CADD/GIS Interoperability

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Guidelines

CADD/GIS Interoperability is the concept of building/populating a FDOT CADD file in a format that is GIS friendly. GIS friendly means that the elements in the CADD file will consist of Lines, Curves and closed shaped polygons that have native Bentley Map feature attributes attached. In order for these elements and their associated attributes to be useful to the consumers of this data, they will have to meet the needs of the consumers. Theoretically, there are a wide variety of consumers that could use CADD data stored in FDOT CADD files that the department pays employees and consultants to create. As software evolves to take advantage of feature-based elements, designation of CADD elements for GIS consumers will become easier and more prevalent. However, for the purpose of this particular project the focus will be on a narrow band of CADD Elements and a narrow band on consumers these elements will serve. Once the concept has evolved to a proven state the number of CADD Elements and therefore consumers will increase.

This project will proceed in two parts guided and implemented by Central Office Surveying and Mapping in cooperation with the Engineering CADD Systems Office (ECSO). Part 1 will concentrate on training and then accumulating feedback based on the knowledge, skills and abilities of the District Surveying and Mapping Offices. Part 2 will concentrate on training and then accumulating feedback based on the knowledge, skills and abilities of the District and Central Office GIS departments. The Surveying and Mapping offices and the GIS departments both have knowledge, skills and abilities that are unique to their respective areas of expertise and input will need to be collected from each. The workflow will generally proceed like this; Right of Way Mapping will generate GIS friendly CADD files. GIS will import these GIS friendly CADD files into a GIS database and present it in a form that will be useful to the consumers.

It is crucial to the success of this project that District & Central Office Right of Way Acquisition, District Surveying and Mapping offices and District GIS participate and give feedback to Central Office Surveying and Mapping. Feedback will need to be critical but positive and it will need to be focused on the project goals. We need your experience, your insight and your creativity. No idea will be discarded without careful consideration.

For the implementation of this project, a couple of overall guidelines need to be established.

One, there are potentially two sets of customers that could be served by right of way mapping data exported to a GIS. These customers could be internal to FDOT or external to the public. This project will initially serve internal to FDOT customers. However, it is possible that eventually it will serve the public at large so keep in mind that possibility when developing the products and attributes.

Two, right of way mapping data exported to a GIS could be used by internal FDOT customers during the acquisition phase of a right of way mapping project or after the acquisition is complete. For the purpose of this project, the products generated will be transmitted to GIS after acquisition is complete.

The complexities of trying to accommodate the dynamic processes of right of way acquisition are beyond the scope of this project. Keep in mind however, that a future project may expand the usage of GIS to the acquisition process.

Below are the project goals and the product development processes. Please review the processes, concentrating on file handling techniques, graphical representations and attribute usefulness.

Project Goals

Right of Way Mappers are uniquely qualified to build graphical CADD files that contain geo-referenced lines, curves and polygons that are mathematically accurate based on the Florida Professional Surveyors and Mappers' (PSM) policies, procedures, guidelines and rules. Furthermore, as a result of their normal workflow Right of Way Mappers will have at their fingertips, title searches, commitments and recording data. In addition, Right of Way Mapping is responsible for mapping changes in property rights and usage for the department. This includes but is not limited to determinations of what is right of way and what is surplus property, orders of taking, fee title transfers, temporary and permanent easements, license agreements, jurisdictional transfers and in some cases documented agreements like memorandums of understandings for maintenance purposes. Right of way mapping also incorporates elements of engineering design data into the map to harmonize with and complement construction plans. This type of data will also prove valuable to customers inside and outside of FDOT. Utilizing this expertise and the associated work efforts in a way that can be published through a GIS system will ensure the success of this project.

The goal of this project is to determine what products listed above are needed for customer usage in a GIS System and what attributes should be included with the products that will serve the customers' needs. Be open minded, products and attributes that are not important to you may be extremely useful to others. At the same time, we do not want to load up the GIS with extraneous data for data's sake. The products and associated attributes must be deemed useful to downstream customers or it will be eliminated.

Workflows will differ in some ways between districts but we must build a process that is useful to all. Remember we are one DOT, one Team. We will be divided into distinct groups, giving and receiving feedback but we are not competing. Working together and reaching a consensus will also ensure the success of this project.

CADD Product Development Process (Part 1)

For the purposes of this project, the number of products should be limited to an amount that is manageable. For this reason, we have initially chosen three types but are open to others as long as they do not complicate this process in a way that would jeopardize the timing and success of this project. Also, note that the way the products below are described and developed are open to change based on team recommendations. These processes are intended to be an example of how this could be done and are open for discussion. Each product will have a standard file name following the current standard file naming convention as per chapter 5.3 of the CADD Production Criteria Handbook. Because each file name from project to project is not unique, it is crucial that all products be organized by project. Once standard file names (see Appendix A) have been defined, QC Inspector (software used to check CADD element compliancy) will be revised to accommodate the GIS deliverables. Therefore, all elements within a product file must meet CADD standards that will be establish for the purposes of this pilot project. These files will be considered critical files and must achieve 100% compliancy in order to import properly into the GIS database. Once the products are finalized, they will become a statewide standard and must be submitted as a deliverable for all new right of way mapping projects.

The types of products are listed below:

I. Alignments

The alignment will generally be the Centerline Construction and associated ramps and side streets. If the Baseline Survey also exist separately and is referenced we need to consider the pros and cons of both being imported into the GIS. Precedent should be given to the alignment that is referenced and used for stationing on the right of way map. In some cases, the only available alignment may be a digitized line. This would be acceptable however; we would need to make sure that it along with all other alignments is properly described with an attribute for clarity. At this point, we have few attributes for the alignment so please submit ideas based on possible customers and their needs. The product should consist of a single complex chain or polyline as much as possible and then separate polylines for ramps and side streets. At this time baseline stationing will not be imported into GIS. One possible source of this line is the project ALGNRD.dgn file(s). All associated alignments for a project should reside in a single file. The file should have a standard file named GISALGN##.dgn, where the "GISALGN" is the standard file name and the ## represents a two digit number in case multiple files need to be built.

II. Right of Way Lines

Right of way lines should be mostly straightforward. At this point, the idea is to show the extent of all FDOT rights of way within the project limits after acquisition. Do not show local and county right of way lines. This may create gaps in some areas along side streets; however, these gaps will highlight the possible need for jurisdictional transfers when viewed

in GIS. A Right of Way line should consist of a single complex chain or polyline as much as possible. The right and left right of way line will be separate polylines and of course, gaps will cause some right of way lines to be created as separate polylines. It is not practical to try to show existing FDOT right of way as a polygon because too many assumptions would have to be made to complete a polygon. At this point, we have very few attributes for the right of way line so please submit ideas based on possible customers and their needs. All right of way lines for a project should reside in a single file. The file should have a standard file named GISRWDT##.dgn, where the "GISRWDT" is the standard file name and the ## represents a two digit number in case multiple files need to be built. This file should be substantially similar to the project RWDTRD.dgn file, right of way detail for Roadway Design.

III. Parcels

Parcel Takes will take the form of closed shaped polygons. Each take (parcel number) and the associated parent track will need to have a separate complex shape or polygon created in order to assign unique attribute data for that take/parent track. If the parent track is too large to practically build a polygon, use the abbreviated parent track that appraisal requires. If there are separate takes with the same parcel number (i.e. PART or PART A, B, C, etc.) from the same owner a separate polygon must be created for each. The attribute data is associated with the specific polygon not the parcel number therefore separate takes from the same owner will not be a problem. At this time, we are including the parent track and all takes as parcel products. This includes temporary easements and license agreements. We understand that some of you may not see the need for tracking temporary easements and license agreements and even the parent track however; in our preliminary investigation, some districts have expressed a need to include these polygons. Therefore, we are not throwing out anything until a consensus is reached. We ask that you participate in good faith in order to give an accurate accounting of what is needed and what is not. An easement expiration date for instance, could be an attribute that is automatically flagged from the database on the date of expiration and programmed notifications could automatically be sent to GIS/Right of Way Mapping for revisions. Date sensitive notifications could benefit a wide range of customers. In our preliminary testing, it became apparent that each parcel take would need to reside in a separate file. The recommendation is to include the parent track in the fee take (100s) file if there is one however, the parent track can reside within any of the associated take files for that owner but only needs to be created once. Multiple takes (PART) from the same owner should all reside in a single take file. Each take file should have a standard file named GISPAR###.dgn, where the "GISPAR" is the standard file name and the ### represents the parcel take number. Just as important as a geometrically accurate and georeferenced polygon, are the parcel attributes. Feedback from all of the disciplines referenced in the above guidelines will be requested on parcel attributes and a careful consideration will be given to all suggestions. A set of sample attributes have been developed from preliminary interviews with district mapping, surplus property and right of way acquisition. These attributes are preliminary and are subject to change based on your testing

and recommendations. At this time, there are only one set of attributes that will apply to all parcels and the parent track. It will be incumbent on the right of way Mapper to fill out known attributes prior to submittal. Leave the others blank.

IV. GIS Master File

The GIS master file is simply a master file that all the other products can be referenced into for ease of import to GIS. GIS can import all products simultaneously from the GIS master file. In addition, the GIS master file provides an overall view of the project for visual inspection. The standard file name for the GIS master file is GISMASTER.dgn

> After a product is completed, it should be referenced into the GIS master file and the GIS master along with all available reference files would then be transmitted to GIS. The initial recommendation is to populate the project folder structure in the Technical Information Management System (TIMS). This GIS folder would be dedicated solely for retaining completed GIS product files. Completed files will be saved in TIMs and when a revision is made to an existing product, replace the existing file with the revised file. A letter of transmittal to the appropriate GIS entities could notify them that products are ready for import. Due to the dynamic nature of right of way acquisition, not all products will be deposited in the GIS folder at the same time. For example, the alignment (GISALGN01.dgn) could possibly be added very early if not first and the Right of Way lines file (GISRWDT01.dgn) may be the last file that is added to TIMS.

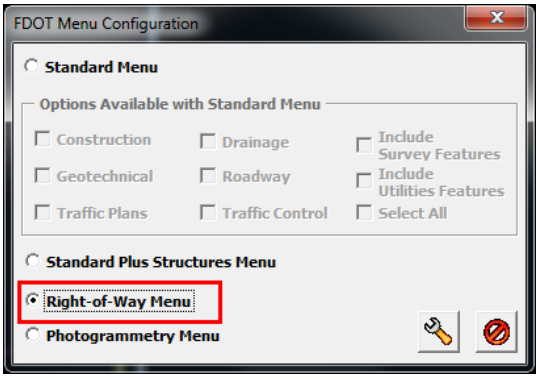
Bentley Map GIS Product Creation

Power GEOPAK V8i (Select Series 2) has been deployed in conjunction with FDOTSS2 and includes Bentley Map. Bentley Map is a fully featured geographic information system and therefore has the capability of attaching preset attributes to MicroStation elements. Therefore, this project takes advantage of currently licensed products by the department. The Central Office Surveying and Mapping GIS section in cooperation with the Location Surveying and Right of Way Mapping Section has created a workspace within FDOTSS2 that will accommodate the creation of MicroStation element GIS features with preset attributes. This workspace has been included in the FDOTSS2 MR1 that was released on February 14, 2014. Note that the DGN file serves as the database for Bentley Map. All GIS data is contained within the DGN file.

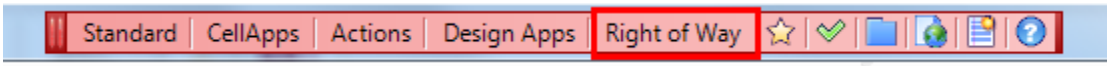
Activating Bentley Map

To activate Bentley Map and have the preset resource files available to build the products described in this project, open FDOTSS2 MR1 in the Right of Way Mapping configuration. The FDOT Menu Bar will show as a menu option “Right of Way” when the right of way mapping configuration is active. To activate Bentley Map in the MicroStation menu bar select “GEOPAK” to open the drop down menu and select “Activate Map” at the bottom of the drop

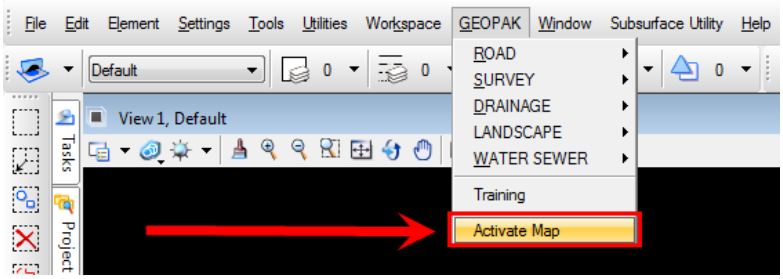
down menu. Once Bentley Map is active, a new menu option “Feature” will be available to create GIS features.



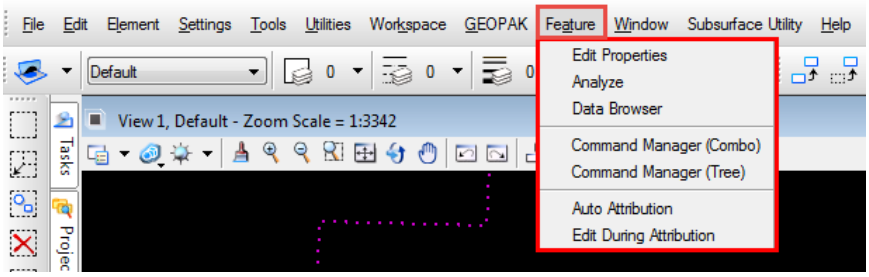
The “Right of Way” FDOT menu bar configuration:



Activate Bentley Map:



The “Feature” menu will enable the user to create Bentley Map GIS features.



Under the Feature menu, there are two versions (Combo and Tree) of the “Command Manager”. Both do the same thing and the difference is only in the format of the command manager dialogue box. Once activated either version of the command manager can be docked for convenience. In the examples below the Command Manager (Tree) will be used to create GIS featured elements.

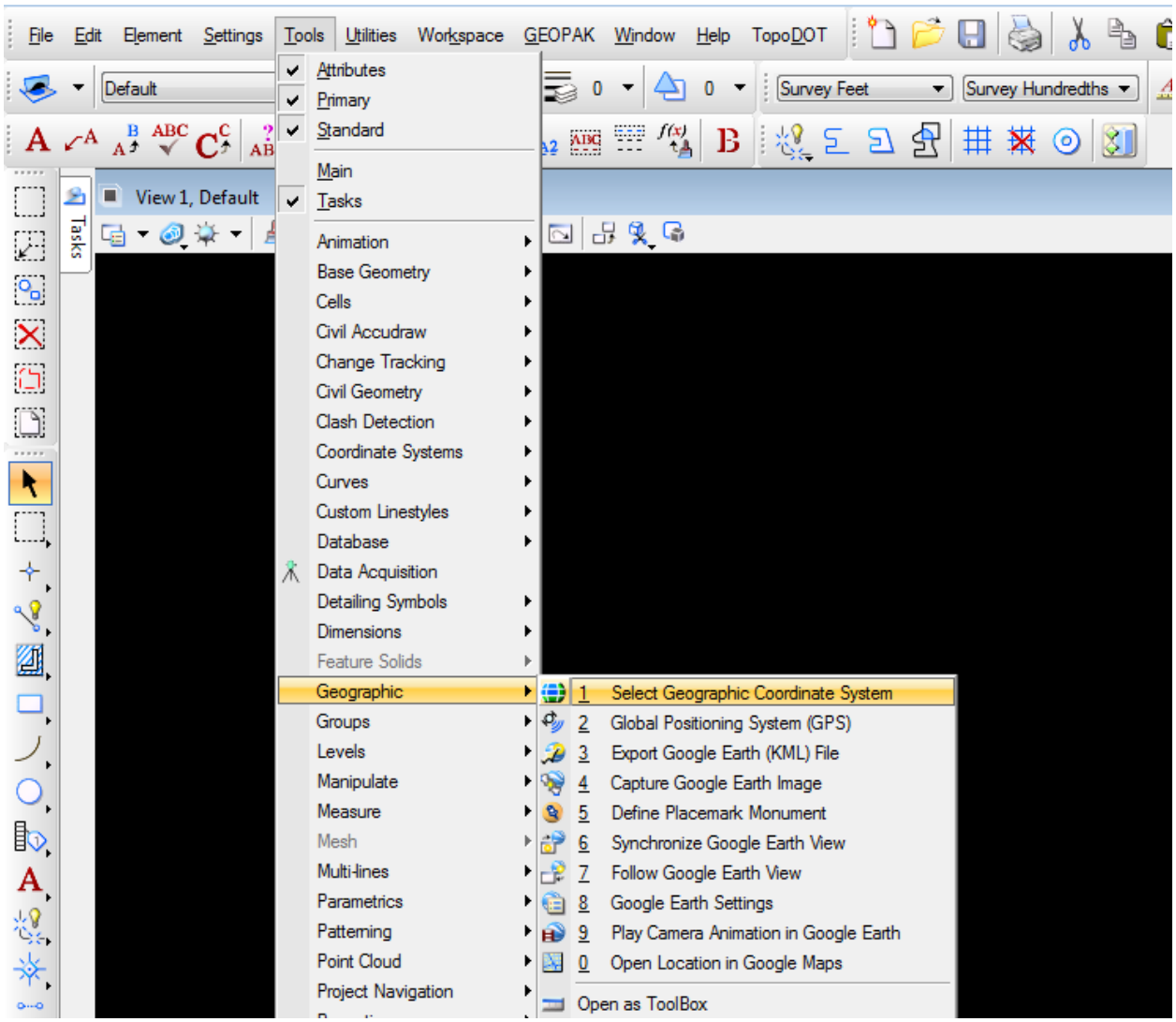
Creating a New GIS Feature File

To create a new GIS feature file open a new 2D file in the right of way configuration using the rwseed2d.dgn seed file. The file name will depend on the product being developed. Activate Bentley Map and open the command manager dialogue box. GIS features can be **placed** (created from scratch from command manager tools) or **promoted** (existing elements are promoted to GIS feature status). Note that there are curve tools for placing the "Alignment" and "RW_Line" in the command manager. There are no curve tools for placing the "Parcel" in the command manager at this time. For this reason when creating GIS featured parcels that include a curve in the geometry it is recommended that the parcel be promoted instead of placed. When a "Place" or "Promote" command is selected, the attribute dialogue box for the selected feature will open. Some of the red attributes are mandatory and must be completed to create The GIS feature. Other red attributes are contextual, in that they may be mandatory depending on previously chosen attributes. Once the GIS feature is created the place/promote dialogue box may be closed.

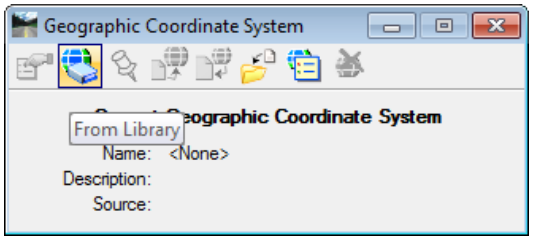
Geographic Coordinate System

The current geographic coordinate system for the project must be set to accommodate the import of Bentley Map products into GIS. The Geographic Coordinate System dialogue box can be found under the MicroStation menu "Tools" > "Geographic" > "1 Select Geographic Coordinate System". All files including the GIS master file must have geographic coordinate system set. For the purpose of this project, the coordinate system should be set to one of the state plane zones as noted below:

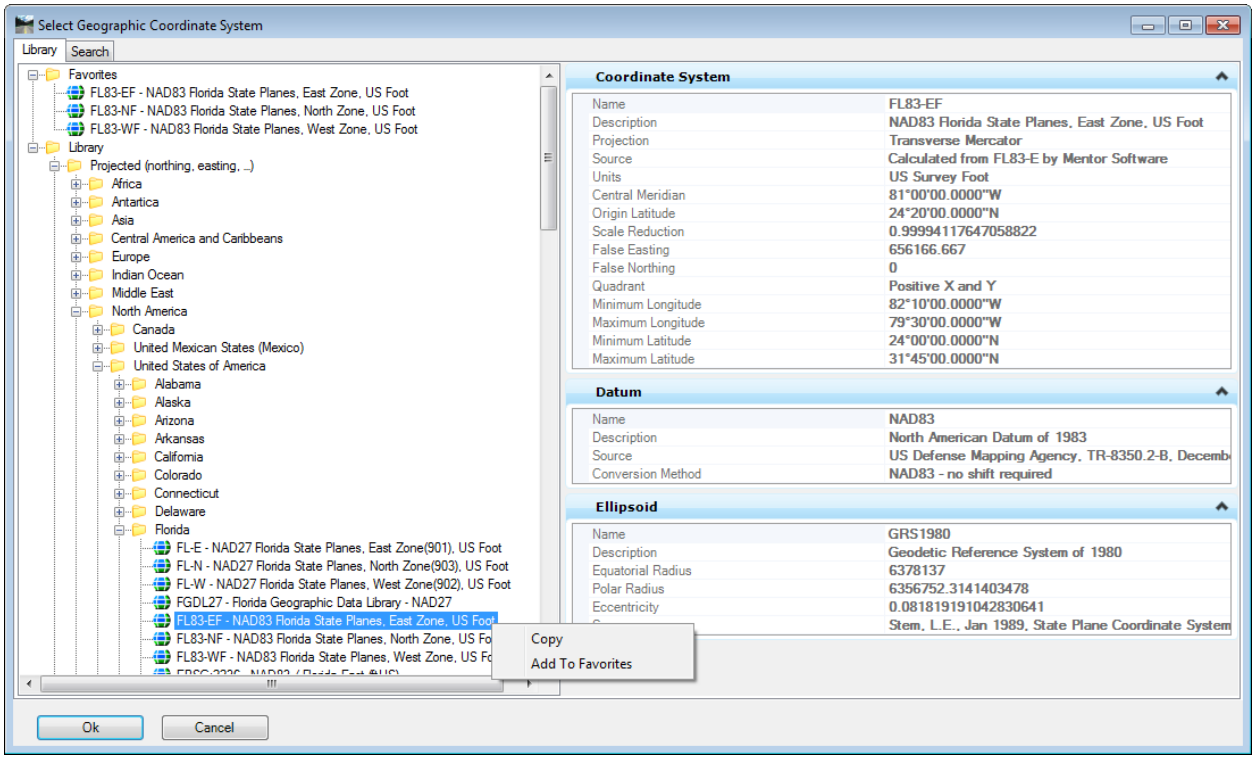
- FL83-EF – NAD83 Florida State Plane, East Zone, US Foot
- FL83-NF – NAD83 Florida State Plane, North Zone, US Foot
- FL83-WF – NAD83 Florida State Plane, West Zone, US Foot



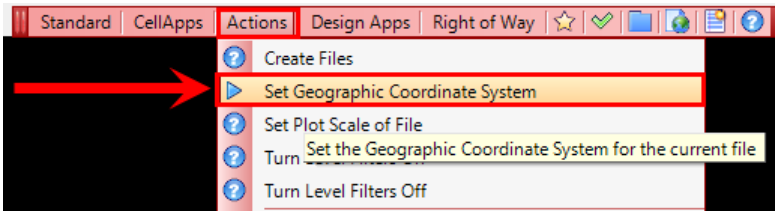
Select the “From Library” icon to choose a geographic coordinate system.



Note that the chosen projection can be added to the “Favorites” folder by right clicking and selecting Add to Favorites.



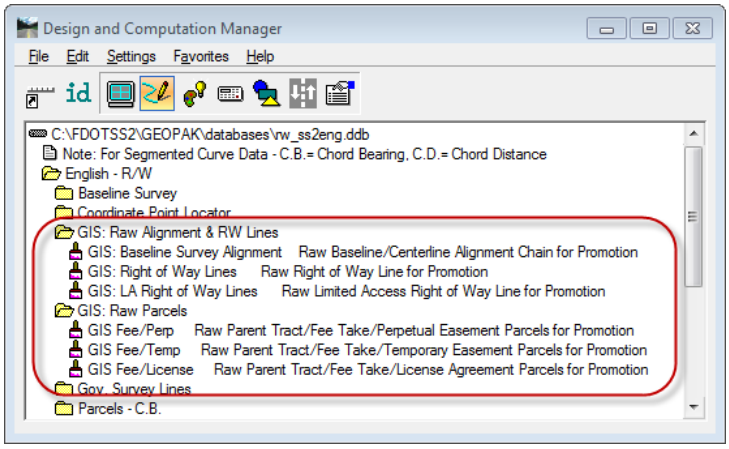
An alternate way of quickly setting the state plane zone is through the FDOT Menu under “Actions”.



Click on the appropriate zone on the Florida map to set the state plane zone in the Geographic Coordinate System dialogue box.

Using the D&C Manager to Create (Raw) MicroStation Elements for Promotion to GIS

For FDOTSS2 MR1 the rw_ss2eng.ddb has been revised to add two new categories in order to plot raw MicroStation elements with the D&C Manager for promotion to GIS as shown below.



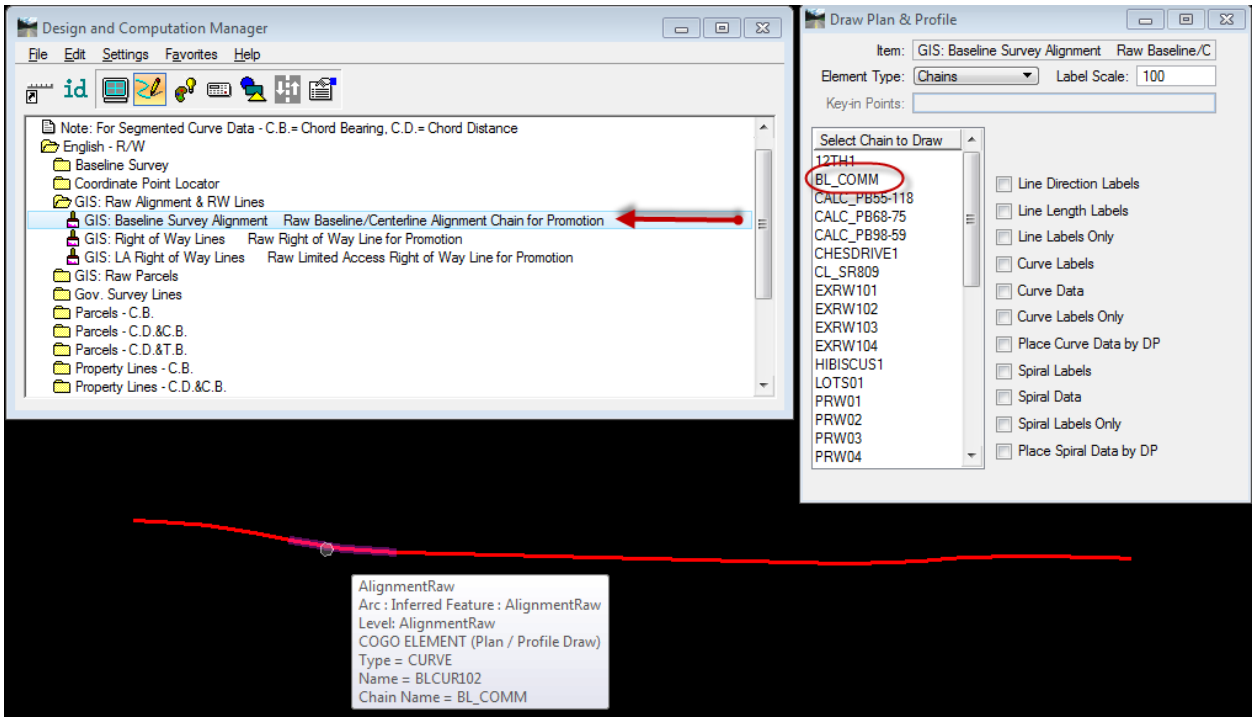
It is not necessary to have the raw elements on any particular level for promotion to a GIS feature. The Command Manager will automatically transform the raw element to a GIS level with the appropriate color weight and style as defined in the Command Manager when it is promoted. However, because the D&C Manager requires that MicroStation elements be plotted on a predetermined level, raw GIS levels have been provided for this purpose. At this time, all raw GIS levels have been assigned to the color red. Alignments and right of way lines can be plotted from chains, lines or curves. Parcels must be plotted from the Parcel element type in the Draw Plan & Profile dialogue box. Elements of the parcel that need to be plotted will greatly depend on how the parcel was stored in GEOPAK along with knowledge of the type of parcel being plotted. Do not plot labels. Annotation is not carried over into the GIS database and therefore must not be included.

For the examples below, all products will be **promoted** from existing MicroStation elements. These existing MicroStation elements will be created with the D&C Manager using the rw_ss2eng.ddb file. Another way to create existing MicroStation elements for promotion to

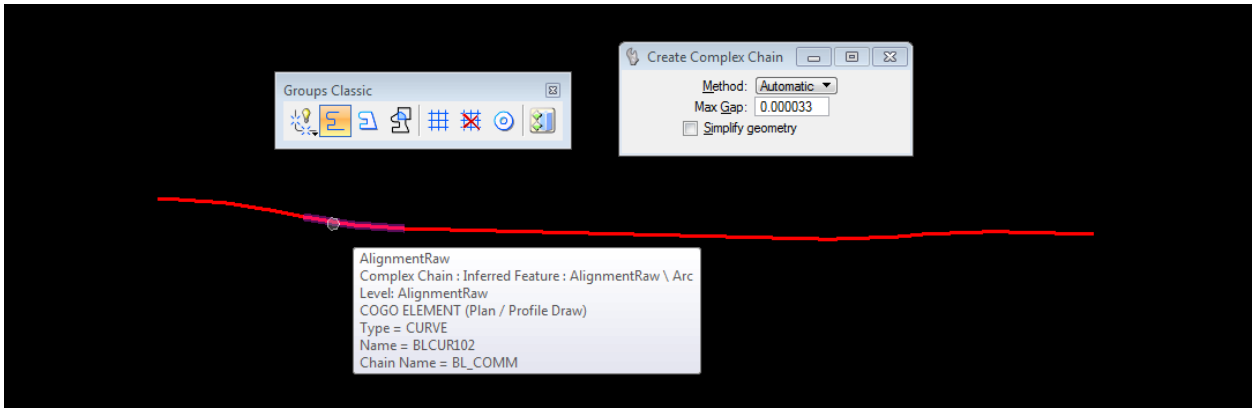
GIS would be to reference in the appropriate right of way map file and copy or trace the element.

Example GIS Alignment File

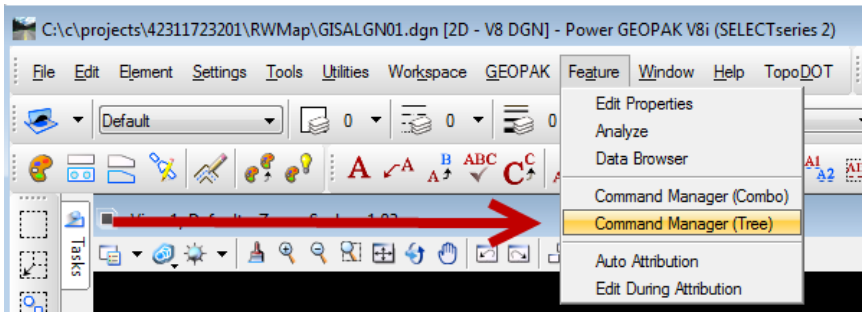
Create a GIS alignment file for the project by creating a new GISALGN01.dgn file. Open the D&C Manager and expand the "GIS: Raw Alignment & RW Lines" category. Select the "GIS: Baseline Survey Alignment" and plot the appropriate chain(s). Do not plot labels. In the example below the BL_COMM chain is plotted.



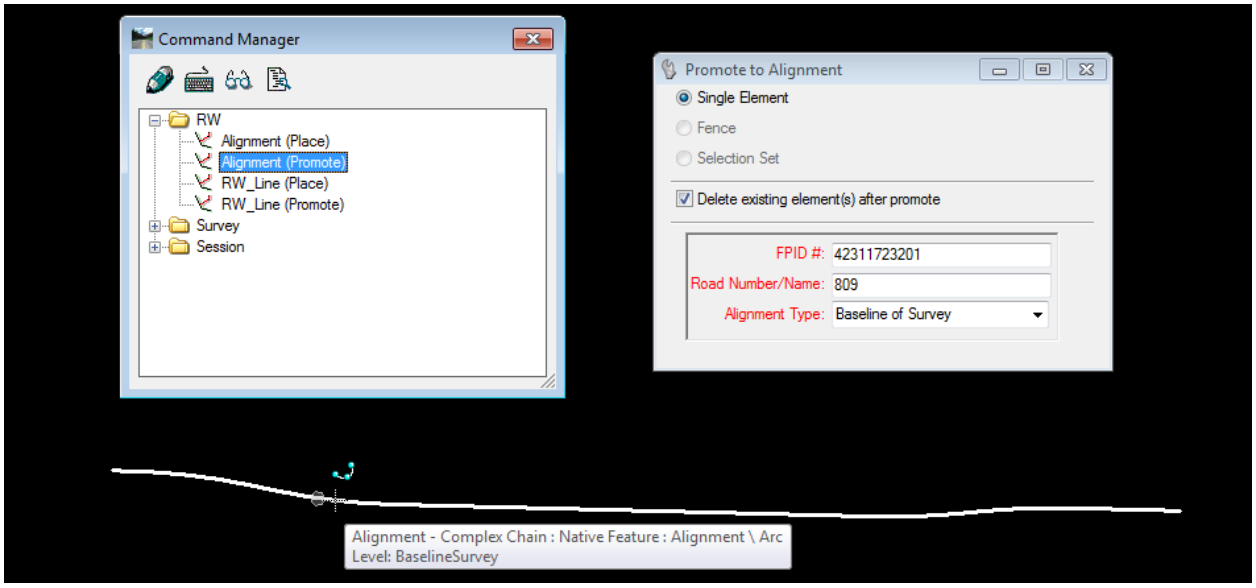
Note that the chain is not a single complex chain or polyline but instead is a series of line/curve segments. Also note the level name "AlignmentRaw". Set the active level to AlignmentRaw by holding down the Alt key and clicking the chain. To create a complex chain/polyline; use the MicroStation Create Complex Chain tool. Note the chain below is now a complex chain.



To create a GIS native feature from the complex chain, activate Bentley Map and open the Command Manager (Tree) dialogue box. Double click the “Alignment (Promote)” feature to open the “Promote to Alignment” dialogue box.



In this case, we will promote a “Single Element” however; a fence or selection set could be used to promote multiple elements at the same time. Check the “Delete existing element(s) after promote” box, in order to delete the unneeded raw complex chain/polyline. Enter the data for the known attributes and click on the chain to complete the promotion to a GIS feature and to delete the original complex chain/polyline. Hovering over the element will show the alignment to be a native feature on the level “BaselineSurvey”.

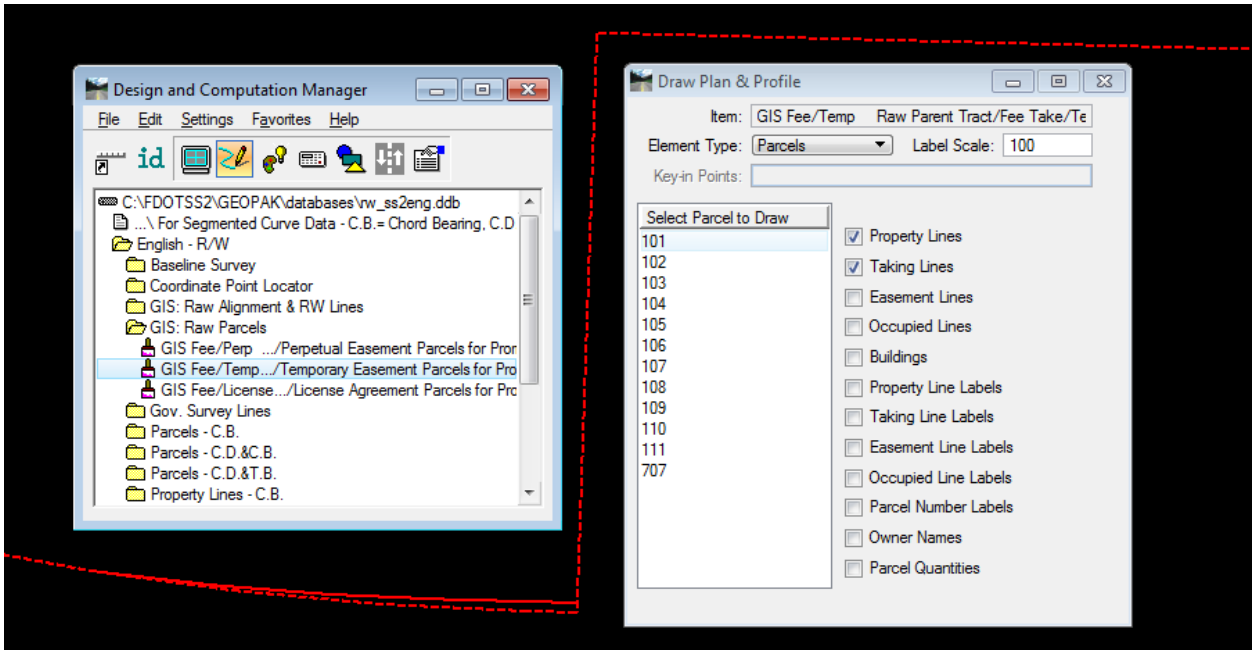


At the top of the command manager, you will notice four icons representing “Place”, “Edit”, “Analyze” and the “Data Browser”. The Place command is used instead of double clicking. Highlight the desired feature command and click on the Place icon (pencil) to activate the attribute dialogue box for placement. Clicking on the Edit command (keyboard) and then the GIS feature will allow editing of the attributes. Clicking on the Analyze icon (eyeglasses) and then the GIS feature will bring up the Analyze Result dialogue box allowing the attribute data to be viewed. Clicking on the Data Browser icon (printed page) will allow the viewing and editing of multiple features simultaneously.

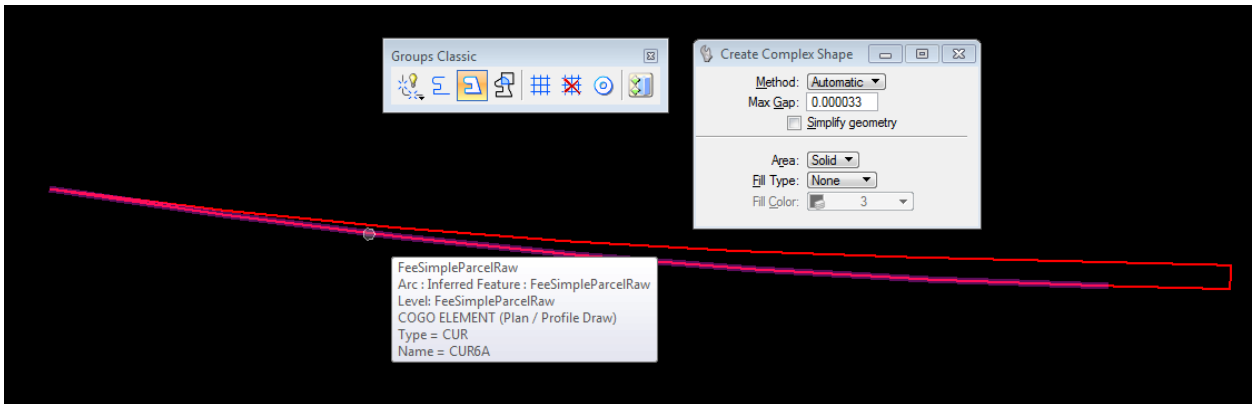
Once all alignments have been added to the GISALGN01.dgn file it is ready to be stored in the project GIS folder.

Example GIS Parcel File

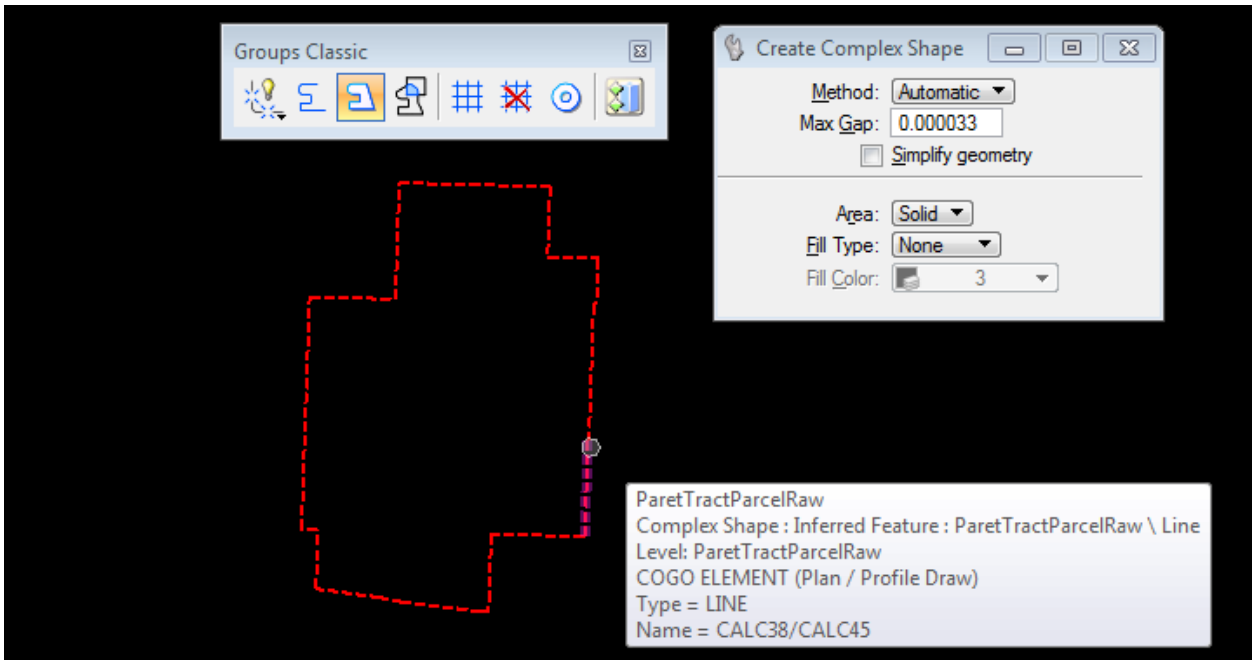
Create a GIS parcel file for the project by identifying the parcel to be promoted. In this example, we will create the GIS native features for parcel 101 by creating a new GISPAR101.dgn file. Open the D&C Manager and expand the "GIS: Raw Parcels" category. Because this parcel has a fee take and a temporary easement, the "GIS: Fee/Temp" could be used to plot both at the same time. However, since we will not include the temporary easement (parcel 701) in this file, any one of the raw parcel items in the D&C Manager could be used to plot parcel 101. For our example choose the "GIS: Fee/Temp" item and plot the parent track by checking the "Property Lines" box and plot the fee take by checking the "Taking Lines" box. Do not plot labels. In the example below parcel 101 is plotted.



As in the alignment example above, the parent track and parcel 101 are not complex shapes/polygons however; they must be to be promoted to a GIS native feature. Furthermore, parcel 101 is not a complete shape and only the taking lines are shown. Therefore, parcel 101 must be completed before it can become a complex shape/polygon. To do this the missing sides of parcel 101 can be clipped from the parent track by copying the appropriate parent track lines and matching these copied levels to the current parcel 101 level, "FeeSimpleParcelRaw". Isolating the FeeSimpleParcelRaw level (turn all other levels off) will allow easy trimming to complete all sides of parcel 101. To create a complex shape/polygon, use the Create Complex Shape tool.



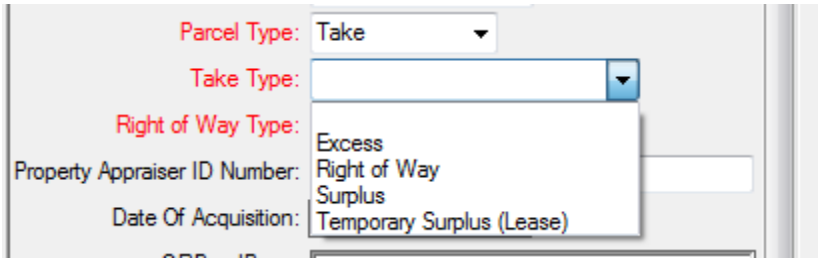
Turn off the FeeSimpleParcelRaw level and turn on the ParentTrackParcelRaw level. To create a complex shape/polygon of the parent track, use the Create Complex Shape tool.



Now that the parent track and fee take are complex shape/polygons, the Command Manager can be used to promote them to GIS native features. Turn all levels on, activate Bentley Map and open the Command Manager (Tree) dialogue box. Double click the “Parcel (Promote)” feature to open the “Promote to Parcel” dialogue box. Select “Single Element” and check the “Delete existing element(s) after promote” box. Note these must be selected before filling out the attributes because when they are selected they will clear current attributes. Once all known attributes are filled out, select the parent track to complete the promotion to a GIS native feature. Use the same procedure to promote the fee take parcel 101 except this time the Parcel Type will be a “Take”.

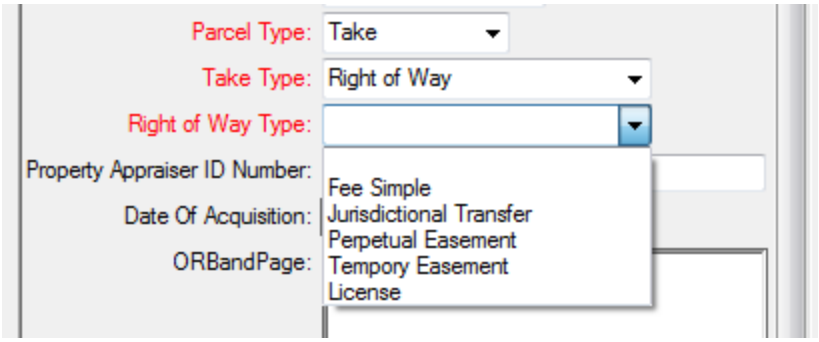
Note in the Promote to Parcel attributes dialogue box that when “Take” is chosen under Parcel Type, the Take Type can be selected.

- Select “Excess” if the take is outside of the required right of way
- Select “Right of Way” if the take is required right of way
- Select “Surplus” if the take has been determined to be surplus
- Select “Temporary Surplus (Lease)” if the take is being managed as a temporary surplus or lease to the public.



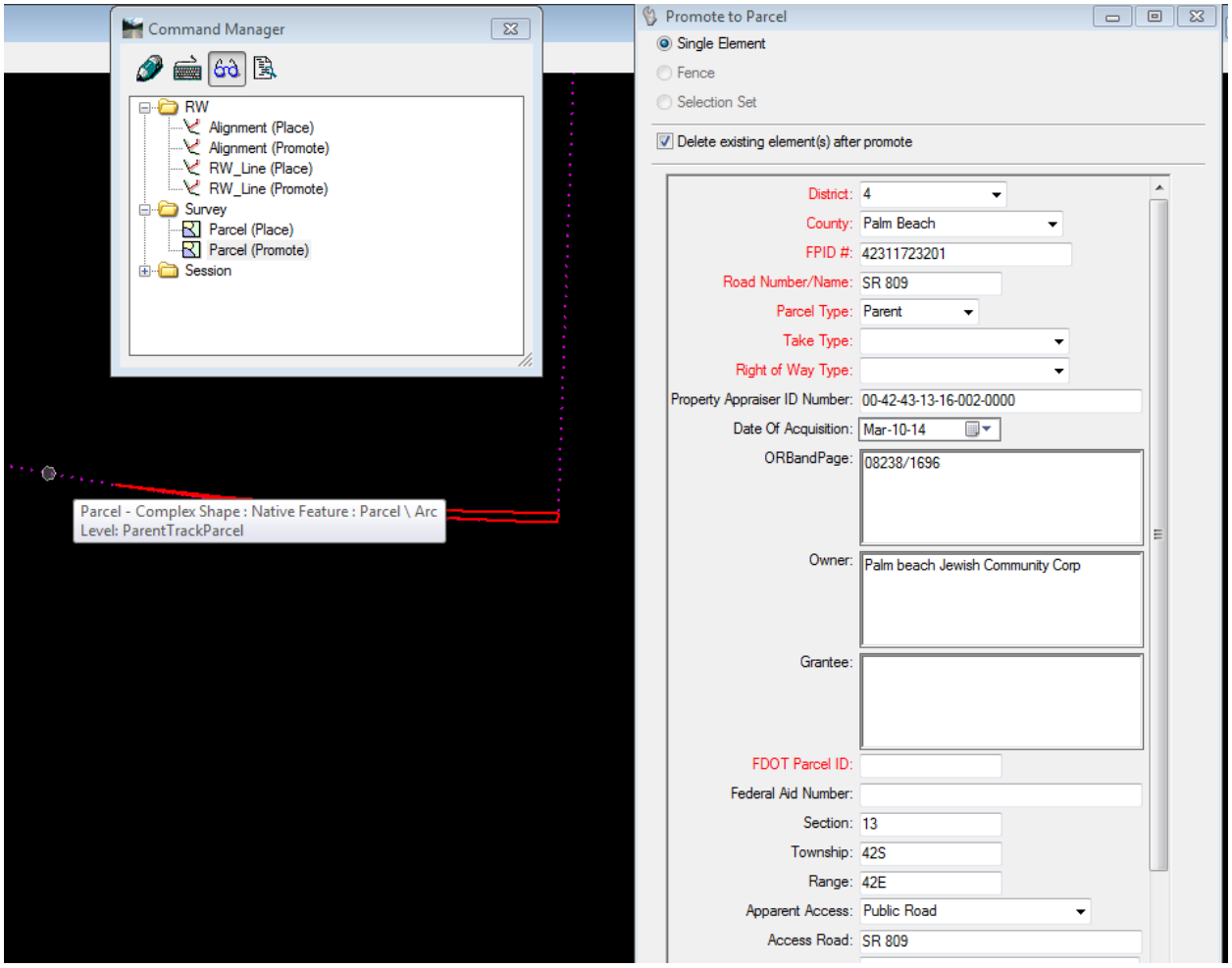
In the example above for Parcel 101, the “Take Type:” would be “Right of Way”.

Note in the Promote to Parcel attributes dialogue box that when the “Right of Way” is chosen under Take Type, the “Right of Way Type:” can be selected. Choose the appropriate right of way type to match the parcel being promoted.

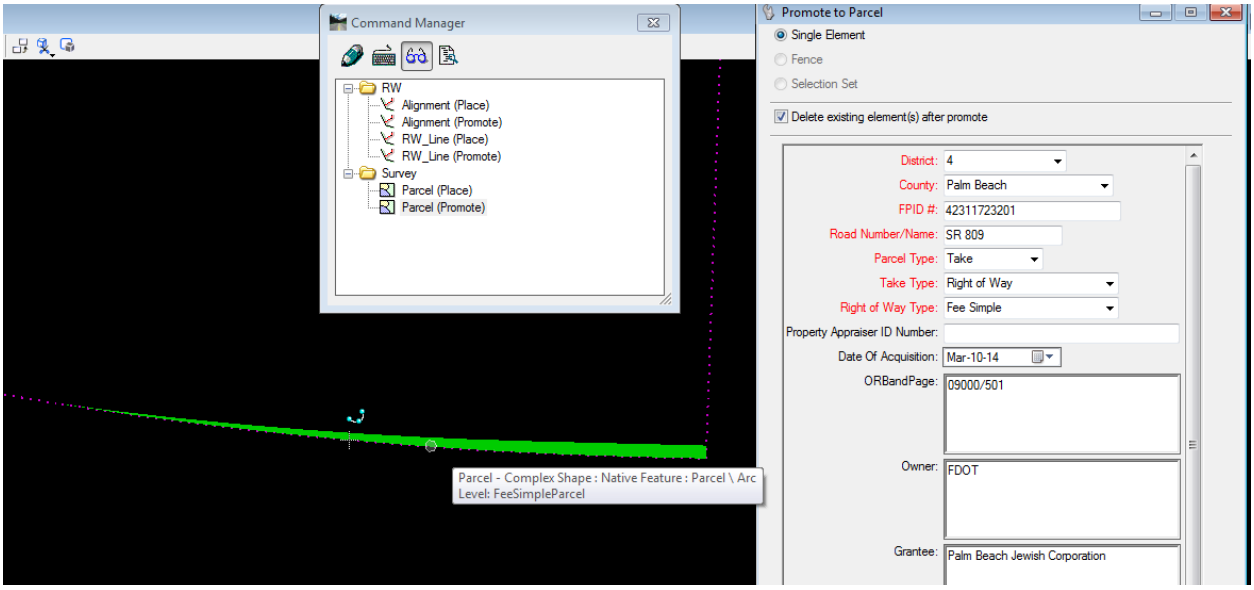


In the example above for Parcel 101, the “Right of Way Type:” would be “Fee Simple”.

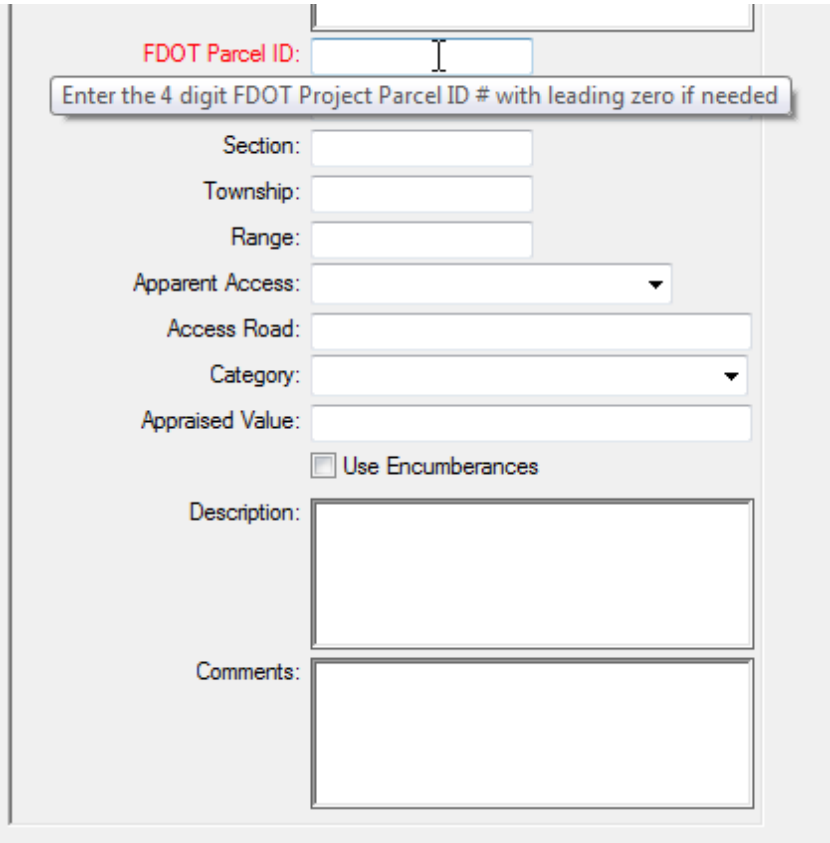
Below is an example of what some of the Parent Track attributes may look like.



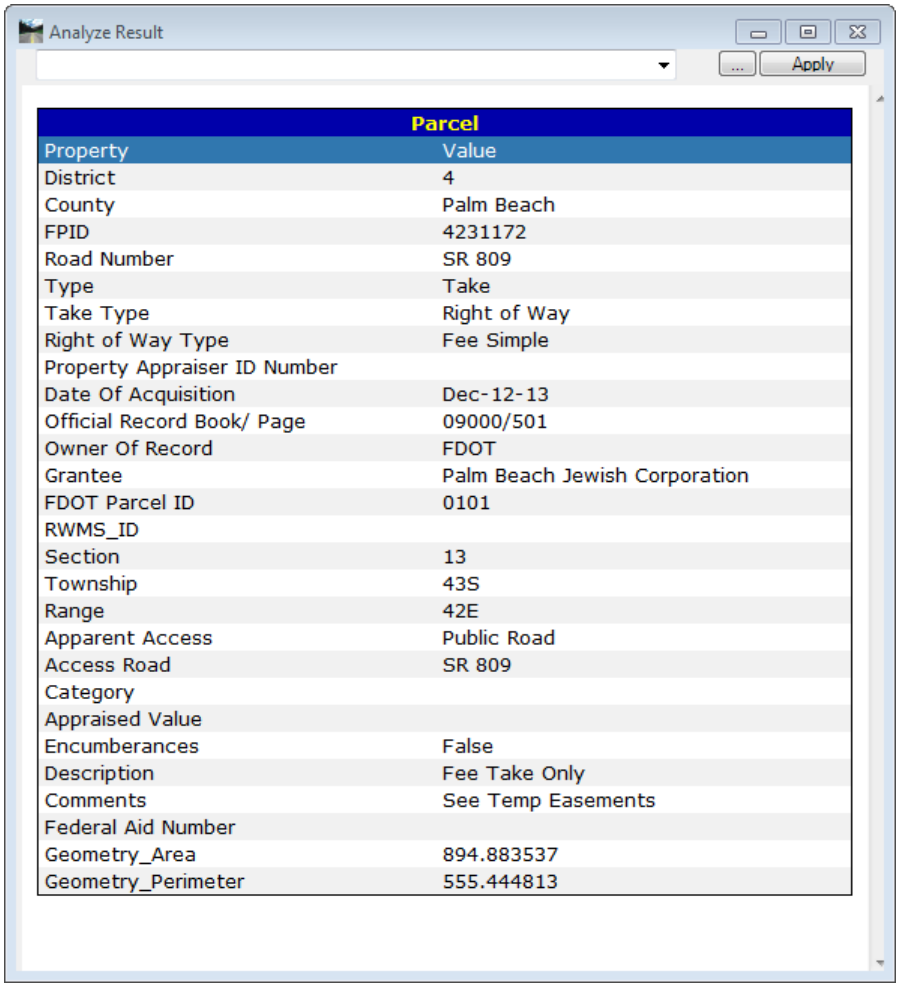
Below is an example of what some of the parcel 101 Fee Take attributes may look like.



The FDOT Parcel ID number is the last of the required fields and needs to be a four (4) digit number with leading zeroes to make it compatible to the parcel field used in RWMS.



Selecting Edit (keyboard) and clicking on a feature will let you edit the attributes of that feature. Selecting Analyze (eyeglasses) and clicking on a feature will bring up the Analyze Results box like below:

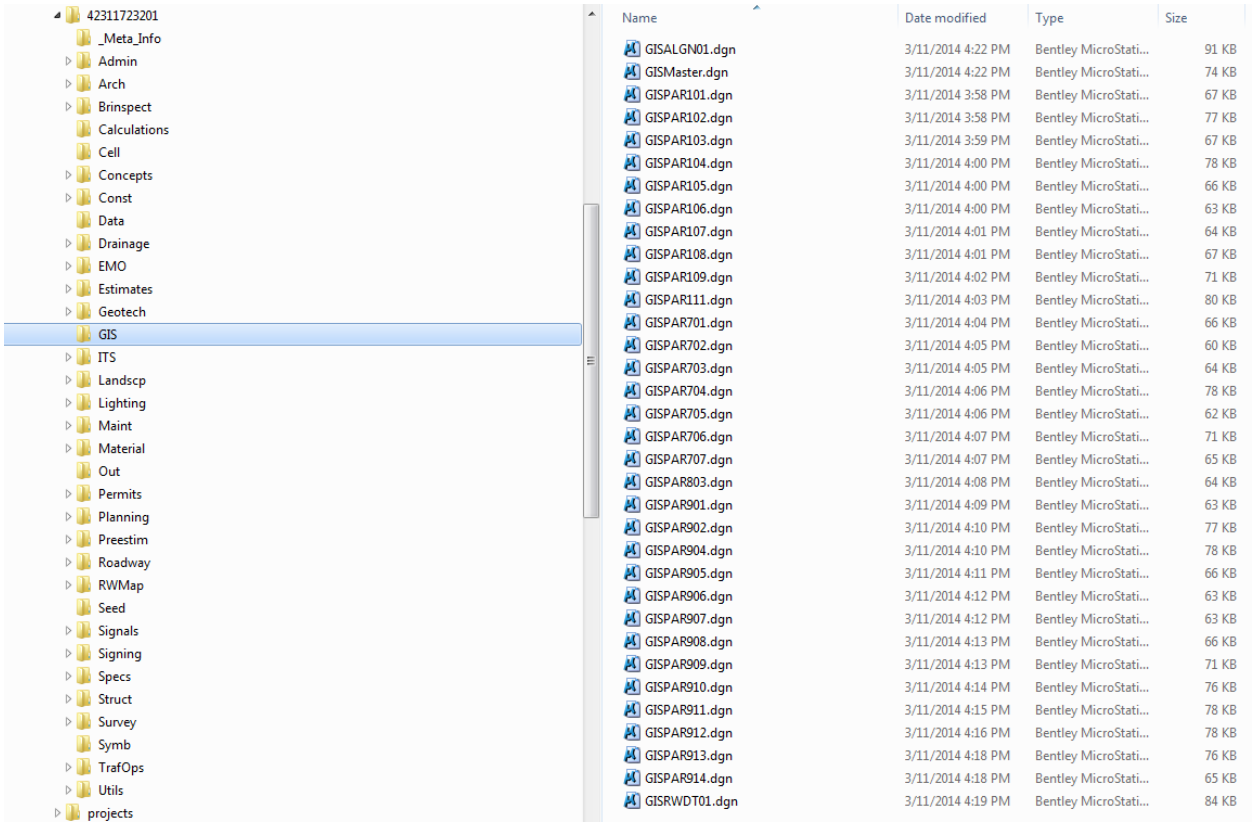


Parcel	
Property	Value
District	4
County	Palm Beach
FPID	4231172
Road Number	SR 809
Type	Take
Take Type	Right of Way
Right of Way Type	Fee Simple
Property Appraiser ID Number	
Date Of Acquisition	Dec-12-13
Official Record Book/ Page	09000/501
Owner Of Record	FDOT
Grantee	Palm Beach Jewish Corporation
FDOT Parcel ID	0101
RWMS_ID	
Section	13
Township	43S
Range	42E
Apparent Access	Public Road
Access Road	SR 809
Category	
Appraised Value	
Encumberances	False
Description	Fee Take Only
Comments	See Temp Easements
Federal Aid Number	
Geometry_Area	894.883537
Geometry_Perimeter	555.444813

When parcel 101 is complete with both the parent track and the fee take parcel the file GISPAR101.dgn is ready to be added to the project GIS folder. For this project, there is also a parcel 701 and a parcel 901. In the same manner as above GISPAR701.dgn and GISPAR901.dgn can be created however, it is not necessary to include the parent track because it is already included in GISPAR101.dgn.

The Project GIS folder

In order to provide a repository for GIS friendly products that will be exported into GIS features, we are proposing to add a project GIS folder to the project folder structure. This GIS folder will reside in the project folder structure between Geotech and ITS. Eventually all alignment, right of way line and parcel files will be placed in the GIS folder and added to TIMS. If the GIS folder is added to the project template then it may look something like below:



Right of Way, Excess and Surplus Property

A crucial component of this project is to provide a way for GIS to track excess and surplus property that is governed by section 337.25 of the Florida Statutes. Generally, property acquired along the corridor but outside of the required right of way is designated as excess until such time the department deems the property right of way or surplus property. There are exceptions, along and well outside of the corridor such as property for conservation purposes, environmental mitigation or property being leased to the public. In order for GIS to efficiently track these real properties it is necessary, as part of this project, to identify as many of these situations as possible. At this time, the software provides a way to select Excess, Surplus and required right of way. Please let us know if there are other categories that need to be added to accurately track property acquisitions.

GIS Product Development Process (Part 2)

The CADD files produced by the Right of Way Mappers have a folder in TIMS for all GIS products organized by project (see The Project GIS folder) where the district GIS department will have access to all GIS information for the project in a single location.

Once the CADD files have been put into the GIS folder and the GIS department has been notified (this will require new communication routes between the Right of Way Mappers and the GIS department) the GIS department will extract the data (right now all the data is stored within the MicroStation DGN file) into shape files or a file geodatabase.

Bentley Map GIS Product Extraction

Software needed:

- TIMS (Project Navigator)
- FDOTSS4 MicroStation, Power GEOPAK V8i SS4
- ArcMap

For Information on MicroStation version needed see section Bentley Map GIS Product Creation.

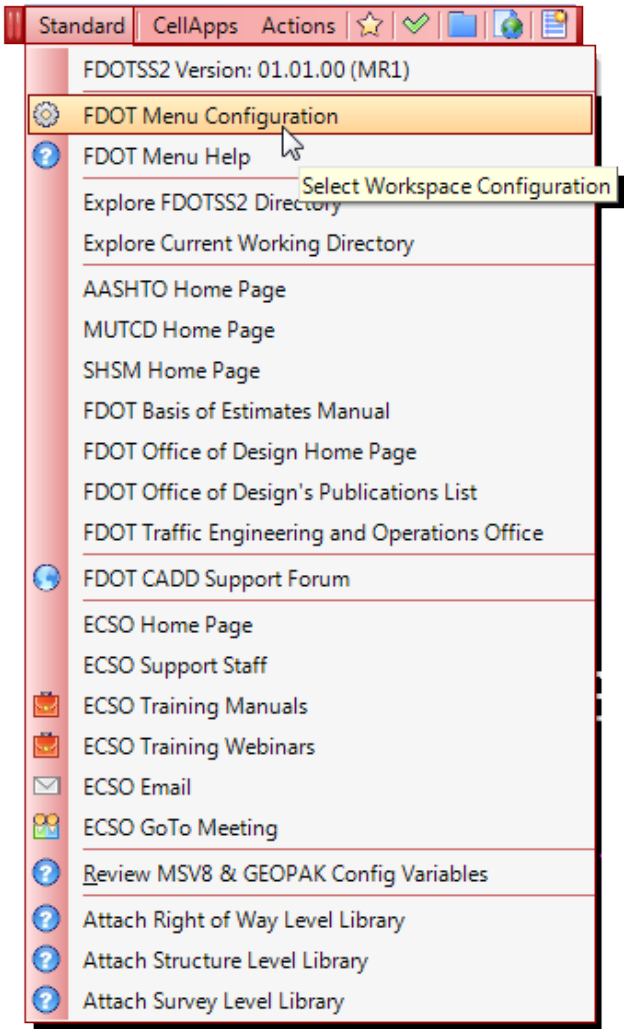
First "Copy out" "With References" the desired file from TIMS (Project Navigator), located within the Project GIS folder. See Appendix A for explanation of file naming convention and the section on The Project GIS folder for locations. The easiest one to work with will be the GISMaster, as all of the files currently completed for the project are referenced into this one. However, make sure to talk with the ROW Mappers as parcels may/will change over the life of the project and the GISMaster will need to be updated.

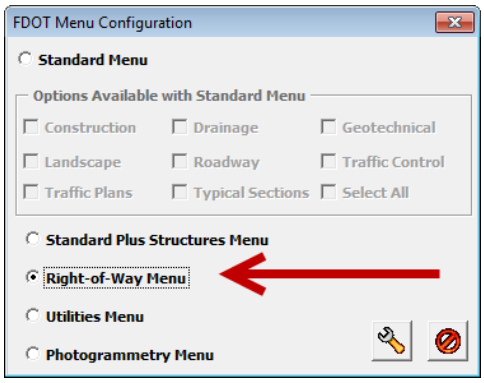
TIMS (Project Navigator) creates a Local Project tree at C:\e\projects\"*FPID# for the Project"* refer to the section on The Project GIS folder for an example of a full project tree. When checking out a single file, TIMS (Project Navigator) will only "build" as much of the tree as it needs to put the desired file on a local machine, so don't expect to see the full tree.

Open MicroStation using the FDOTSS4 icon and browse to the GISMaster location stored in the local project tree.

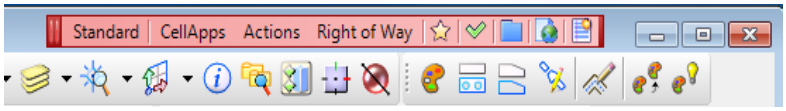
Activating Bentley Map

To activate Bentley Map and have the preset resource files available to build the products described in this project, open FDOTSS4 in the Right of Way Mapping configuration. The FDOT Menu Bar will show as a menu option "Right of Way" when the right of way mapping configuration is active. To activate Bentley Map in the MicroStation menu bar select "GEOPAK" to open the drop down menu and select "Activate Map" at the bottom of the drop down menu. Once Bentley Map is active, new File drop down menu options are available "Map Interoperability" and under "Export" "GIS Data Types" will be available to export GIS features.

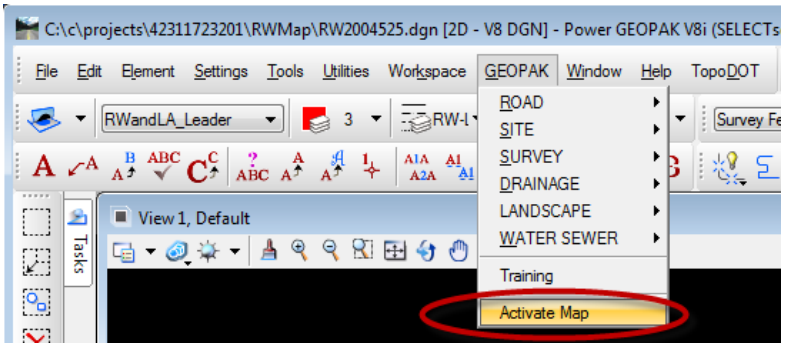




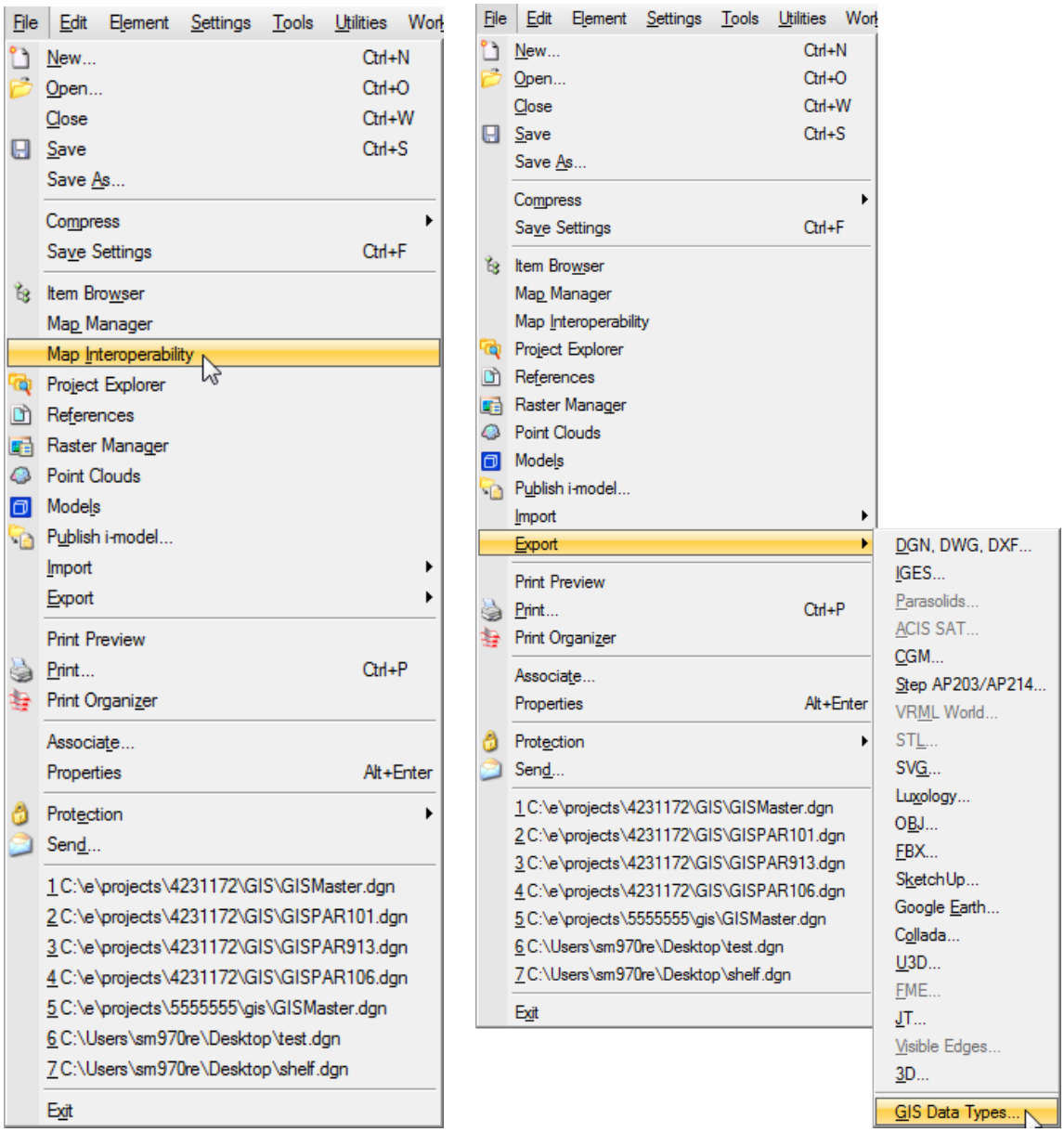
The “Right of Way” FDOT menu bar configuration:



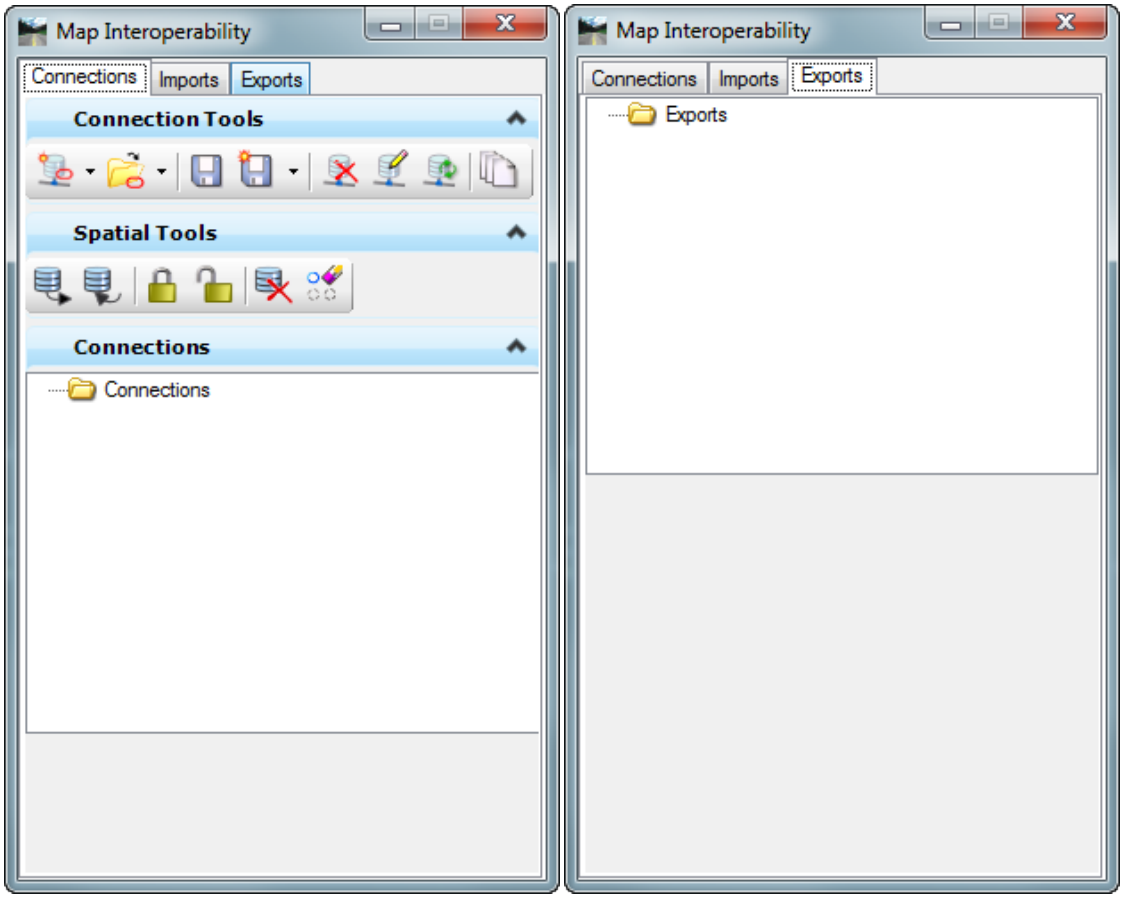
Activate Bentley Map:



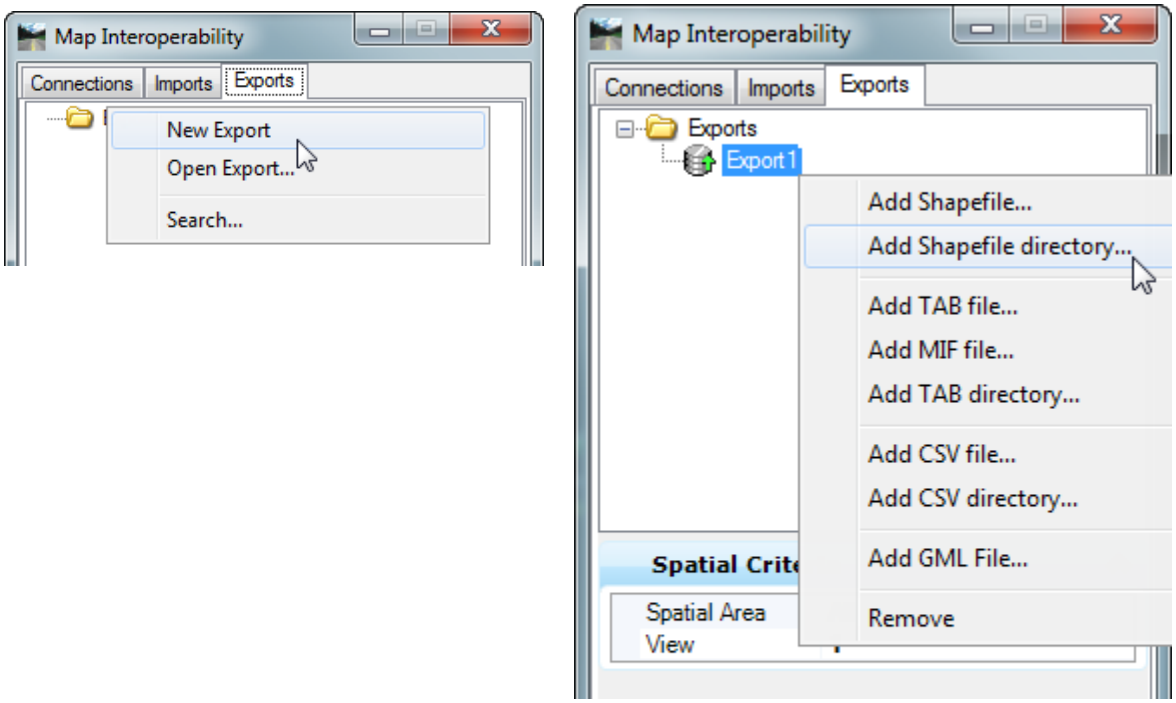
Once activated you have new options in the File drop down menu for working with GIS data.



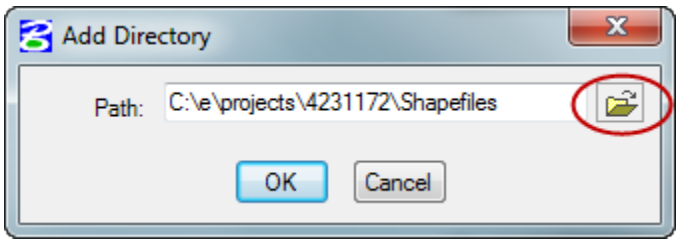
Either of these go to the same dialog box, go to the Exports tab.



Right click on Exports and choose New Export, right click Export1 and Add Shapefile directory (this is where the exported shapefiles will be stored.

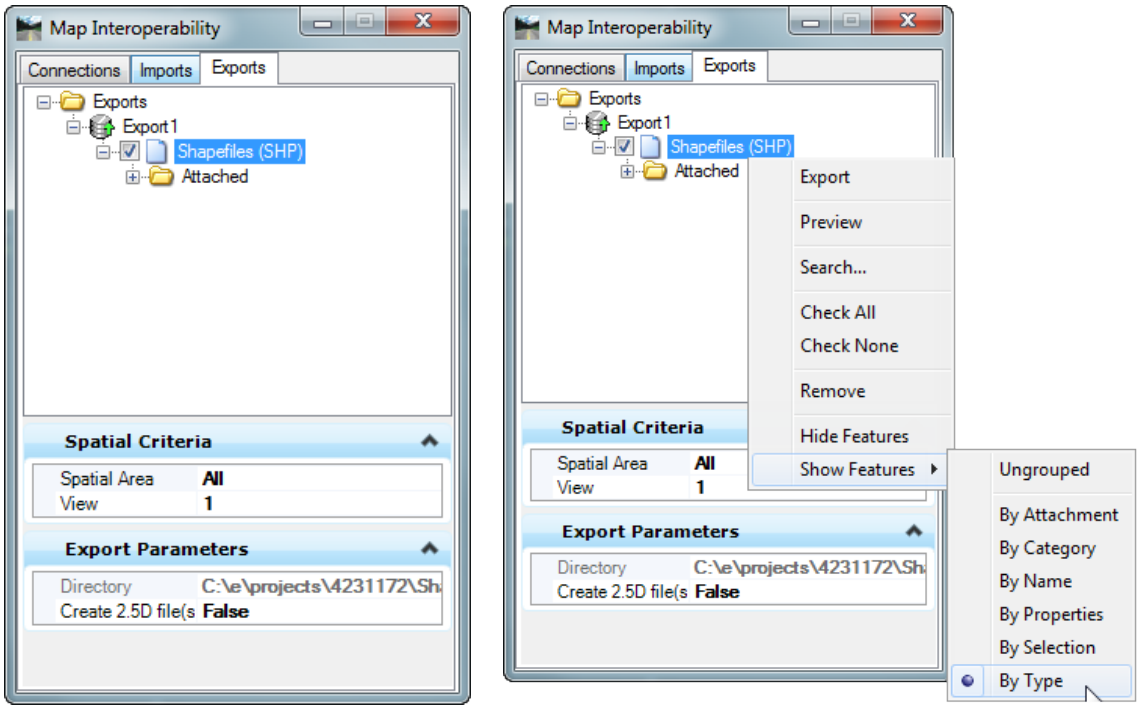


Browse to where the Shapefiles are to reside. It will also remember the last choice, so be careful if working on multiple projects. Remember, these are per project.



Feature Geometry

Once the shapefile directory is added, (the shown location is a folder called Shapefiles in the local project tree) it would be helpful to show the features by Type. Right click on “Shapefiles” expand the “Show Features” and click on “By Type”



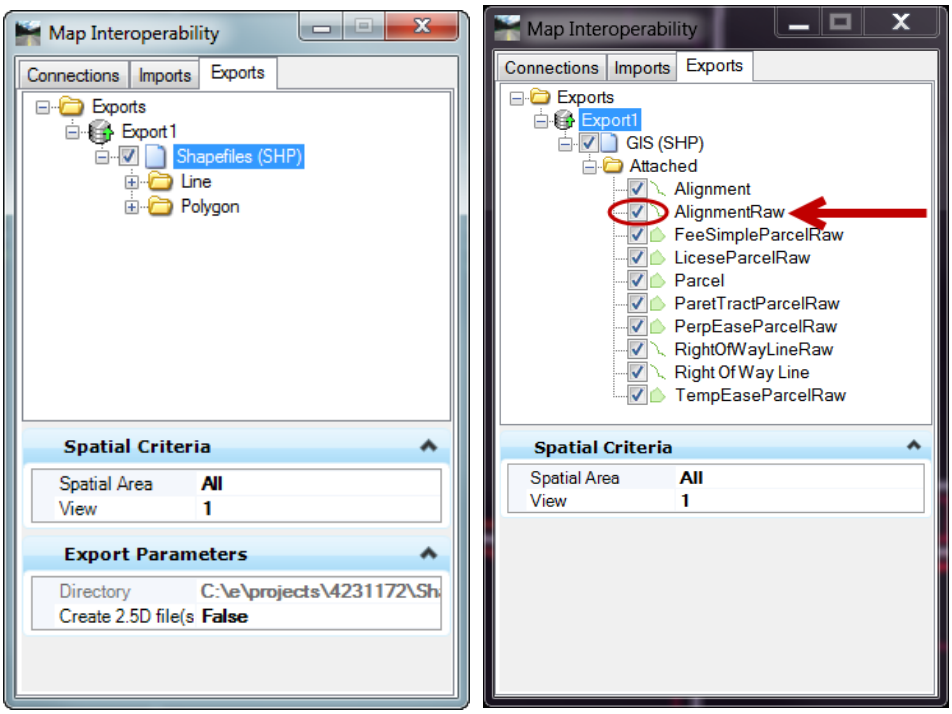
Now look at the Feature Name to check for incorrect data types

If the Name has	It will always be a
Parcel	Polygon
Alignment/Line	Line

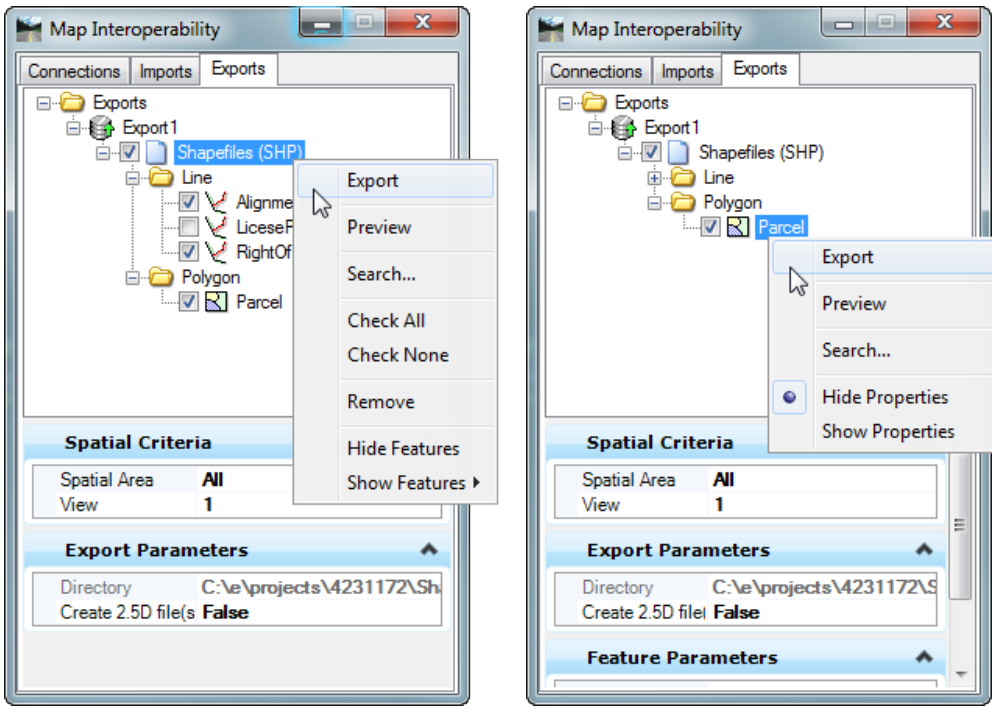
If a feature has parcel in its name, it should be in the polygon section, if it is in the Line section **DO NOT** export. It is a fragment that was missed during the file clean up process.

Also look at the names and if any have Raw in it **DO NOT** export. It is a fragment that was missed during the file clean up process.

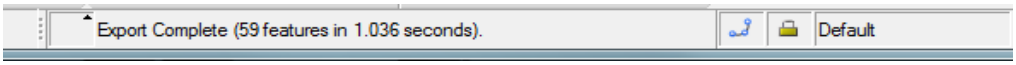
Just uncheck the box next to the feature so it is not exported.



Once satisfied with data types and names, right click the Export1 to export all features that are checked, or right click a feature type to export only those features.



Once export is complete, MicroStation will show a message at the bottom of the application window: Export Complete, how many features were exported and how long it took.

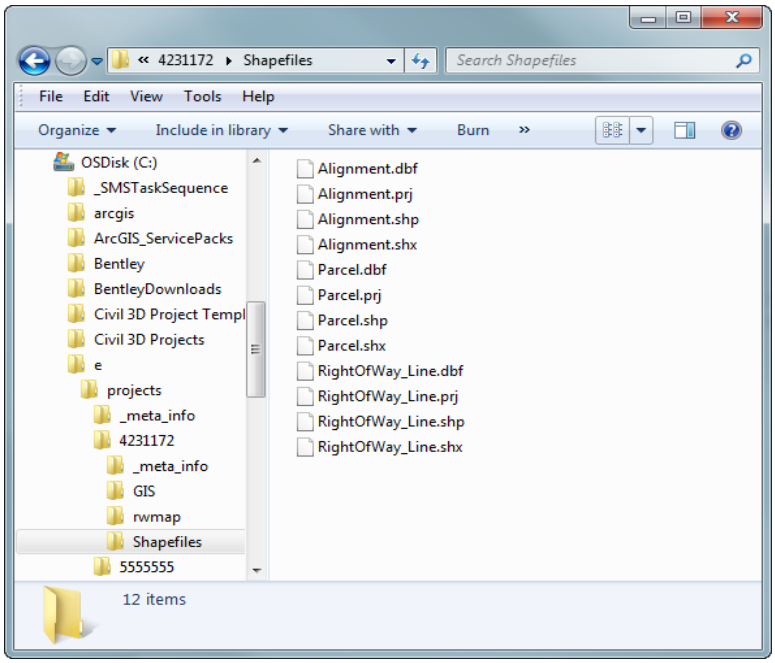


If a projection was set in MicroStation then there will be four files per type,

- .dbf
- .prj
- .shp
- .shx

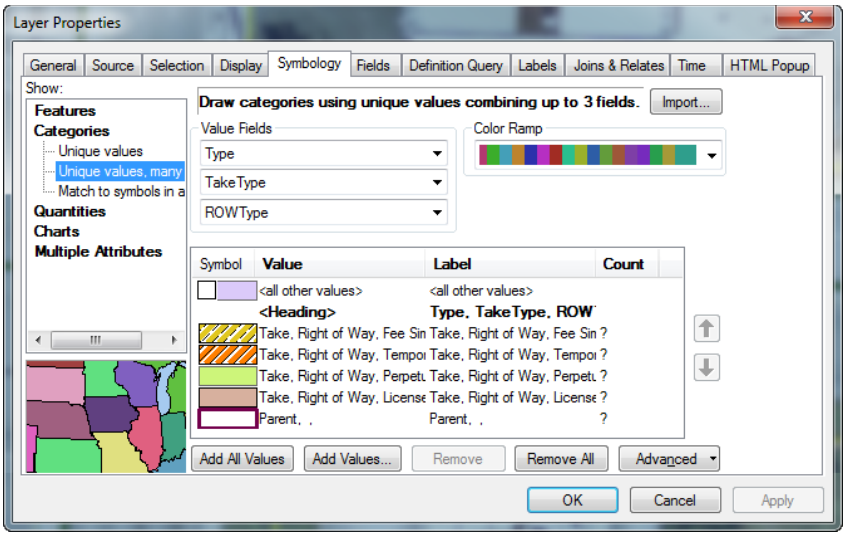
If not there will only be three,

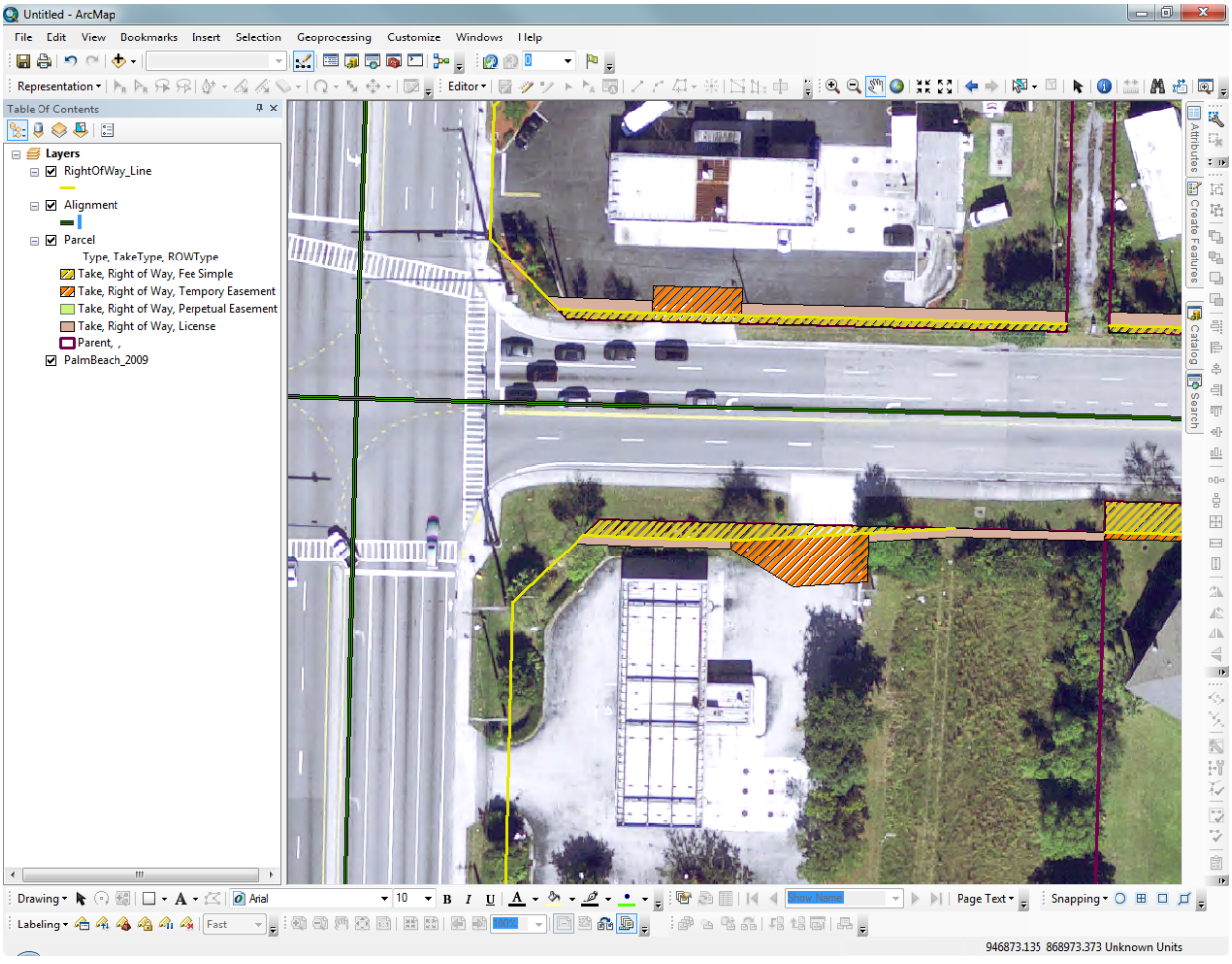
- .dbf
- .shp
- .shx



If the .prj file is present, then just bring into ArcMap and add any other information needed for the project: aerials, roads, county boundaries, district boundaries, etc. and symbolize to show all the differences.

If the .prj file is not present, then set projection in Arc Catalog before bringing into ArcMap.


Layer Properties
General
Source
Selection
Display
Symbology
Fields
Definition Query
Labels
Joins & Relates
Time
HTML Popup
Show:
Features
Categories
Unique values
Unique values, many
Match to symbols in a
Quantities
Charts
Multiple Attributes
Draw categories using unique values combining up to 3 fields.
Import...
Value Fields
Type
TakeType
ROWType
Color Ramp
Symbol
Value
Label
Count
<all other values>
<all other values>
<Heading>
Type, TakeType, ROW
Take, Right of Way, Fee Sin
Take, Right of Way, Fee Sin ?
Take, Right of Way, Tempoi
Take, Right of Way, Tempoi ?
Take, Right of Way, Perpetu
Take, Right of Way, Perpetu ?
Take, Right of Way, License
Take, Right of Way, License ?
Parent, ,
Parent, , ?
Add All Values
Add Values...
Remove
Remove All
Advanced
OK
Cancel
Apply


Untitled - ArcMap
File
Edit
View
Bookmarks
Insert
Selection
Geoprocessing
Customize
Windows
Help
Table Of Contents
Layers
RightOfWay_Line
Alignment
Parcel
Type, TakeType, ROWType
Take, Right of Way, Fee Simple
Take, Right of Way, Tempory Easement
Take, Right of Way, Perpetual Easement
Take, Right of Way, License
Parent, ,
PalmBeach_2009
Attributes
Create Features
Catalog
Search
946873.135 868973.373 Unknown Units

Appendix A

DGN File names

GISPAR###	Parcel file where the where the “GISPAR” is the standard file name and the ### represents the parcel take number (the three digit FDOT Parcel ID Number)
GISRWDT##	Right of Way Line file where the “GISRWDT” is the standard file name and the ## represents a two digit number in case multiple files need to be built
GISALGN##	Alignment File where the “GISALGN” is the standard file name and the ## represents a two digit number in case multiple files need to be built
GISMASTER	All parcels, Alignments and Right of Way lines referenced into a single file

Appendix B

GIS Troubleshooting

Duplicated Features

If you export the same file more than once, the new shapefile does not overwrite the old one, it simply adds the shape to the file again. This could be useful in adding new parcels from their individual files (not the GISMaster) where it is the only thing being added. However, if adding from a file that was already included it will just duplicate the feature, giving it a new FID (Object ID) and add it to the dataset, their will be no warning about adding a duplicate.

Summary

The overall purpose of this document is to inform the Right of Way Mappers of the goals of this project and to document the workflow as it was initially constructed. It is not an official procedure or definitive "how to". What is needed is input and feedback on all aspects of this pilot project. Nothing in the above document is sacred and all suggestions are welcome. If you do not have any comments on the MicroStation/Bentley Map construction workflow or the associated products, then please look at the product attributes carefully and lets us know what needs to stay, what needs to go and what needs to be added. Don't limit your imagination.

Thank you for your efforts and please direct all comments to:

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