Exercise: Prepare for your analysis

In this exercise, you will perform an analysis that locates the best sites for a new wastewater treatment plant. You will perform the following tasks:

Create a custom toolbox.

Create a model.

Create a query for use in your analysis.

You will also answer some typical questions about the analysis you are about to perform. The exercise is divided into shorter exercises, but they all represent a single workflow.

As you've already learned, it is good practice to plan your analysis before you actually start building your model. This way, you deepen your understanding of what you have, what you need, and what you want to accomplish with the analysis. Planning ahead will decrease the chances of discovering later on that you do not have all the data you need to perform an analysis.

Earlier, you learned about the importance of various questions to consider before building a model.

Questions to consider before building a model
What is the goal of the model you want to build?
What data do you need to use in the model?
What is the most effective workflow to follow to achieve your goals?

All site-selection analysis operations have criteria that are specific to your situation—a storefront, a park, a treatment plant, and so on. In this case, your criteria for siting a new wastewater treatment plant are as follows:

Must be within 3,000 feet of the Cache la Poudre River

Must be within 1 mile of the city limits

Must be at least 300 feet from residential parcels and parks

Must lie outside the flood plain

Must be on vacant parcels that are 50,000 square feet or greater

Estimated completion time: 15 minutes

To complete exercises, you need the following:

ArcGIS Desktop 10.0 or ArcGIS Desktop 10.1 or ArcGIS Desktop 10.2 (Advanced)

Note: This course contains four exercises. An Advanced license of ArcGIS for Desktop is required to complete two course exercises. An ArcGIS for Desktop Basic or Standard license can be used to complete the other course exercises.

Step 1: Download the data

To complete the exercise, you must download the data. If you have already downloaded and installed the data, continue to the next step.

Step 2: Plan your analysis

In this step, you will explore the data you have available to you in the FtCollins geodatabase and then use this data in the model.

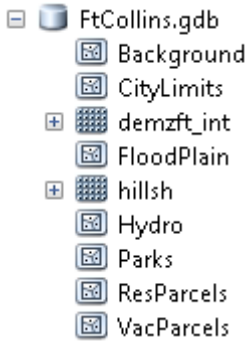
Based on what you know about this exercise, what is the goal of this model?

Start ArcMap.

If necessary, open the Catalog window .

Expand the folder connection to the BldgModels10_0 folder.

Expand FtCollins.gdb to view its contents.



Step 2a: Plan your analysis.

Notice that there are several feature classes and raster datasets in this geodatabase.

The last question to consider concerns the workflow and tools. You need to locate things within certain distances of other things. Look at the criteria and try to determine what is actually occurring. For example, the plant must be within 1 mile of the city limits. This requirement creates a 1-mile zone on either side of the city boundary, and if parcels fall within that boundary, they are initially suitable (although they may not meet the rest of your criteria).

You will use the Buffer tool to fulfill the following criteria:

Must be within 3,000 feet of the Cache la Poudre River

Must be within 1 mile of the city limits

Must be at least 300 feet from residential parcels and parks

? How would you locate vacant parcels that are greater than 50,000 square feet in area?

Now that you have gathered some information and have a better idea of your workflow, you will move forward with creating your model.

- Step 3: Create a new custom toolbox and model

From the Catalog window in ArcMap, open **..\Student\BldgModels10_0\SitePlant.mxd**.

Set the default geodatabase to FtCollins.gdb.

Remind me how

Right-click FtCollins.gdb in the Catalog window and choose Make Default Geodatabase.

Note: Setting the default geodatabase is similar to setting the application-level environment for current workspace: it is applied to all tools. In this case, all derived data will be stored in FtCollins.gdb.

Right-click FtCollins.gdb and choose New > Toolbox.

Name the new toolbox **Site_Plant**.

Right-click the new toolbox and choose New > Model.

A blank new model opens.

From the Model menu, choose Model Properties.

On the General tab, set the following properties:

Name: **WastewaterSiteSel**

Label: **Wastewater Site Sel**

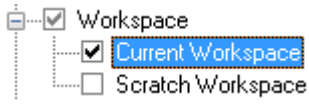
Check the box to store relative path names.

Note: You should use relative paths. If you share your model with another user, the model's root folder would not need to be the same for the model to run properly.

Click Apply.

Click the Environments tab.

Scroll down to Workspace, expand it, and then check the Current Workspace box.



Step 3a: Create a new custom toolbox and model.

Click Values and expand Workspace.

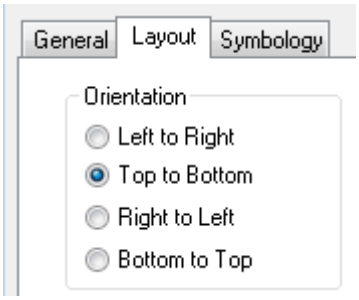
The Current Workspace environment setting is already set to the course folder because you have set the default geodatabase. Setting the default geodatabase is similar to setting an application-level environment for a current workspace. It will be applied to all tools you run, unless you override it by setting a tool, model, or model-process environment setting.

Click OK on all dialog boxes.

From the Model menu, choose Diagram Properties.

Models are commonly built using the default layout of left to right. In some cases, building them from top to bottom is useful because you can see more of the ArcMap display with a vertical orientation. Models constructed vertically run the same way other models do.

Click the Layout tab and choose Top to Bottom.



Step 3b: Create a new custom toolbox and model.

Click OK, save the model, and minimize it.

Step 4: Select a feature using a query

Now you will select the Cache la Poudre River as the main water feature for your analysis. Because all geoprocessing tools honor selected sets, you can simply make a selection rather than creating new data containing only the river. This operation will help you fulfill the criterion of close proximity to the river.

Press the Ctrl key and then uncheck any layer name to turn off all layers.

Turn on the Hydro layer only.

From the Selection menu, choose Select By Attributes.

Change the Layer to Hydro.

Build the following expression: `NAME = 'Cache La Poudre River'`. (**ArcGIS 10.0 or 10.1 users:** Build this expression: `"NAME" = 'Cache La Poudre River'`.)

Remind me how

Change the Layer to Hydro and then double-click NAME, click the equal (=) sign, click Get Unique Values, and double-click 'Cache La Poudre River'.

Click OK to make the selection.

Now the Cache la Poudre River is selected in the map.

Step 4a: Select a feature using a query.

Hold down Ctrl on your keyboard while you click an unchecked layer's check box to turn on all the layers again.

Save your map.

If you plan to immediately continue to the next exercise, leave ArcMap open. Otherwise, close ArcMap.