

Montpelier Growth Center Build Out Assumptions and Methodologies

The Central Vermont Regional Planning Commission (CVRPC) conducted a build out analysis using a Municipal Planning Grant from Department of Housing and Community and Affairs (DHCA). The study area was the area within the boundary of the City of Montpelier, Vermont. CVRPC was responsible for four key components:

- 1) A development potential analysis.
- 2) A parcel-by-parcel build out analysis under current zoning conditions of the proposed growth center.
- 3) Developing population and housing projection data out to 2029 for the City of Montpelier.
- 4) Assisting in the development of a proposed growth center boundary.

This document outlines the assumptions and methodologies used to accomplish these four tasks.

Assumptions and Methodologies

CVRPC staff and the Montpelier Planning Department worked collaboratively in the creation and running of the Development Potential and Build Out scenario.

The analysis began with meetings between CVRPC and representatives from Montpelier's Planning Department. From these meetings the following list of recommendations was made to CVRPC in regard to the development potential and build out analyzes:

- 1) Use a width of 50 feet to create a buffer around all streams and wetlands
- 2) Group slope percentages into four categories.
- 3) Group onsite septic system capabilities of the soils into three categories.
- 4) Use road frontage requirements as required by each zone for the build outs under current zoning conditions.

With these recommendation from the Montpelier Planning Department CVRPC moved forward with the creation of the development potential scenario using the available GIS data (Table C-6).

Development Potential

The development potential is the combination of predominately natural features. Each of these features is weighted based on its incentives or limitations to development. The Montpelier development potential includes 11 features (see Table C-1).

Table C-1. CVRPC GIS Development Potential Analysis Montpelier, VT

Land Use Development Characteristics and Scoring Factors		
Scoring Range: High > -25, Moderate = -26 to -74, Low = -75 to -199, Minimal = -200 to -1999, Conserved < -2000		
<u>Characteristic Factor (Prohibitive Constraints = -200)</u>		
Slope		
26-99%		-200
16-25%		-125
11-15%		-76
0-10%		0
Flood zone		
100 yr		-125
Wetland Buffer		
50 ft. buffer		-200
Stream and Pond Buffers		
50 ft buffer		-200
Sewer service areas		
Sewer		+25
Water service areas		
Sewer		+25
Onsite Septic System Capabilities of the Soil		
Well Suited		+25
Moderately/Marginal		0
Not Suited		-100
Conserved lands (Cons/Pub land and VLT land easements)		
Conserved lands		-2000
Primary Ag Soils		-30
Rare, Endangered Species, Municipally Significant Natural Communities		-75
Deer Habitat		-75

Build Out

CVRPC utilized ArcView 3.2 to run the Community Build Out Analysis (Version 3) developed by Addison County Regional Planning Commission. This version of the build out tool does not currently have a user manual. For more details on the steps it takes to set up a build out using this version please see Appendix A or contact the Addison County Regional Planning Commission.

The build out analyzes the area's zoning regulations, using minimum lot sizes, parcels, existing structures, and road frontage. The result is an estimate of the amount of development which could occur per parcel given current zoning conditions.

CVRPC created a build out under current zoning using all the parameters listed above and the development potential. The results of this build out (figure C-5) shows what the development capacity of each parcel is in the City of Montpelier's proposed growth center boundary under current zoning.

Table C-2 shows the districts, the use of that district in the build out, the minimum lot sizes, and the road frontage requirement.

Table C-2. Zoning Requirements for the Growth Center Build Out

Districts	Use in Build Out	Minimum Acres	Road Frontage (feet)
Central Business I (CB-1)	Mixed Residential and Commercial	0.110	75
Central Business I (CB-2)	Mixed Residential and Commercial	0.230	75
Civic District (CIV)	Commercial	0.200	75
General Business (GB)	Commercial	0.46 or 0.34	125 or 100
High Density Residential (HDR)	Mixed Residential and Commercial	0.200	40
Industrial (IND)	Industrial	2 or 1	200
Medium Density Residential (MDR)	Residential	1, 0.46, or 0.23	150, 100, or 75
Recreation (REC)	NoDev	0.000	0
Riverfront District (RIV)	Mixed Residential and Commercial	0.110	0

*For a more detail description of the Montpelier Zoning requirement please see the City of Montpelier's web site at <http://www.montpelier-vt.org/planning/index.cfm#zoning>.

The build out results are divided into four categories that depict where development can and cannot occur. The following is a list of categories and there corresponding colors used in the build out:

- 1) Parcels that are fully built out are designated by the color light purple.
- 2) Parcels that are developable are designated by the color tan.
- 3) Excluded areas are designated by the color grey.
- 4) Areas that are not developable are designated by the color green.

Figure C-4 shows the color and description of each category and Table C-5 provides a more detailed description of each category.

In addition to the computerized computation of the units, the City and CVRPC checked many of the larger parcels on the map to insure that their development potential was accurately reflected in the results. If there was an active application for new development on any of the parcels, this was taken into account. In addition, the consultant did an analysis of the units that could be added in the mixed use districts with multi-family development. The build out model does not account for multi-family possibilities, just new structures. This data was added to the build out to reflect a more complete estimate of the possible units.

Population and Housing Projection

To develop population and housing projections out to 2029 for the City of Montpelier, CVRPC utilized ArcView 3.2 to run the Community Build Out Analysis (Version 3) developed by Addison County Regional Planning Commission. This program includes a forecasting tool which allows the user to chose from ten projection methods based on the best data match. CVRPC employed both linear regression and geometric models, using both historic and forecast numbers, to project future housing and population demands for the City. A more detailed explanation of all the projection results and rationale can be found in Appendix 1 of the Montpelier Growth Center Application.

Proposed Growth Center Boundary

CVRPC assisted by the Montpelier Planning Department developed the boundary used on the maps included with this report. The boundaries extent was based on the extent of Montpelier's Medium Density Residential zone. See figure C-6 for a map showing Montpelier's current zoning and the proposed growth center boundary.

Figure C-3. Montpelier Development Potential Results

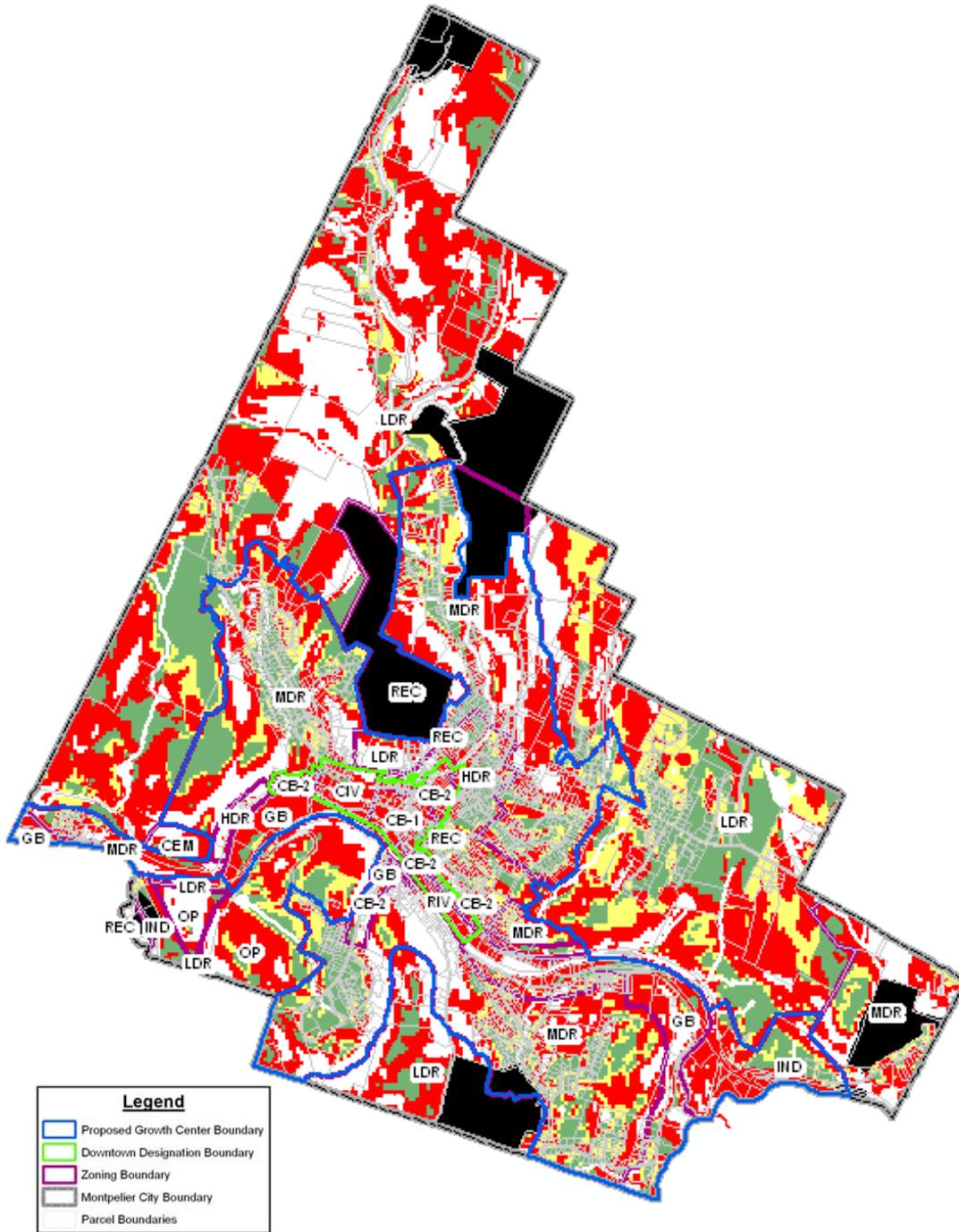


Figure C-4. Build Out Legend Example

Growth Center Build Out Road Frontage/Acres

- Parcels Fully Built Out
- Developable Parcels
- Excluded Areas
- Not Developable

Figure C-5. Montpelier Growth Center Build Out Results

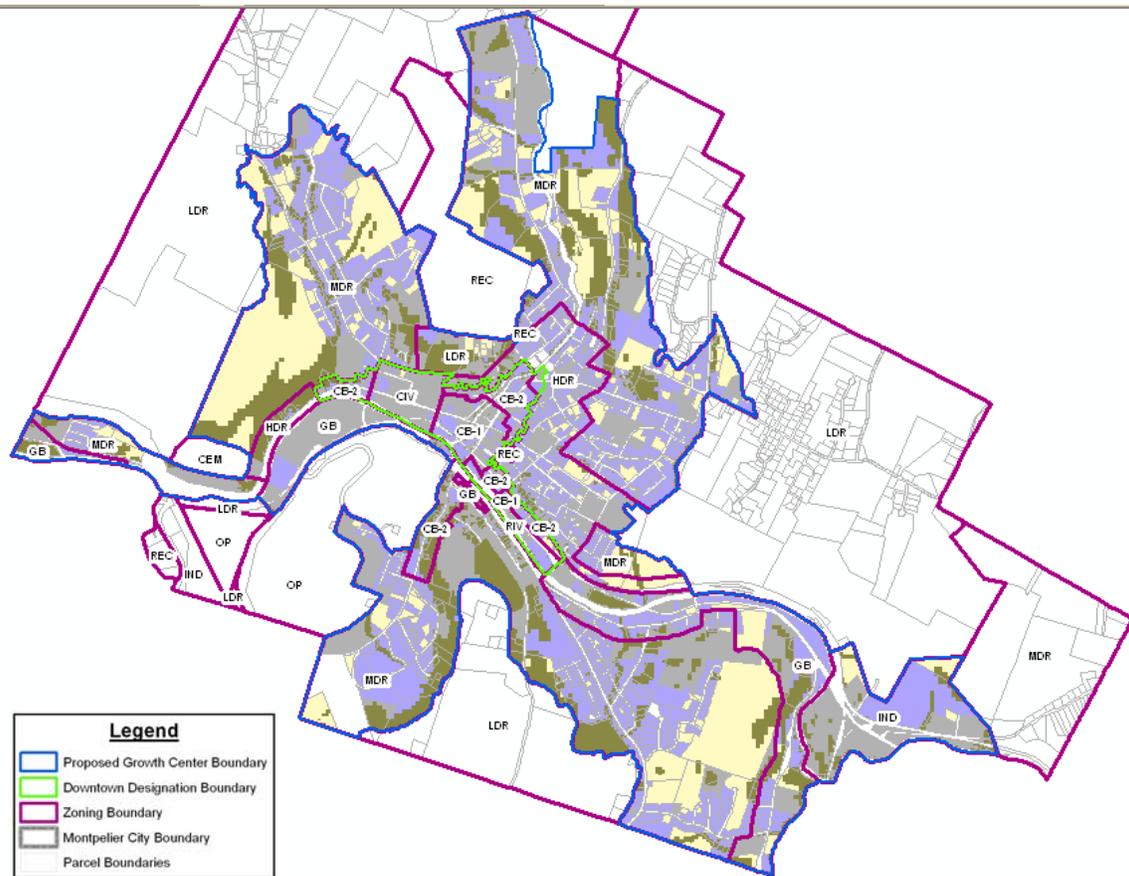


Table C-5. Build Out Legend Definitions

Build Out Potential Category	Legend Color	Code Values	Description:
Parcels Fully Built Out	Light Purple	7	This represents parcels that are fully built out. Therefore, no further subdivisions (development) can occur.
Developable	Tan	1,2, 3, and 6	This represents parcels that can still accommodate development
Excluded Areas	Gray	5,8,9 and 10	This represents areas of a parcel that don't conform to the current zoning regulations, are of a non conforming use, or is a parcel that was excluded.
Not Developable	Green	0	This represents areas of a parcel that fall partially within an area where structures cannot be located, such as wetlands, steep slopes, etc.

Table C-6. GIS Data Sources

Conserved lands: UVM Spatial Analysis Lab, 2005

Vermont Land Trust Lands: VLT, 2008

Sewer Service Area: CVRPC GIS, 2007

Flood Zone: Digitized from FEMA Flood Insurance Rate Maps – CVRPC, 1991-1993 or FEMA Q3 data.

Parcels: Montpelier, 2008

Slope: VCGI Slop 24 – CVRPC GIS, 2007

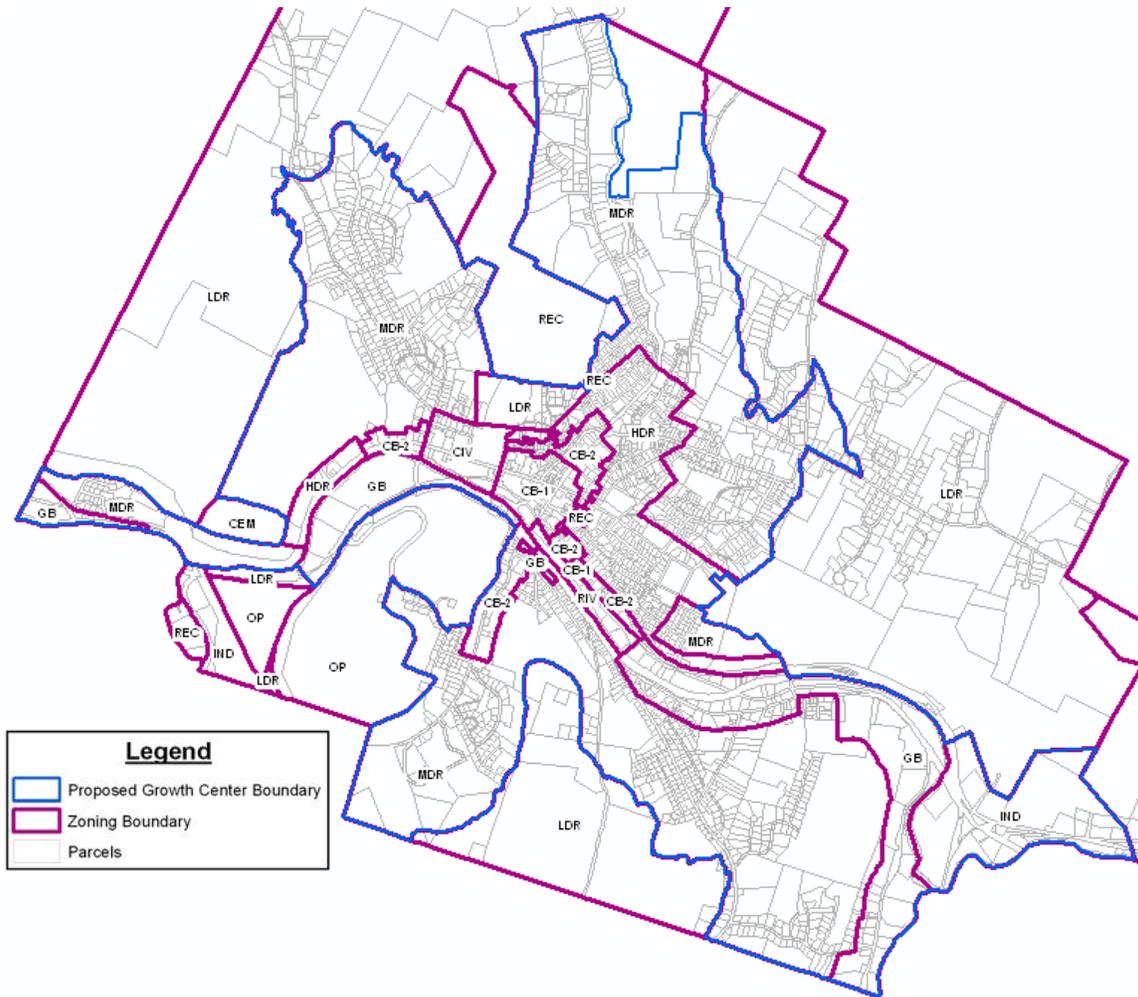
Soil: Natural Resources Conservation Service (NRCS), 2006

Stream Data for Buffer: 1:5000 Vermont Hydrography Dataset - VT Center for Geographic Information (VCGI), 2004

Wetlands Data for Buffer: 1:80000 Vermont Significant Wetlands Inventory (VSWI)- Vermont Agency of Natural Resources, 2005

Zoning – Montpelier Zoning Regulations- CVRPC, 2008

Figure C-6. Montpelier's Current Zoning within the Proposed Growth Center Boundary



Appendix A - Steps to Setting up the Build Out

This document outlines the steps that CVRPC will use to create the Montpelier Build out for its growth center application.

Two build outs will be developed using Montpelier’s current zoning, parcels, and existing structures. Build out one will be a full build out using no constraints. Build out two will be a weighted build out using constraints.

Step 1 for both build out analyzes will start with setting up the zoning file for Montpelier. During this set up the requirements for each zone will be entered. This information includes minimum lot sizes, road frontage requirements, commercial and industrial use requirements, ect.

Step 2 for both build out analyzes is to load a parcel file. The parcel file will be used to calculate the acres available for development.

Step 3 for both build out analyzes is to load the existing development. This development is broken down into 4 types including residential, commercial, industrial, and mixed com/res. This data will help determine the number of existing structures by type within Montpelier.

Themes for Existing Development and Parcel Exclusions

Definition of Existing Development

Step 1: Identify Themes Locating Existing Development and Create Criteria Tables Relating Existing Development Site Types to Uses

Residential Development
Theme for Existing Residential Development has not been registered. Click to register theme and to then create criteria table defining site types to be used in identifying Existing Residential Development. If theme is not registered Build Out analysis will assume no Existing Residential Development.

Commercial Development
Theme for Existing Commercial Development has not been registered. Click to register theme and to then create criteria table defining site types to be used in identifying Existing Commercial Development. If theme is not registered Build Out analysis will assume no Existing Commercial Development.

Industrial Development
Theme for Existing Industrial Development has not been registered. Click to register theme and to then create criteria table defining site types to be used in identifying Existing Industrial Development. If theme is not registered Build Out analysis will assume no Existing Industrial Development.

Mixed Com/Res Development
Theme for Existing Mixed Res/Com Development has not been registered. Click to register theme and to then create criteria table defining site types to be used in identifying Existing Mixed Res/Com Development. If theme is not registered Build Out analysis will assume no Existing Mixed Res/Com Development.

Step 2: (Optional) Identify Point Theme for Parcel Exclusions (Can be performed any time prior to Step 3)

Parcel Exclusions
Theme for Development Exclusion has not been registered. Click to register theme and to then create criteria table defining site types to be used in identifying Development Exclusion. If theme is not registered Build Out analysis will assume no Development Exclusion.

Step 3: Compile All 'Existing' Themes for Use in Density Analysis and Create Summary Statistics by Zoning District

Compile Existing Development
Complete registration of One (or more) themes for Existing Development has not occurred. Access to compilation/analysis of existing development prevented.

Close

Step 4 for both build out analyzes is to load the road right of way file. This file will be used by the zoning to calculate the road frontage available for development.

Road ROW Theme Definition

Shape File Name: NOT SELECTED Internal Alias Used: Road ROW

Optional Fields:

Road Type: [Dropdown] Contains "Pub" or "Pvt" as Rd Types

Road Name: [Dropdown]

Road Class: [Dropdown]

TH Number: [Dropdown] Contains Town Highway Numbers

Theme Documentation:

Source: [Text Box]

Current As Of: [Text Box]

Status: Unknown [Dropdown]

Source Scale: [Text Box]

Notes: [Text Box]

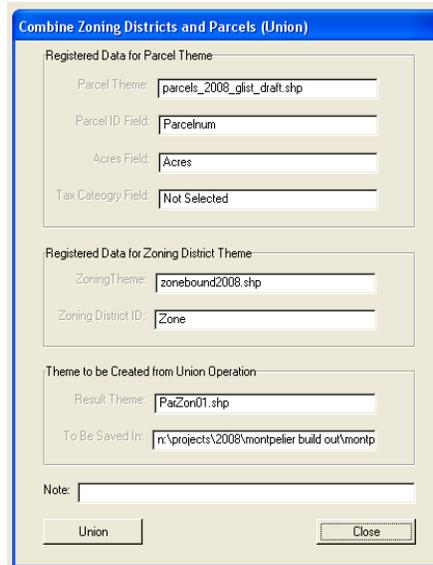
Theme Information:

Log/Audit Records: [Text Area]

Location: n:\projects\2008\montpelier build out\mont

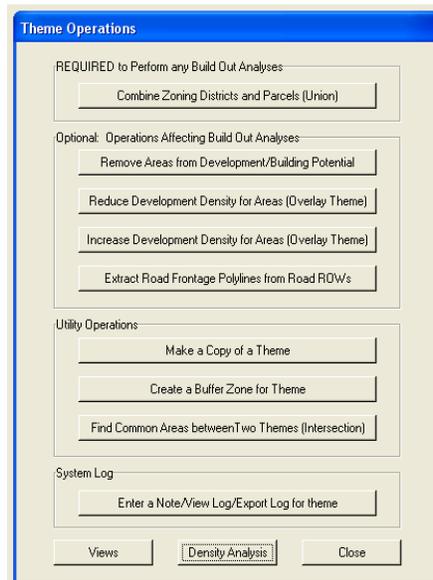
Remove Theme Select Theme Save Cancel Close

Step 5 for both build out analyzes is to combine the zoning and parcel data for build out analysis.



After step 5 the full build out moves right into step 6 while the weighted build out first moves through step 5a

Step 5a for the weighted build out is to remove and reduce the development potential of lands within Montpelier. This removal and reduction will utilize the development potential that CVRPC will create under Montpelier's guidance. See Development potential analysis methodology for more details. After the completion of step 5a the weighted build out will move onto step 6.



Step 6 is to run the density analysis and calculate the potential residential, commercial, and industrial development by zone within Montpelier. The results from this step will be used to develop the growth center boundary.

Density Analysis Operations

REQUIRED Operations

ALWAYS run steps in the order indicated. DO NOT re-run steps; ALWAYS restart at Step 0. Use log displayed on individual dialogs to verify steps run.

Step 0: Pt Theme identifying Excluded Parcels not registered.

Step 1: Creates PazZorXXComp by compiling data to a parcel zone level with separation between developable, no development and no build areas.

Step 2: Road Frontage data not available.

Step 3: Assigns Planning Use associated with Zoning District to polygons (Parcel Areas).

Step 4: Existing Development theme has not been created. Main Dialog -> Themes -> Existing Development -> Step 3

Step 5: No Zoning districts are assigned Mixed Residential/Commercial Use.

Residential Development

Step R2:

Step R3 (Optional: Points for Visual Representation):

Commercial Development

Step C2:

Step C3 (Optional: Polygons for Visual Representation):

Industrial Development

Step I2:

Step I3 (Optional: Polygons for Visual Representation):

Perform all steps in the order indicated with required steps performed first. Then, perform steps in order for Residential, Commercial or Industrial as required.

Step 7 is to calculate the population projections for Montpelier. Please note that population projections can be calculated at any time and do not rely upon the completion of the build out analysis.

Calculate Population Projections

Enter and Save data in the order indicated in the following panels: 1 -> 2 -> 3 -> 4.

1. Set Criteria: Base Period, Year to Project to, Interval and Upper Population Limit

Base Start Year: Base End Year: Project Population To Year:

Interval (No. Years): Upper Population Limit:

2. Set Historical Population Data for Base Period

3. Calculate Population Projections, Review Projections and Review Errors Associated with Projection Methodology

A dialog will be displayed in response to clicking the button labeled Review Projections. Each column will list the population projection for a given methodology. The column names associated with a methodology are identified in parentheses in the panel below.

4. Select Method to be used for Population Projection

Linear Regression (LinearReg) Gompertz Curve (Gompertz)
 Geometric (Geometric) Gompertz Curve (Upper Limit, GompertzLm)
 Parabolic Curve (Parabolic) Logistic Curve (Logistic)
 Modified Exponential Curve (ModExp) Logistic Curve (Upper Limit, LogisticLm)
 Modified Exponential Curve (Upper Limit, ModExpLm) User Supplied Population Projections