

Importing Shapefiles for Stakeout

Overview: Use the following process for creating points in ArcMap or ArcGIS Pro and exporting them to a Trimble Access survey controller for stakeout. The work must be exported in a real world coordinate system that matches the Trimble settings. The points will be exported to a shapefile dataset which will need to be copied to the Trimble Access unit and connected to the staking survey job as an active map.

Software: ESRI ArcMap 10.0 or newer, Projection file: *NRCS_IA_UTMif.prj*. Windows Mobile Device Center. Trimble Access v2022.01 on Trimble T10 or TSC7 controller.

Notation: <input type="checkbox"/> Button to Press <i>Displayed Text</i> Icon <u>Action</u> {Text to Enter} <i>Menu Item...</i>

Part I



Create and output Points from ArcGIS for use in Trimble.

- ◆ This process creates point shape files to be ready for use in Trimble Access. The coordinate projection of the shape file needs to match the job used in Trimble Access. (Iowa NRCS uses NAD 83 UTM Zone 15, International Survey Feet.) Elevations of an object are NOT brought into Trimble.
- ◆ The correct coordinate system must be set **before** creating points in the shapefile.
- ◆ Method A is when working directly in ArcMap. Method B is for use with Conservation Desktop.
- ◆ This works for GIS polygons and polylines as well as points.

Part I - Method A

- ◆ Using ArcMap to create a Points shapefile for staking

Create the shapefile with the correct Coordinate system:

- 1) In Catalog  browse to a location to save the new shapefile. Make a note of this location so you can find it later.
- 2) Right click on the folder and click *New... Shapefile...*
- 3) Input a name for the shapefile. E.g. {MyProjectPoints}
- 4) Pull-down Feature Type to *Point*. Click *Edit*.
 - a) Click the down arrow to the right of the globe (), select *Import* and browse into the folder where you have saved the Iowa NRCS projection.
 - b) Select *NRCS_IA_UTMif.prj* and click . Click .
- 5) Click the new shapefile will be created and added to the Table of Contents.

Create Points in the Shapefile:

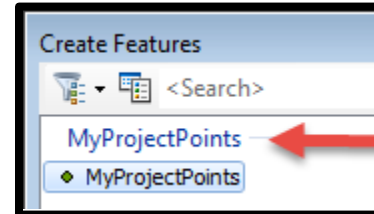
- 6) In the *Table of Contents* right click the shapefile layer (E.g *MyProjectPoints*)
- 7) Click *Edit Features... Start Editing...*
- 8) A message might appear noting that the spatial reference does not match the data frame. Click


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- 9) Under the Editor Toolbar *Click the Create Features Button*



- 10) In the Create Feature window click on the heading for the *MyProjectPoints* list.



- 11) At the bottom of the Create Feature window click on the Point icon  within the Construction Tools.

12) Digitize the points that you want to add.

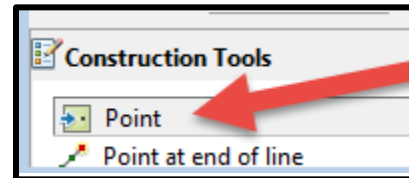
13) When done adding points, in the Editor toolbar

click *Editor* ▼ *Stop Editing* .

14) When asked to save edits click **Yes**

15) Save your ArcMap work.

16) Exit out of ArcMap.



The shapefile that you just created is ready for use in Trimble Access. Go to Part II.

Part I - Method B

- ◆ Using Conservation Desktop to create a Points shapefile for staking

Create the shapefile in Conservation Desktop:

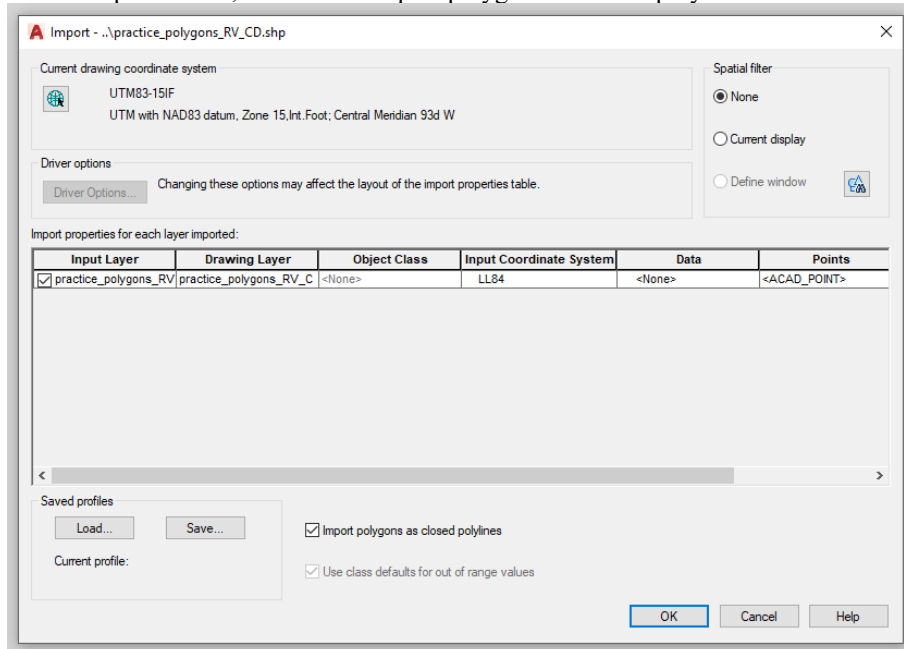
- 1) Create a point, line, or polygon feature in CD or select an existing one to export.
- 2) Export the shapefile as a zipped file

Convert the Conservation Desktop shapefile coordinates to UTM83-15ift:

- 3) Conservation desktop uses a coordinate system that is different from Trimble Access. You will need to transform the data using one of two methods:

Convert CD shapefile using Civil 3D

1. Unzip the file using WinZip.
2. In Civil 3D type MAPIMPORT and hit enter
3. Browse to and select the shapefile that you would like to import and click OK
4. On the import screen, checkmark Import polygons as closed polylines and click OK



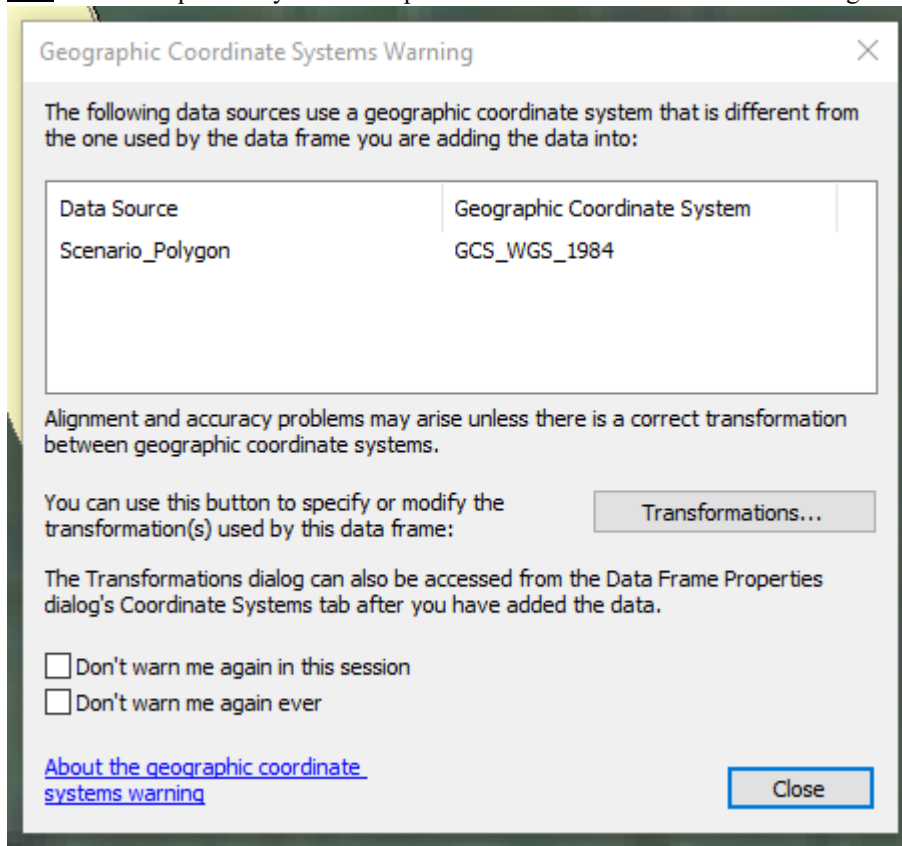
5. Once that has imported, type in MAPEXPORT and hit enter
6. Browse to where you would like to save the new shapefile, input a unique name, and click OK
7. Select the Object type, choose the Select Manually option, click the icon and draw a polygon around the features you would like to select. Hit Enter
8. On the Data tab, click Select Attributes, checkmark next to Properties, Click OK
9. On the Options tab, verify that the coordinate conversion reads UTM83-15IF and click OK
10. The exported shapefile should be converted and ready for use.

Convert CD shapefile using ArcMap

1. Unzip the file using WinZip.

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2. Add the CD shapefile to your ArcMap document. You will receive this warning:



- This is ok because we will change the projection of the file. Click *Close*.
3. Navigate to *ArcToolbox* → *Data Management Tools* → *Projections and Transformations* → double-click *Project*. The *Project* dialogue box should appear.
 4. Pick your shapefile from the dropdown menu. For CD created files, the *Input Coordinate System* should read: *WGS_1984_Web_Mercator_Auxiliary_Sphere*
 5. Choose where you would like to save your transformed shapefile and give it a unique name. Click *Save*.
 6. Click the icon next to *Output Coordinate System* to pick the coordinate system you wish to transform the shapefile into. Navigate to *Projected Coordinate Systems* → *UTM* → *NAD 1983* → *NAD 1983 UTM Zone 15N*. Select it and click *OK*.
 7. Once you have selected the *Output Coordinate System*, ignore all the other options in the dialogue box and click *OK* at the bottom of the screen.
 8. Once the operation has successfully completed, the new shapefile will display in ArcMap. You should be able to visually discern the differences in the locations of the shapefiles. In my experience, the difference has been anywhere from 1-5 ft. of a shift.
 9. Right-click on the shapefile in the Table of Contents...Data... *Export Data*
 10. Browse to where you would like to save the new shapefile, input a unique name, and click *Save*. Click *OK*. Click *No* when asked if you want to save the exported data to the map.


The shapefile that you just created is ready for use in Trimble Access. Go to Part II.

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Import an existing shapefile into Trimble Access

For Existing GIS shapefiles:

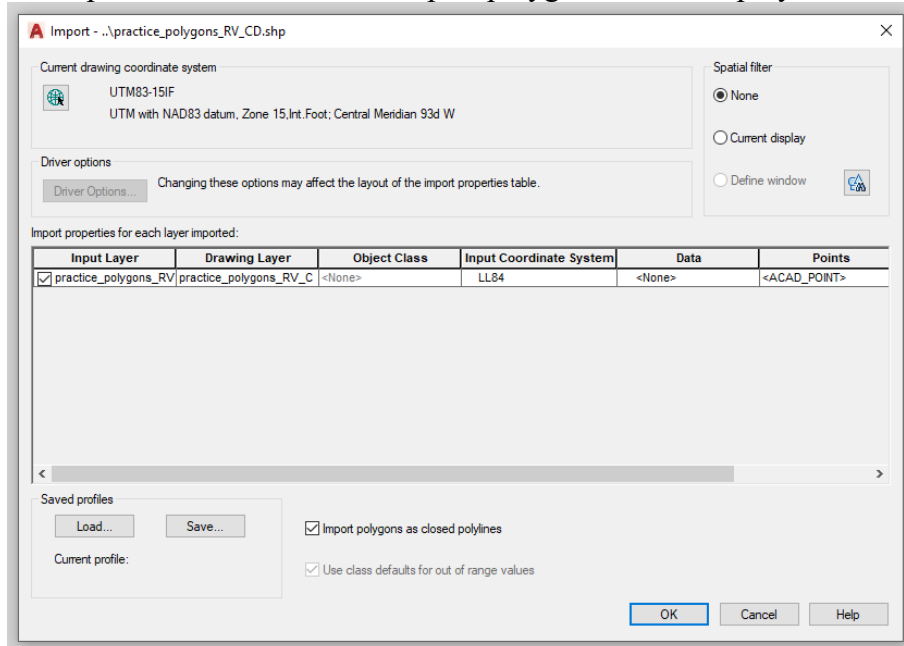
Method 1 – Transform Projection in ArcMap

1. In ArcMap, Navigate to *ArcToolbox* → *Data Management Tools* → *Projections and Transformations* → double-click *Project*. The *Project* dialogue box should appear.
2. Pick your shapefile from the dropdown menu. For ArcMap created files, the *Input Coordinate System* should read: *NAD_1983_UTM_Zone_15N*
3. Choose where you would like to save your transformed shapefile and give it a unique name. Click *Save*.
4. Click the icon next to *Output Coordinate System* to pick the coordinate system you wish to transform the shapefile into.
 - a. Click the down arrow to the right of the globe (), select *Import* and browse into the folder where you have saved the Iowa NRCS projection.
 - b. Select *NRCS_IA_UTMif.prj* and Click *Add*. Click *OK*.
5. Once you have selected the *Output Coordinate System*, ignore all the other options in the dialogue box and click *OK* at the bottom of the screen.
6. Once the operation has successfully completed, the new shapefile will display in ArcMap.
7. Exit out of ArcMap.

The shapefile that you just created is ready for use in Trimble Access.

Method 2 – Change Coordinate System in AutoCAD

1. In Civil 3D type MAPIMPORT and hit enter
2. Browse to and select the shapefile that you would like to import and click OK
3. On the import screen, checkmark Import polygons as closed polylines and click OK



4. Once that has imported, type in MAPEXPORT and hit enter

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5. Browse to where you would like to save the new shapefile, input a unique name, and click OK
6. Select the Object type, choose the Select Manually option, click the icon and draw a polygon around the features you would like to select. Hit Enter
7. On the Data tab, click Select Attributes, checkmark next to Properties, Click OK
8. On the Options tab, verify that the coordinate conversion reads UTM83-15IF and click OK

The shapefile that you just created is ready for use in Trimble Access. Go to **Part II**.

Part II

Transfer point files to Trimble device.

- ◆ This process transfers shapefiles to the Trimble controller and makes the data available for staking.

Copy the shapefile to the Trimble controller:

On T10 or TSC7 controller

- 1) Power on T10 or TSC7.

On computer



- 2) Open a File Explorer screen and browse to the location of the shapefile to be copied.
- 3) Select all the files associated with the shape file. Transfer them to the data collector.

Use the **HowTo - Transfer Files Between Windows Devices 2023** steps to transfer the shapefile to the T10 or TSC7.


- 4) In the Explorer screen for the data collector browse to *C:\ProgramData\Trimble Data\Projects\YourProjectName*
- 5) Paste the uploaded files into your project folder.

Create the staking job and link the shapefile in Trimble Access:

On TSC7 or T10 Controller

- 6) Tap the **Trimble** button  or Tap *Start... Trimble Access*.
- 7) Tap an existing Project and Tap *Open* or Tap *New*, Input a new project name and Tap *Create*.
- 8) Tap on *Jobs... New Job*
- 9) Input the new *Job name*
- 10) Set Template as *nrcs-gps (or nrcs-tstat for a Total Station)*
- 11) Verify that the *Coordinate system* and *Units* are correct.
- 12) Tap Accept.
- 13) Tap *Layer manager*  ... *Map files*


If linked shape file does not appear, Tap *Browse* and navigate to where you pasted the shape file. Tap the shape file to make it appear in the *Map files* list.

A check mark inside a square  indicates the points in the file are visible and selectable.


- 14) Tap Accept.

The points will show up in the **Map** and can be used for staking.

Stakeout Points

1. Tap 
2. Tap *Stakeout*
3. Tap the appropriate network E.g. *IARTN_R12*.
4. Tap *Points*
5. Tap *Add*
6. Tap *Select from list*

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7. If linked points do not appear, Tap Filter and checkmark Linked File Points. Tap Accept.
8. Tap on the names in the list to Checkmark them. Tap Add
9. Highlight the point to stake
10. Tap Stakeout
11. Follow directions to location of point. If you want to see the direction arrow and it is not visible, drag the  to the left until the direction arrow appears.
12. Once Target is at acceptable location Tap Measure.
13. Input As-staked Name E.g {SO1004} for StakeOut and a *As-staked code*.
14. Tap Enter
15. Tap Store
16. Select next point from list and repeat.
17. When done with Stakeout Tap ESC.

Recheck Control Points

18. Before ending the survey, **return to the control points** and take a 2nd shot on those points. Compare the coordinates to the earlier results.