

WHATIF?

GROWTH MODELLING AND SIMULATION

WHAT IS GROWTH MODELLING?

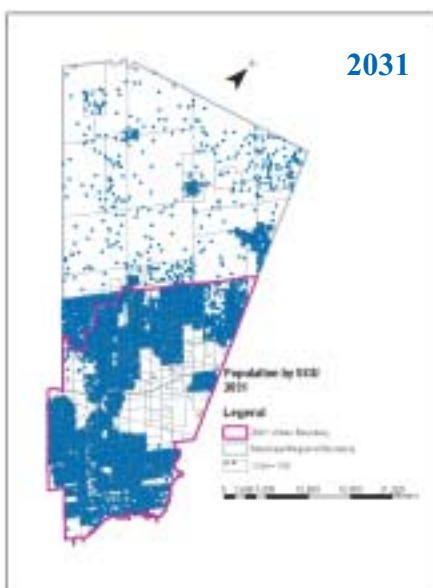
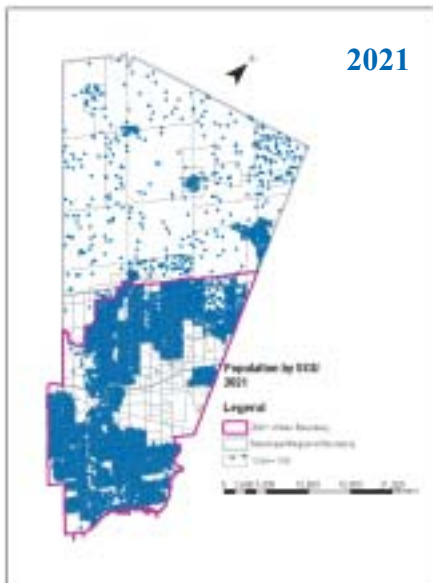
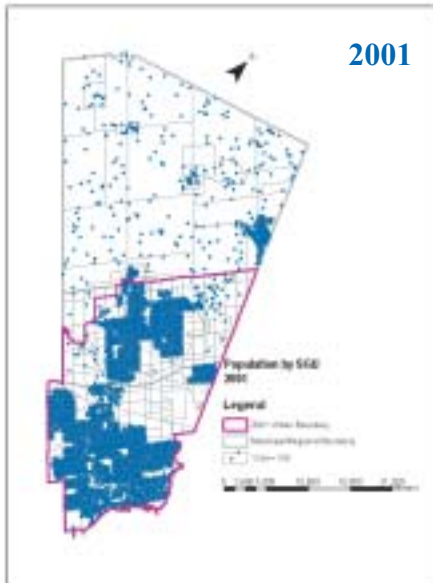
- In the next 30 years, Peel's population is expected to grow from 1.0 million to 1.5 million persons. Computer modelling assists us in understanding the implications of various growth scenarios. Based on the analysis of these scenarios, planners can advise Council on policies to protect key environmental and agricultural features, to provide information in a timely fashion, and to ensure growth can be managed properly to help guarantee the high quality of life residents currently enjoy.

WHAT IS WHATIF?

- whatif? is a suite of software technologies that provide an environment for the development of a model for policy analysis, strategic planning and decision support.
- whatif? can be used to calculate the amount and location of land to accommodate the projected population and employment growth anticipated in the future.

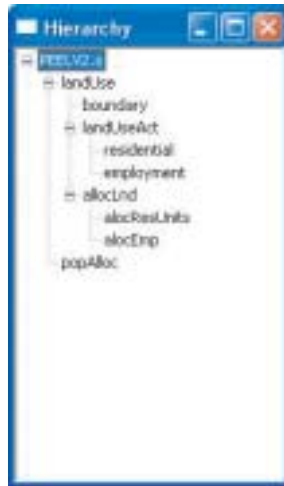
WHY DO WE NEED WHATIF? AND GROWTH MODELLING?

- Growth modelling is intended to give policy makers a computational framework for analyzing the impacts of where future land demand for population and employment related land uses could occur.
- whatif? provides the ability to analyze and compare simultaneously several growth scenarios based on a differing set of assumptions about the location of land to be designated for development and the density of development.



A

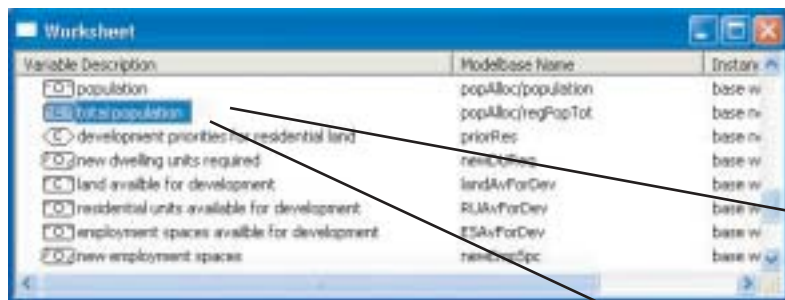
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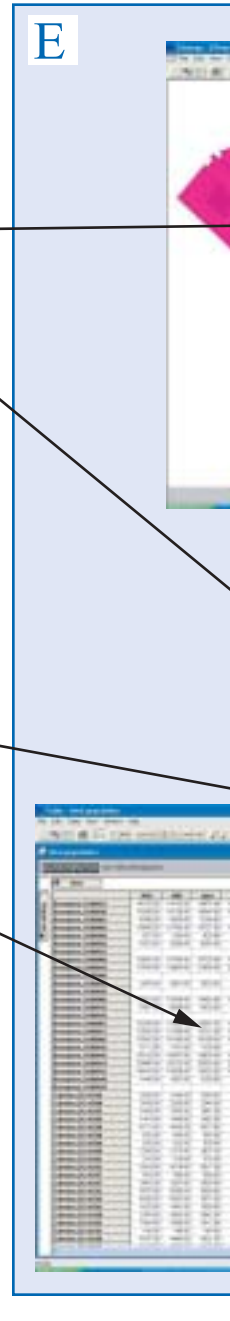
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D



E



A. SCENARIO ANALYSIS:

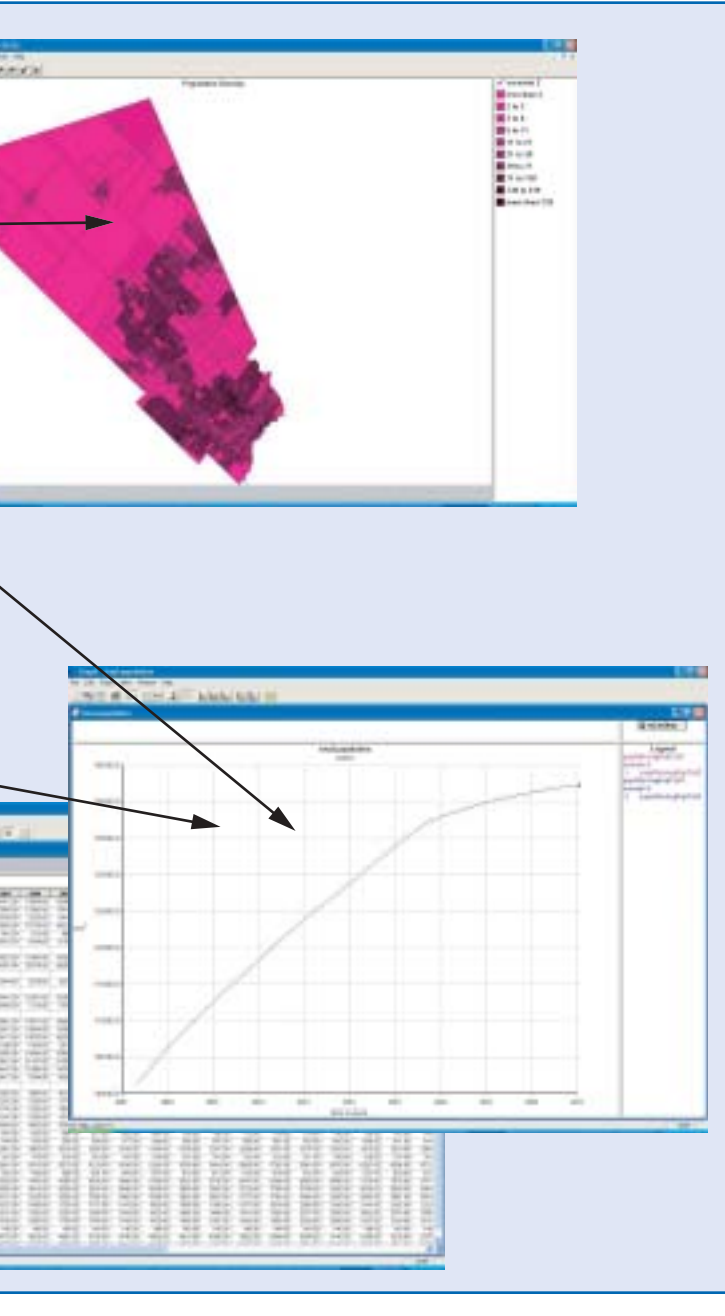
- whatIf? provides a framework for managing scenarios and maintaining the integrity of multiple scenarios.
- A hierarchy structure is used to organize and manage the components of a framework.

B. HIERARCHY WINDOW:

- Stores the model structure.
- Allows access to model information by module.

C. SCENARIOS WINDOW:

- The model remembers which input settings give rise to model results.
- Scenario descriptions are off-loaded from a user when saved.
- Model is only run on an as needed basis.



D. WORKSHEET WINDOW:

- Lists all model variables.
- Work area for new scenarios.

E. GEOMAP, TABLE AND GRAPH:

- whatIf? provides facilities for interactive display and creation of data using line graphics (graphs), tables and maps.

ACCOMPLISHMENTS TO DATE

Phase 1 of this multi-phase project has been successfully completed. The following accomplishments were achieved:

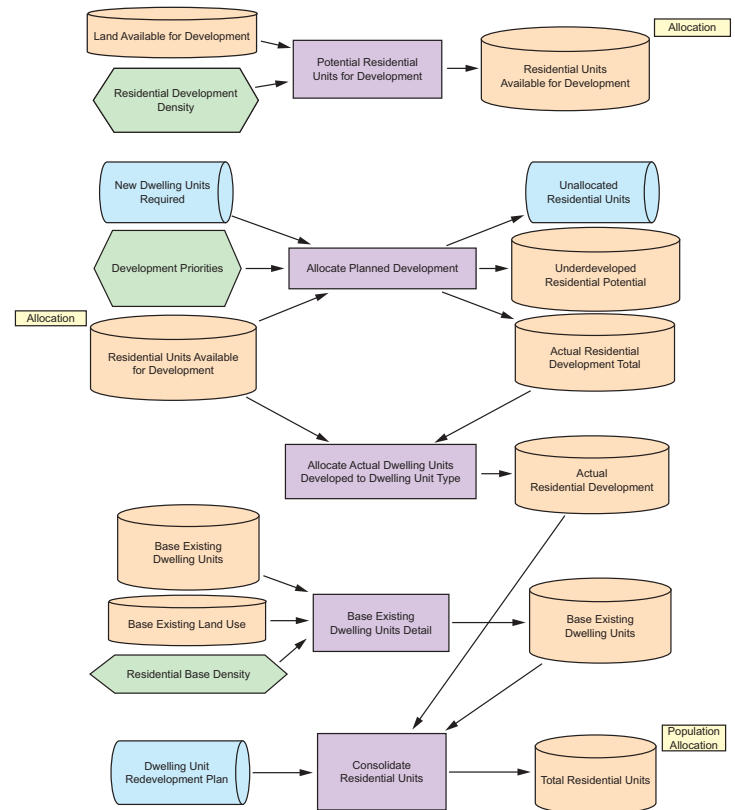
- simulation model for allocation of Secondary Plan forecasts was designed, tested and implemented;
- forecasts of population, dwelling units and employment were allocated to Small Geographic Units (SGUs);
- modelling results were used in the Public Works Sanitary Sewer Model and Water Model;
- verification of input data for an update of Development Charges By-law was completed;
- forecasts of population and employment by Traffic Zones were generated and used in the Brampton Transit and Transportation Master Plan (TTMP);
- SGU level of forecasts now enables us to respond to requests for projections at different levels of small geography (e.g. Peel Police - Police Patrol Zones, school boards - SGUs or School Catchment Areas, Public Works - Waste Collection Zones, etc.);
- a range of data sets was either updated or created, which can now be used for various planning analyses;
- extensive knowledge related to forecasting of population and employment was gained;
- significant expertise in running the model was established.

MAJOR FINDINGS

The major findings from Phase 1 included:

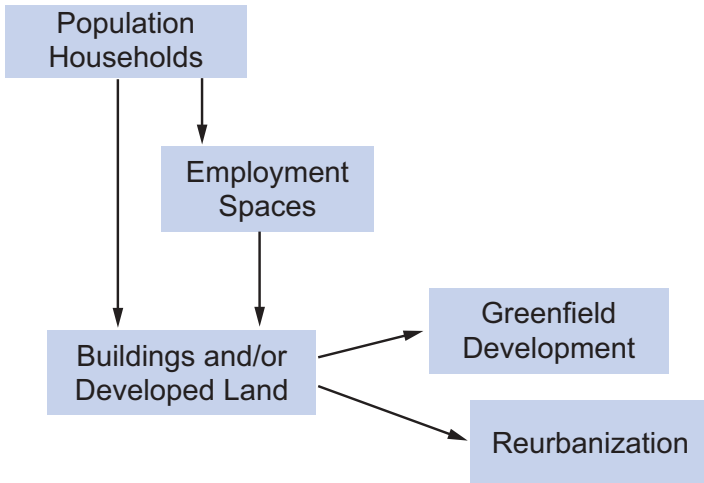
- allocation procedure should be done from a municipal level, which is more accurate;
- to achieve better accuracy in forecasting, allocation should be done by major residential and employment types;
- additional research is required in the area of determining Persons Per Unit (PPU). Final assumptions regarding it should be consulted and coordinated with local municipalities;
- all major assumptions should be established in consultation with local municipalities and the consultant preparing the GTA/Peel forecasts;
- employment forecasts should be generated based on employment floor space forecasts;
- redevelopment assumptions should be researched in consultation with local municipalities;
- data on building permits and development applications should be incorporated to achieve better accuracy in short term forecasts and allocation.

Allocating Residential Units



MODEL FRAMEWORK:

- Models are designed by drawing diagrams in a type of flow chart application where the components of the model are organized into modules called 'calculators'.
- Each calculator has input and output variables.
- Model logic is coded in 'procedures'. Coding is done in a proprietary language called TOOL.
- Variables can be linked to other calculators.



MODEL COMPONENTS:

- population, dwelling units and employment specified exogenously by 100 secondary plans
- 3 types of dwelling units
- 3 types of employment
- allocation of dwelling units and employment to SGU
- land use specified by potential areas for dwelling units and employment by SGU
- 633 SGUs (Small Geographic Units)

FUTURE MODEL DEVELOPMENTS:

- Improving existing model by incorporating the ability to generate both demographic forecasting and land use allocation components.
- This new model will allow the Planning Department to continue to ensure the timely provision of most demanded forecasts by our internal (e.g. Public Works, Finance, Social Services, Health, Police, etc.) and external (e.g. school boards, community groups, local municipalities, etc.) clients.
- The outputs of the model will be important for analyzing various planning issues related to growth management.

FOR MORE INFORMATION:

Planning Department

Regional Municipality of Peel

10 Peel Centre Drive, 6th Fl.

Brampton, Ontario

L6T 4B9

Phone: (905) 791-7800 ext.4356

Fax: (905) 791-7920

Email: planninginfo@region.peel.on.ca

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