Exercise 4 – Using Subtypes

Session Objectives: At the conclusion of this session, you will be able to:

- ❑ Create a project specific geodatabase using a structured framework.
- ❑ Integrate subtypes into the geodatabase to shorten long attribute domain lists.

Material Created By: Eric Kelchlin, June 2011

Revision: January 2012

Software: ArcGIS 10, SP3

Path: D:\CSP7301\Exercise4

Tables: Exer4_Domains.xlsx, Exer4_GDB_Form.xlsx

GDB: Created with this exercise

Please read the project summary below to get familiar with the project.

Title: City Park Infrastructure Mapping Project

Requested by: Florida Park Service

Problem Statement:
The Florida Park Service is writing a master park management plan for the city but lacks the base data on existing park facilities to conduct a proper assessment. Christy McNichole, the Park Planner, knows that this will be a huge endeavor to inventory all the parks facilities, so she wants to focus on Recreation Areas, Visitor Comfort Amenities and Transportation features for the interim. The remaining park facilities will be inventoried once the process steps and bugs are worked-out for these features of concern. The Service requires that the data be stored in a file geodatabase format (.gdb) and must be populated with relevant attribute domains. They would also like to generate a detailed map showing the location of all the Active Recreation Areas and Visitor Comfort Amenities.

Project Objectives:
1. Map the parks Active Recreation Areas, Amenities, and Transportation features.
2. Create metadata documenting your data collection methodology.

Existing Data: D:\CSP7301\NCTC\Imagery\NAIP_2010.img
D:\ CSP7301\Exercise4\Tables\Park.xlsx

Methodology:
1. Create a file geodatabase with Transportation (line), Recreation (polygon) and Structure (point) feature classes.
2. Create domains (i.e., drop-down pick-lists) to speed-up data collection.
3. Collect the data with ArcPad 10 on a Trimble GeoXM GPS receiver.
4. Create metadata using the project summary as a reference.

Deliverables:
1. A file geodatabase with feature classes, domains and metadata.
2. A map document (.mxd) and detailed map printed on a large format printer.

TASK 1 – Create the Geodatabase Structure

This exercise builds-off what you learned from the pre-course assignment on geodatabase design. The steps are more generalized as a result. However, the new material on subtypes will be presented in more detail.

Unless stated otherwise, all data are located in D:\CSP7301\Exercise4.

1. Remove the **Geodatabase Design Forms** in the back of this exercise. This completed form will be used in the following sections as a structural design template.

2. Open ArcCatalog .

3. Right-click on the **Exercise4** folder and create a **New > File Geodatabase**. Name the geodatabase **Park_Project.**

4. Right-click on the new geodatabase (the can) and create a **New > Feature Dataset**. Name the feature dataset **Infrastructure**.

5. Assign the **NAD83, UTM Zone 17** datum and projection to the feature dataset. Use "none" for the vertical datum.

6. Right-click on the **Infrastructure** feature dataset and create a **New > Feature Class**. Name the feature class **Transportation**. Make sure the data type is a Line feature.

7. Following your geodatabase design form, create the **Transportation** feature class fields. Add the default values but ignore the Subtypes for now they'll be added in the next section. Keep the "**Yes**" in the **Allow NULL Values** field. Change the text field size in the field properties section as listed on the data form.

8. Next, create the **Recreation** Polygon feature class, but when you get to the blank fields screen, select the **Import** button towards the bottom of the screen. Browse to the **Transportation** feature class you just created. Click Add or double click.

9. Delete the all the fields except for Date, GPS_Device and Park_Name. Add in the new fields as shown on your form. Click Finish when done. You can import feature classes or tables to use as templates to speed things along.

10. Create the **Structures** Point feature class. Import the fields from the feature class you just created. To save time, simple keep the first three fields, delete the rest, and create the remaining three new fields on as listed on the data form.

STOP HERE!

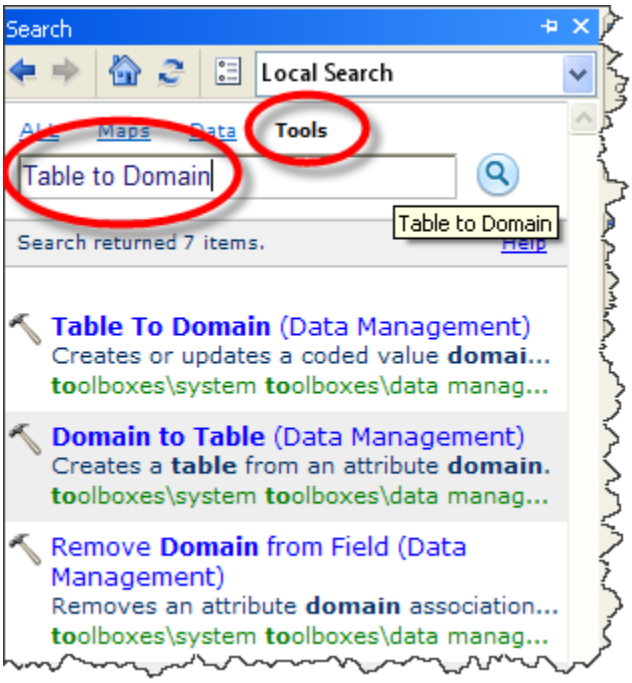
TASK 2 – Import the Domains

According to our data forms we need to add 9 domains to our geodatabase.

1. Open the **Exer4_Domains.xlsx** Excel file and familiarize yourself with the attributes on each of the worksheets.

2. Close Excel.

3. Import the worksheets into the geodatabase using the Table to Domain Tool. Use the new **Search** tool in ArcCatalog to locate and initiate the Table to Domain Tool.

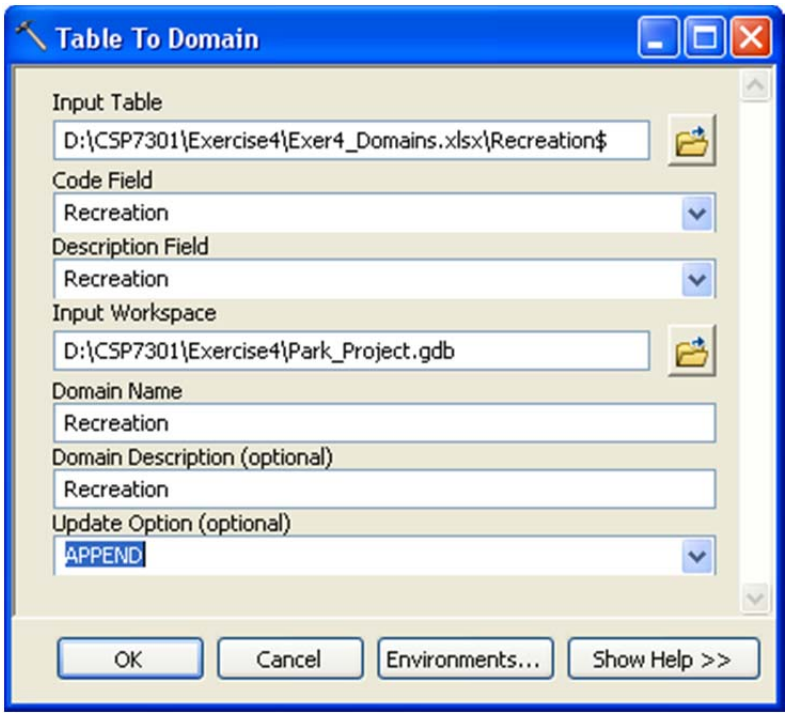


4. Follow the following guidelines when using the Table to Domain Tool:

   - The **Code** and **Description** fields will be the same for each domain. Be careful, since we have multiple domains (i.e., lists) in the worksheets.

   - The input workspace will be the **Park_Project** geodatabase.

   - Make sure the Domain Name is the same as that listed on the subtype data form.



5. Right-click on the **NCTC** geodatabase, select **Properties** and the **Domains** tab to verify that the domains were successfully imported.

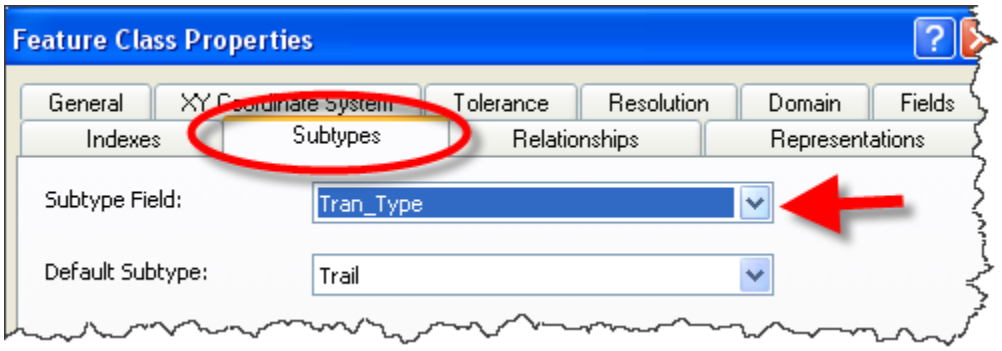
TASK 3 – Create Subtypes, Assign Domains and Add Default Values

A subtype is used to assign multiple domains to a single data field. This can be very useful if you have a long list attributes or you only want specific values to be available in a given geographical area or seen by certain field technicians.

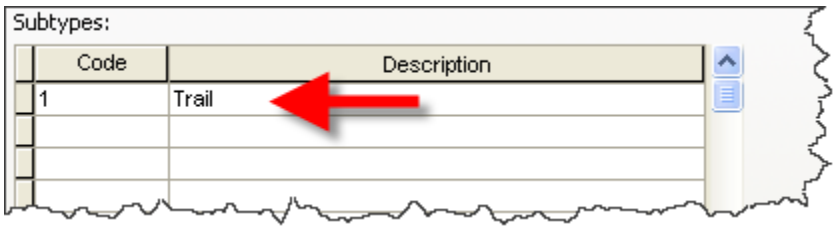
1. To create a subtype, simply right-click on the **Trans_Type** feature class and select **Properties**.

2. Click on the **Subtypes** Tab.

3. Select **Trans_Type** from the drop-down list in the Subtype field. This is the only integer data type field in the feature class, so it's the only field available. Subtypes must be integers.



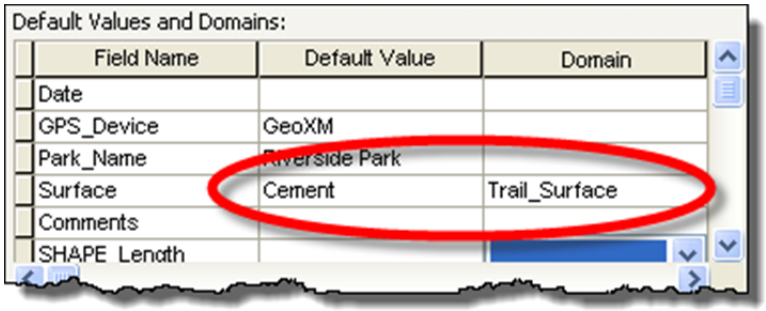
4. In the Subtypes section, type **1** in the **Code field** and **Trail** in the **Description** field.



5. Next, assign the **Trail_Surface** domain to the **Surface** field in the Default Values and Domains section.

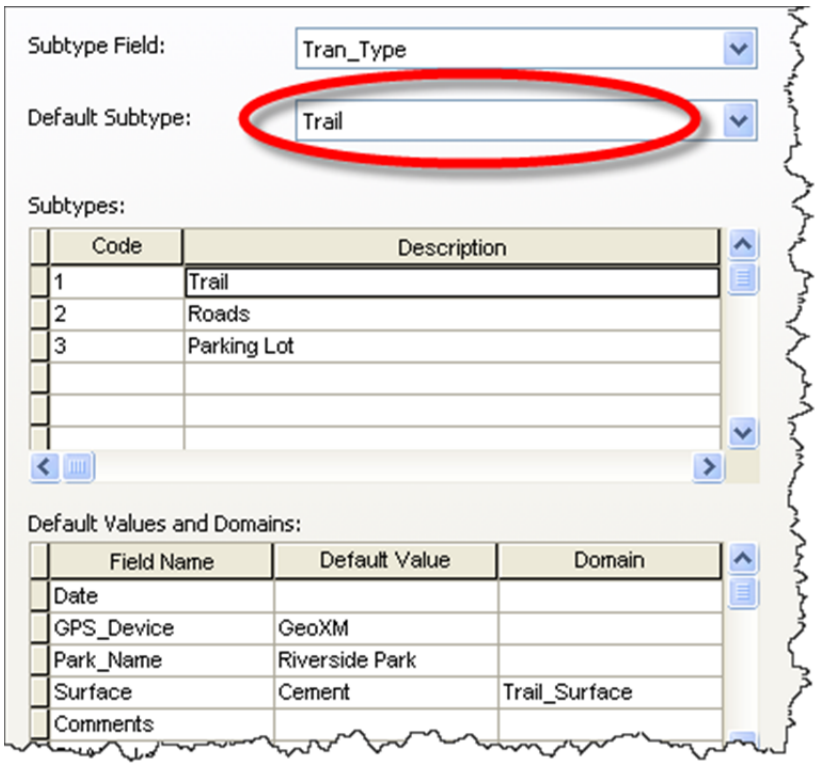
6. Type **Cement** in the Default value field next to the **Trail_Surface** Domain.

7. Click Apply to accept the changes.



8. Next, create the **Roads** and **Parking Lot** subtypes and assign the appropriate domains and default values as listed on the subtypes data form. Click [Apply] to accept the changes after each subtype.

9. Keep the **Default Subtype** to as **Trail.** Click [Apply] and **OK**.



10. Create the subtypes and assign domains for the remaining two feature classes as listed on the subtypes data form. Use **Recreation** as the default subtype for the **Recreation** feature class and **Signs** as the default subtype for the **Structures** feature class.

11. Don't forget to assign the default values for **GPS_Device** and **Park_Name** fields!

STOP HERE!

TASK 4 – Test the Subtypes and Domains

1. Close ArcCatalog and Open ArcMap

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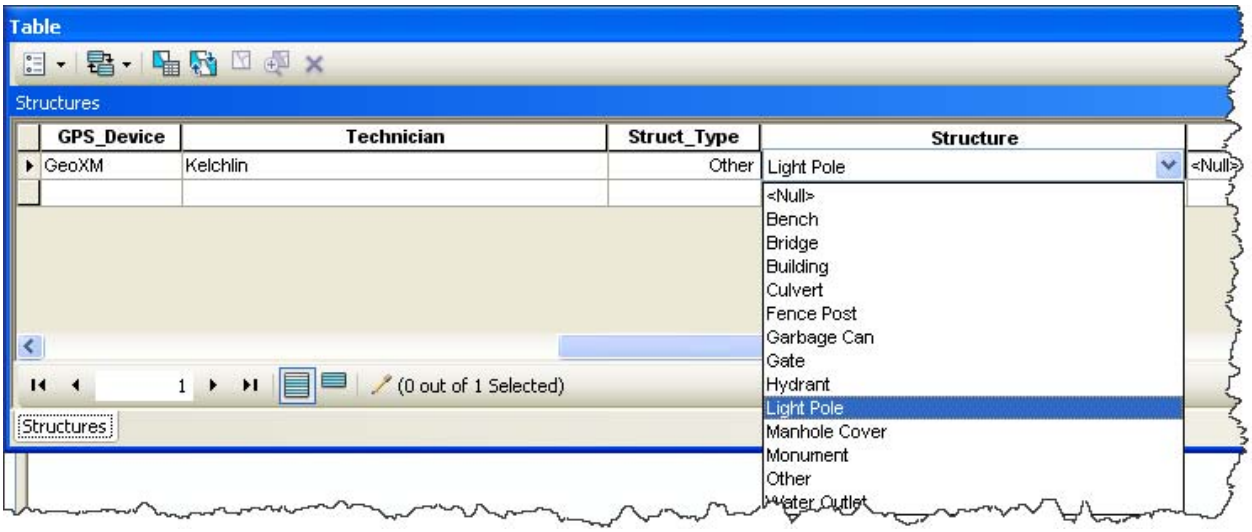
2. Open a New Blank Map and change your default geodatabase to **Park_Project.gdb**.

3. Add the **Infrastructure** feature dataset. Start and editing session. Notice how the subtypes are already shown in the Table of Contents.

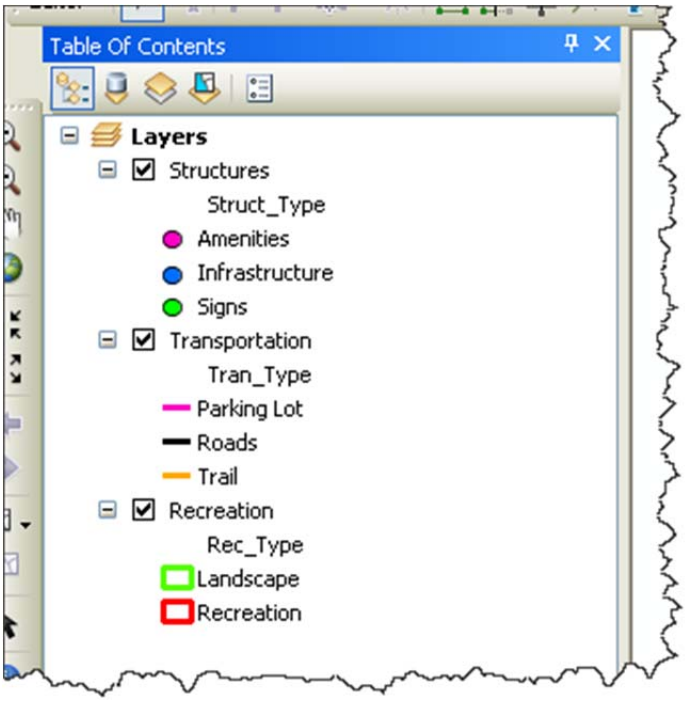
4. Open the attribute table for each feature class. Double-click on an empty record cell and make sure subtype switch field and domains are working properly.



5. Proceed to the next task if everything checks out. Otherwise, exit ArcMap without saving your edits and fix any errors in ArcCatalog. Test the subtypes and domains again before proceeding to the next task.

TASK 5 – Check Out the Geodatabase for Field Use

1. Change the symbology so that the layers are visible in the field.



2. Add the imagery and zoom to the Riverside Park area (as the instructor where it is on the imagery).

3. Save the Map document. Name the document **Day2.mxd** and save it in the **Exercise4** folder.

4. Follow the check-out process as illustrated in Exercise 1. However, do NOT include the imagery this time. Save the ArcPad document in the **Exercise 4** folder.

5. Transfer your ArcPad project over to your GPS device and make sure it's on the unit before we head-out into the field.

Geodatabase Design Form

Feature Class or Table Name	Data Type	Field Name	Field Type	Text Length	Domain Name	Default Value
Transportation	Line	Date	Date			
		GPS_Device	Text	10		GeoXM
		Park_Name	Text	35	Park_Names	Riverside Park
		Tran_Type	Short Int			
		Surface	Text	35		
		Comments	Text	40		
Recreation	Polygon	Date	Date			
		GPS_Device	Text	10		GeoXM
		Park_Name	Text	35	Park_Names	Riverside Park
		Rec_Type	Short Int			
		Recreation	Text	35		
		Comments	Text	40		
Structures	Point	Date	Date			
		GPS_Device	Text	10		GeoXM
		Park_Name	Text	35	Park_Names	Riverside Park
		Struct_Type	Short Int			
		Structure	Text	35		
		Comments	Text	40		

Subtype Design Form

Feature Class	Switch Field	Sub-Types	List Field	Doman Name	Default Value
Transportation	Tran_Type	**Trail**	Surface	Trail_Surface	Cement
		Roads		Road_Surface	Asphalt
		Parking Lot		Parking_Surface	Asphalt
Recreation	Rec_Type	**Recreation**	Recreation	Recreation	Tennis Court
		Utilities		Landscape	
Structures	Struct_Type	**Signs**	Structure	Signs	Interpretive
		Amenities		Amenities	
		Infrastructure		Infrastructure	Light Pole