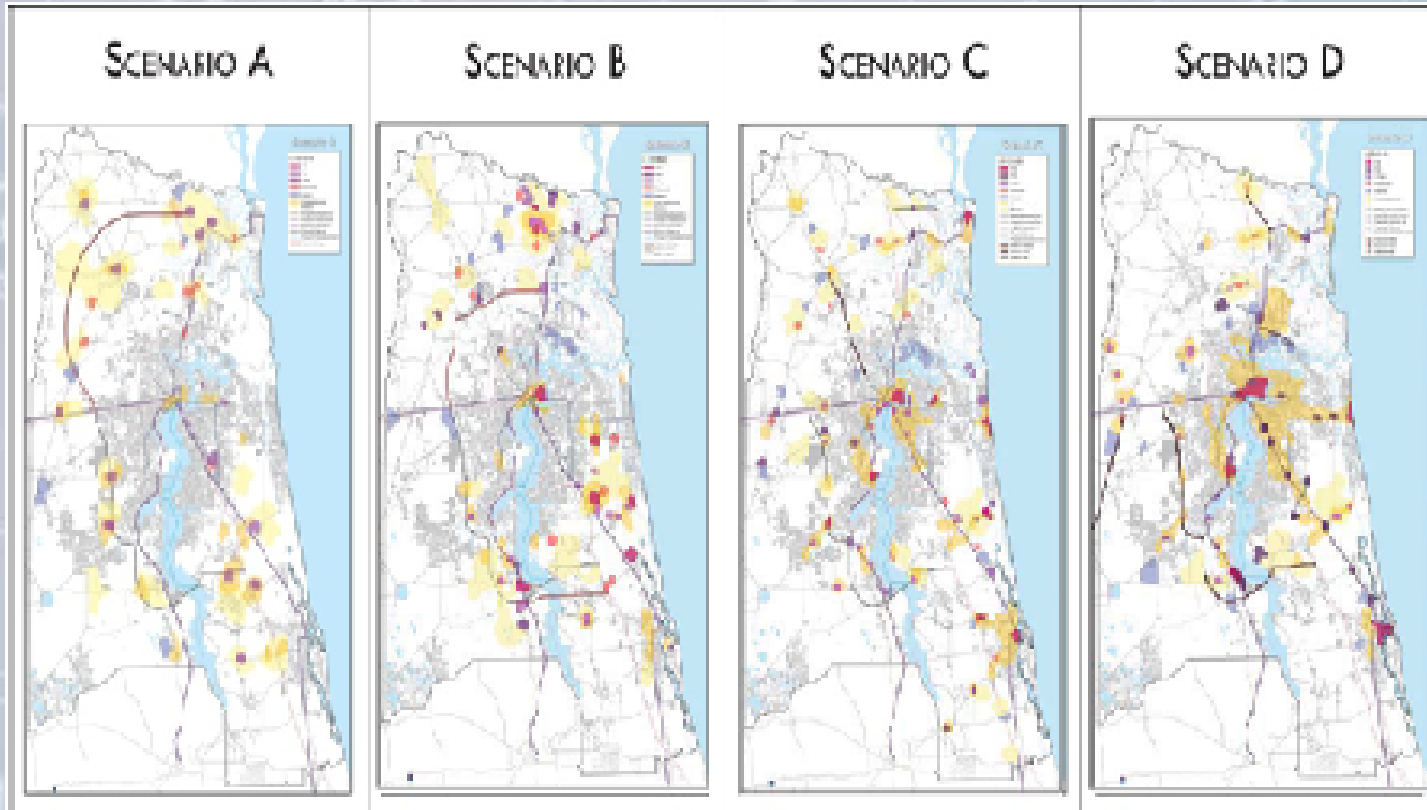
**Non-Residential Statistics**

	Soft	%	# of Employee	%
Commercial	190,048	30	770	31
Service	448,896	70	1,610	65
Industry	0	0	105	4
<b>Total</b>	<b>639,744</b>	<b>100</b>	<b>2,485</b>	<b>100</b>
<b>Control Total</b>			<b>0</b>	<b>0</b>





# Development of Four Scenarios

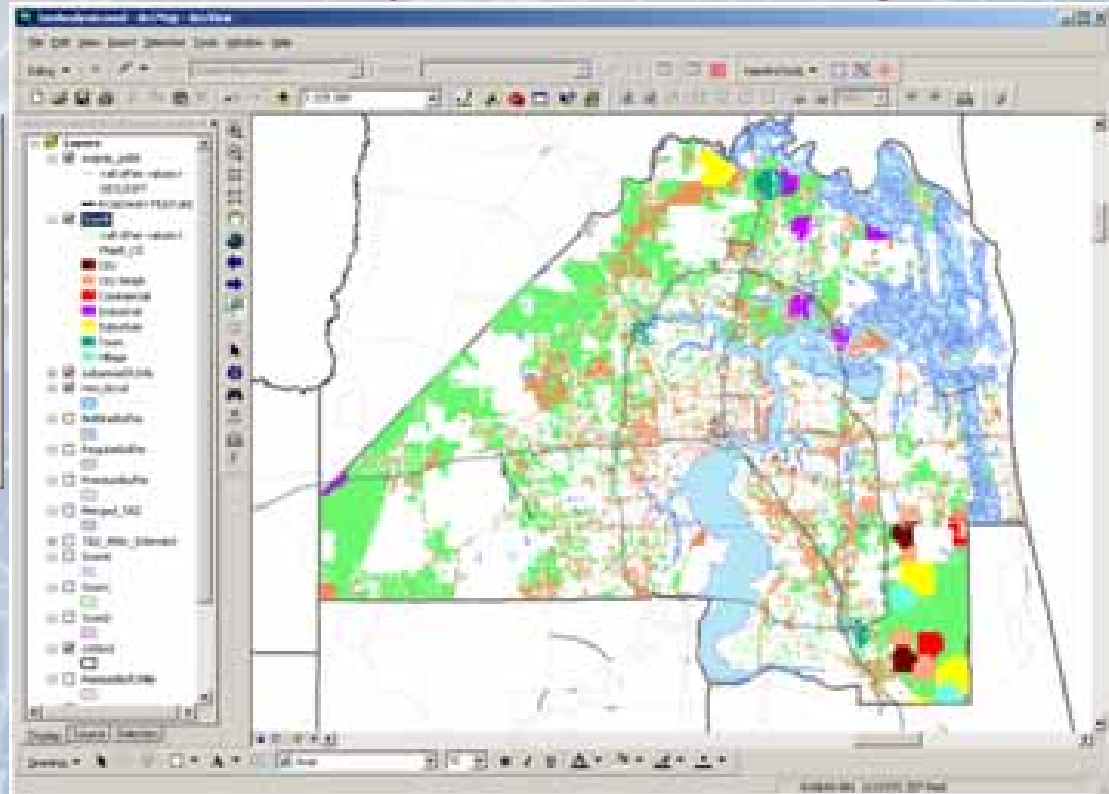


- ❖ Scenario A – Concentric Outer Growth
- ❖ Scenario B – North-South Centers Growth
- ❖ Scenario C – Satellite Centers Growth
- ❖ Scenario D – Transit Centers Growth

# Allocation Results Export






## ❖ Data Export Interface

- ❖ Summarizing allocated data by any geographical boundary (TAZ or census block) or place type
- ❖ Allowing exporting the summarized data in a format of DBF for further analysis
- ❖ Generating input data for transportation modeling



# Scenario Comparison

❖ Using the GIS layer, a variety of GIS analysis can be performed for the scenario comparison purposes.

	TREND SCENARIO	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D
PERFORMANCE MEASURES					
Total acreage of existing agricultural lands converted to urbanized lands	66,166	44,017	37,995	45,147	31,831
Persons per acre of developed lands (efficiency of urbanized land)	6.28	9.95	10.66	9.57	11.31
% of new households accommodated through redevelopment	17%	3%	2%	4%	18%
% of new jobs accommodated through redevelopment	18%	4%	2%	5%	22%



# Summary

- ❖ **CorPlan, a customized ArcGIS application, allows creating and spatially allocating urban place types.**
- ❖ **Variety of land use scenarios can be built from the spatial allocation of place types.**
- ❖ **ArcGIS supports performing the spatial analysis of developed scenarios.**
- ❖ **CorPlan supports transportation decision making by comparing different land use development patterns.**