MAINTENANCE RATING PROGRAM

FIELD DATA COLLECTION MANUAL

KENTUCKY TRANSPORTATION CABINET
Division of Maintenance
Operations and Pavement Management Branch
May 2006

KENTUCKY TRANSPORTATION CABINET

Kentucky UNBRIDLED SPIRIT

MAINTENANCE RATING PROGRAM

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INTRODUCTION

Maintenance Rating Program

The Maintenance Rating Program is a key part of the cabinet-wide effort to use performance measurement data to make management decisions based on facts. The results will be used not only to assess accountability but also to provide guidance in resource allocation and investment decisions. Our goal is to maintain a level of service that meets or exceeds our customer expectations, and to deliver that level of service consistently across the Commonwealth.

NECESSARY EQUIPMENT

☒Clipboard and pencils
☒MRP inspection forms
☒Rolling wheel measure
☒Upside down spray paint cans (colors specified for each wave)
☒Rut measuring rod (6 ft. long straight 1” x 1” piece of aluminum)
☒Ruler (6 inch or longer)
☒Reflectometer for striping (if possible)
☒Traffic paddles
☒Safety vest for each inspection team member
☒DMI equipped vehicle with flashing lights for each inspection team
☒Route log

PROCEDURE

- The sampling unit will be a 500 foot roadway segment, including all adjacent right-of-way.
- Make sure there is not a bridge or other structure, a large intersection, or a construction zone within the segment. If there is, the team will move forward (in the direction the segment runs) to the beginning point of the first clear section (no bridges, intersections, or construction zones). If a construction zone is so long that the team reaches another sample segment before becoming clear, they should note that in the bottom margin of the form and skip the segment.
- The inspection team must constantly be aware of their **safety** and the **safety of the traveling public.** Each team member must wear a safety vest when outside their vehicle at an inspection site.
- The inspection team should mark the beginning mile point (the starting point of the segment) with paint on the edge of the pavement. Then, in the specified direction, the team should mark every 100 feet.
- Unless a direction is noted on the inspection form, measurements and observations should be done on both sides of the roadway segment. If a direction is noted, measurements and observations should be done only in that direction (usually Interstates and Parkways).
- To avoid recording in the wrong line on the inspection form, do not skip lines or leave them blank. Always write “0” when there is no measure to be recorded. NEVER RECORD “N/A” OR A DASH ON THE FORM.

ROADWAY GENERAL

General Aesthetics

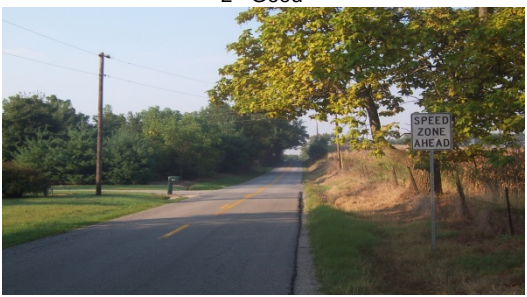
(r1) General Aesthetics

This item refers to the general appearance (pleasantness) of the roadway and roadside to the public at large. This includes potholes, cracking, height and uniformity of grass, noxious weeds, unsightly patching, uneven stripes, leaning signs, litter, rusting or broken guardrail, shoulder failures, etc.

1 = Excellent

General Aesthetics Cont'd

2= Good



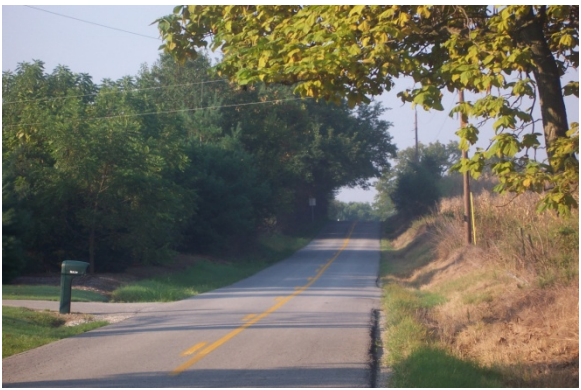
3=Acceptable

General Aesthetics Cont'd

4=Poor

5= Unacceptable

Roadway/Shoulder Obstructions



(r2) Is there roadway or shoulder with less than 15' vertical clearance?

The roadway and shoulders should be free of any canopy (tree or other vegetation) or other obstructions for a minimum height of 15 feet.

Circle **Y** if there is any roadway in the section with less than 15 feet of vertical clearance.

Visual Obstructions

(r3) Are there visual obstructions of intersections, curves or signs, etc.?

This item refers to either horizontal or vertical visual obstructions at intersections, curves, signs, etc. This could be due to vegetation.

Circle **Y** if there are visual obstructions of roadway, intersections, curves or signs in the section.

Right-of-Way Fence

(r4) Is there right-of-way fencing?
Circle **Y** if there is fence in the section.

(r5) Is there fence not allowing access to the roadway?
The fences on limited access highways (Interstate/Parkways) should provide effective barriers to deny access.

Check right-of-way fence for breaks, holes, rusting out, down or totally missing. Vines on a fence or brush growing in a fence can still provide an effective barrier. Circle **Y** if the section has fence that is broken, has holes or is completely missing (that fails to provide a positive barrier).

Guardrail

(r6) Is there guardrail?

Circle **Y** if there is guardrail in the segment.

(r7) Is there guardrail outside height specifications (25" to 29")?

Guardrail that has a height less than 25" or greater than 29" is considered to be outside specifications.

Circle **Y** if the section has guardrail that is outside of specifications. The height of guardrail should be measured with respect to the near edge of the road or shoulder. Outdated end treatments do not need to be counted as guardrail that is outside specifications.

Guardrail Cont'd

(r8) Is there guardrail with post or accident damage?

Guardrail can be damaged due to vehicular hits or other factors.

Circle **Y** if the section has guardrail that is damaged to the extent that structural integrity or functionality is lost.

Guardrail Cont'd

(r9) Number of guardrail attenuators/rail ends

Count and record the total number of attenuators/end treatments. Include the guardrail radius as an end treatment.

(r10) Number of attenuators/rail ends damaged

Attenuators damaged due to vehicular hits or other factors.

Count and record the total number of attenuators/end treatments that are damaged to the extent that structural integrity or functionality is lost.

PAVEMENTS

Pavement Potholes

(p1) Number of pavement potholes 6” long, 6” wide and 1” deep or larger

A pothole is a bowl shaped hole or depression in the pavement surface. The surface may have broken into small pieces due to cracking or localized disintegration and the material removed by traffic.

Count each pothole that measures 6”x6”x1” or larger. Potholes smaller than the minimum size are not counted as deficiencies. If a section contains more than 20 potholes then just record 20.

Rutting

(p2) Rutting – Outside wheel path at 0 feet
(p3) Rutting – Outside wheel path at 100 feet

A rut is a surface depression of the pavement in the wheel paths. Ruts may be more noticeable after rainfall when wheel paths are filled with water.

A straightedge (60" long) is laid across the outside wheel path in the right lane and ruts are measured in 1/4" increments. Circle the appropriate rut measurement at the beginning of the section on line **(p2)** and at the 100' location on line **(p3)**.

SHOULDERS

Pavement Drop Off to Shoulder

(s1) Is there pavement drop off to shoulder greater than or equal to 1.5"?

Lane/shoulder drop off occurs wherever there is a decrease in elevation between the traffic lane and the shoulder. It may be due to consolidation, displacement or settlement of underlying material. The absence of any shoulder would be counted as lane/shoulder drop off.

Measure approximately 6" from edge of driving lane. If drop off is greater than 1.5" circle **Y**.

Shoulder Drop Off to Ground

(s2) Is there shoulder drop off to ground greater than or equal to 3.0"?

Drop off is the elevation decrease between the improved shoulder and adjacent ground at the outside edge of the shoulder. It could be due to consolidation of material, erosion, run off or other factors.

Measure at the edge of shoulder and if the drop off is 3" or more circle **Y**.

High Shoulder

(s3) Is there high shoulder?

High shoulder is the opposite of pavement drop off to shoulder. It can be caused by frost heave, swelling soils, unmowed grass or other factors. High shoulder creates ponding of water on pavement.

Circle **Y** if the section has any shoulder that is higher than the adjacent pavement which would cause ponding of water on the pavement.

Shoulder Potholes

(s4) Number of shoulder potholes 6” x 6” x 1” or larger

A pothole is a bowl shaped hole or depression in the shoulder surface. The surface may have broken into small pieces due to cracking or localized disintegration and the material removed by traffic.

Count each pothole that measures 6”x6”x1” or larger and record. Potholes smaller than the minimum size (6”x6”x1”) are not counted as deficiencies. If a section contains more than 20 shoulder potholes then just record 20.

DRAINAGE

Drainage Structure Damaged or Blocked

(d1) Number of drainage structures

Count the number of drainage structures in the segment and record. Do not count edge drains.

Drainage Structure Damaged or Blocked Cont'd

(d2) Number of drainage structures with 25% or greater flow inhibited

Drainage structures, like pipes and culverts, should be free of obstruction and in good working order.

Measure the total number of drainage structures encountered in the test section. For each of these structures, estimate the percentage of flow area inhibited on the worst end of the drainage structure and record the number of structures with 25% or greater flow inhibited. **Entrance pipes along a ditch should not be included in this section, but if blocked, they should be counted as ditch obstructions in the "Ditch's Flow Inhibited" section.**

Ditches

(d3) Are there ditches?

Circle **Y** if the section has ditch on either side of the road. Include cross slope ditch.

(d4) Are there ditches with flow inhibited?

Water flow in the ditches (paved or unpaved) on the side of the road should be unobstructed by blockages or damage.

Ditches Cont'd

Blocked entrance pipes along the ditch should be included as a ditch obstruction. Circle **Y** if there is any blockage of ditches or entrance pipes along the ditch that inhibit water flow.

Curbs and Gutters

(d5) Are there curbs and gutters?

Circle **Y** if the section has any curbs and gutters.

(d6) Are there curbs and gutters with flow inhibited?

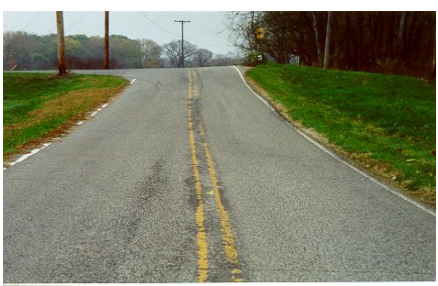
Water flow in the curbs and gutters should not be obstructed by blockages or damage. Circle **Y** if the section has obstructions of curbs and gutters that inhibit water flow.

TRAFFIC

Striping Reflectivity

Good Stripe

Poor Stripe



(t1 thru t6) Striping reflectivity measurements

Striping should be reflective at night to provide positive guidance to the motorist.

Take three readings per section for each color with an LTL 2000 Retroreflectometer. Lines to be measured should be chosen in order of priority as follows: edge line, center line, and lane line. On solid lines, take the first reading at the beginning of the section, with subsequent readings taken at ten pace intervals. On skip lines, take three readings, one per skip, in the center of the skip. Readings should only be taken at locations on the pavement that will provide a representative sampling of the striping.

Guide Sign Faces

(t7) Number of guide signs

Guide sign faces include route markers (cardinal directions, route numbers, arrows), distance/destination signs, and directional signs (green, brown or blue backgrounds)
Enter the number of guide sign faces within the section.

Guide Sign Faces Cont'd

(t8) Number of guide signs not conforming with specifications

In order to meet the specifications, the sign face should be free from any obvious, visible defect that would detract from its effectiveness under night-time conditions. Examples of obvious defects include graffiti, bumper stickers, bullet holes, delamination, missing letters or substantial fading. Record the number of guide sign faces that do not conform to specifications.

Guide Sign Assemblies

(t9) Number of guide sign assemblies

A guide sign assembly consists of a sign or signs on one or more connected posts. The picture above shows one assembly with thirteen guide signs. Enter the number of guide sign assemblies within the segment.

Guide Sign Assemblies Cont'd

(t10) Number of guide sign assemblies not conforming to specifications

In order to meet the specifications, the sign assembly should not be leaning more than 22.5 ^{o} in any direction. There should be no bolts or rivets missing. No sign face should be turned more than 45^{o} from the line of sight to the traffic flow. Sign posts should not extend from the top of any sign face. The minimum height from the pavement edge extended to the bottom of the lowest sign face should be no less than 5 feet in rural areas and 7 feet in urban areas (sidewalks) and on all fully controlled access highways. If any of these criteria are not met, the sign assembly does not conform to specifications and should be recorded.

Regulatory and Warning Sign Faces

(t11) Number of warning and regulatory signs

Regulatory sign faces include STOP, WRONG WAY, DO NOT ENTER, SPEED LIMITS, ETC. They have either red or white backgrounds. Warning sign faces include STOP AHEAD, curve warning signs, chevrons, NO PASSING ZONE pennants, and other signs with yellow backgrounds. Enter the number of regulatory and warning sign faces within the segment.

Regulatory and Warning Sign Faces Cont'd

(t12) Number of warning and regulatory signs not conforming with sign face specifications

In order to meet the specifications, the sign face should be free from any obvious, visible defect that would detract from its effectiveness under night-time conditions. Examples of obvious defects include graffiti, bumper stickers, bullet holes, delamination, missing letters or substantial fading. Record the number failing to meet specification.

Regulatory and Warning Sign Assemblies

(t13) Number of regulatory and warning sign assemblies

A regulatory and warning sign assembly consists of a sign or signs on one or more connected posts. A STOP sign on one post is considered the same as curve warning signs with an advisory speed sign on two connected posts. Enter the number of regulatory and warning sign assemblies.

Regulatory and Warning Sign Assemblies Cont'd

(t14) Number of regulatory and warning sign assemblies not conforming to specifications

In order to meet the specifications, the sign assembly should not be leaning more than 22.5 ^{o} in any direction. There should be no bolts or rivets missing. No sign face should be turned more than 45^{o} from the line of sight to the traffic flow. Sign posts should not extend from the top of any sign face. The minimum height from the pavement edge extended to the bottom of the lowest sign face should be no less than 5 feet in rural areas and 7 feet in urban areas (sidewalks) and on all fully controlled access highways. If a secondary sign (advisory speed plate, parking restriction sign, etc.) is used, the minimum distance to the bottom of the lowest sign faces should be 4 feet and 6 feet respectively. If any of these criteria are not met, the sign assembly does not conform to specifications. Record the number that fails to conform.

Maintenance Rating Program (MRP) Mobile Application

Introduction

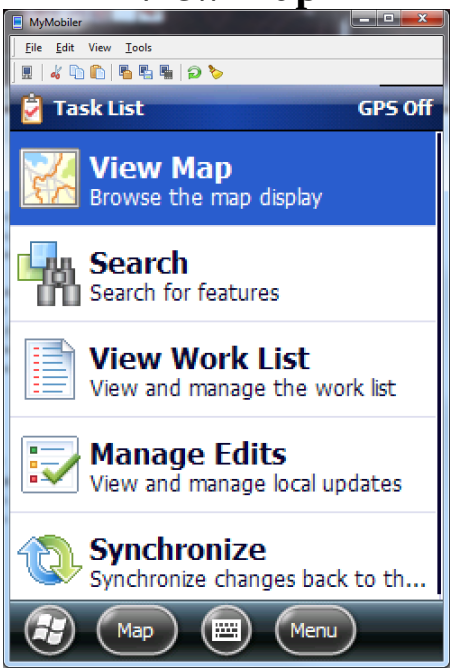
This tutorial is designed to assist customers who will be using the Trimble Juno with ArcGIS Mobile and the MRP Application

If you have any questions what so ever please feel free to contact the GIS team with any questions

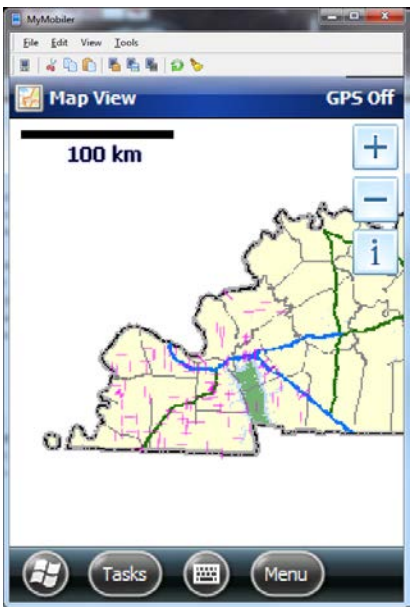
Andrew.McKinney@ky.gov

502-782-3717

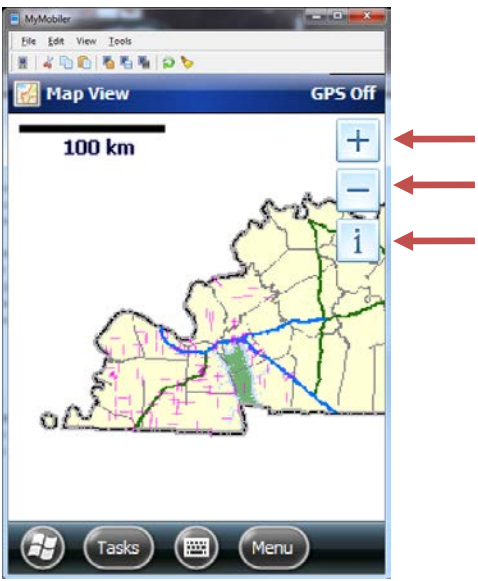
Tasks
View Map



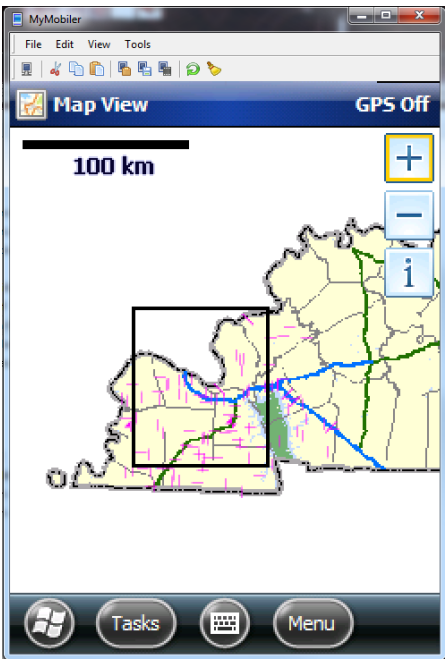
When you tap View Map you will go into the map at the last place you were before you closed the application



There are three buttons on the main map screen. Zoom-in, Zoom-out, and Identify. If you tap on one it will select. Zoom-in has been selected here.



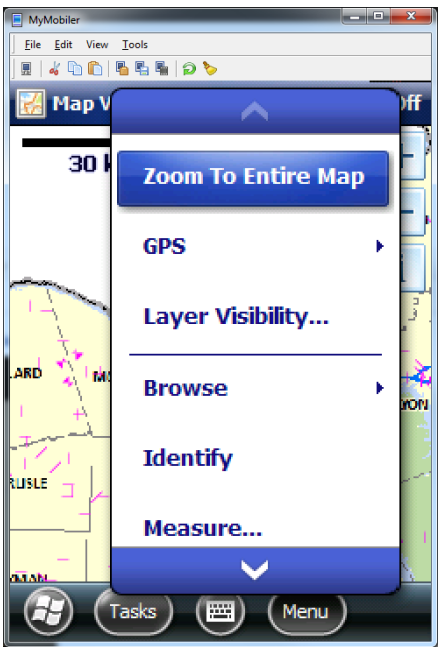
Tap and hold the stylus on the screen at one corner and drag to draw a box. The box you draw will zoom you to that extent.



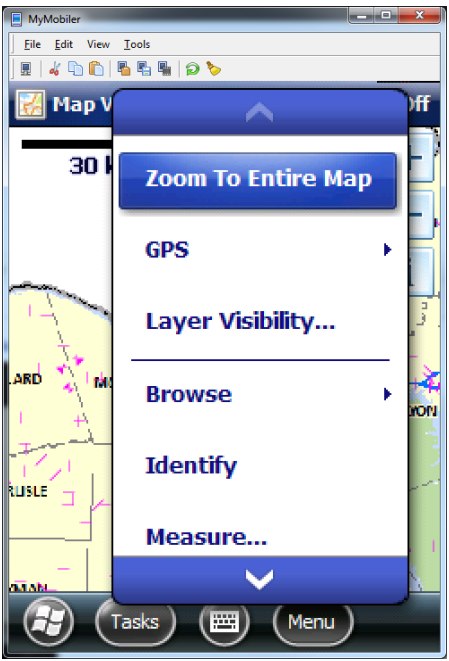
You'll notice that the map zooms into the area you drew. The Zoom Button is no longer selected so if you want to zoom in more you will have to click it again. Zoom-out handles the same way.

If you tap on the screen and drag similar to the way you did before the screen will pan to the opposite direction.

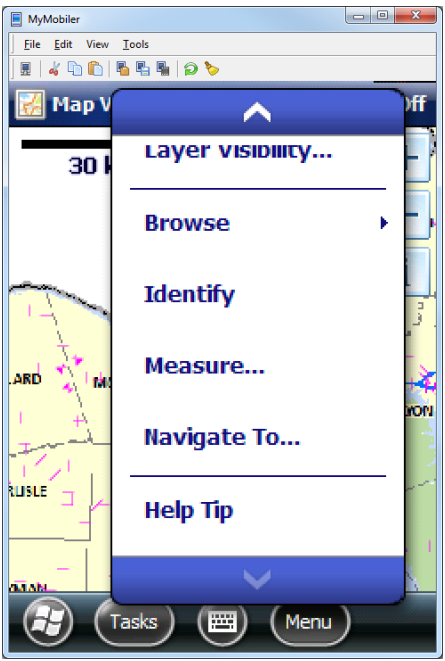
You will get various options when you tap the menu button in the lower right hand corner. You can also use the physical button on the Trimble Juno.



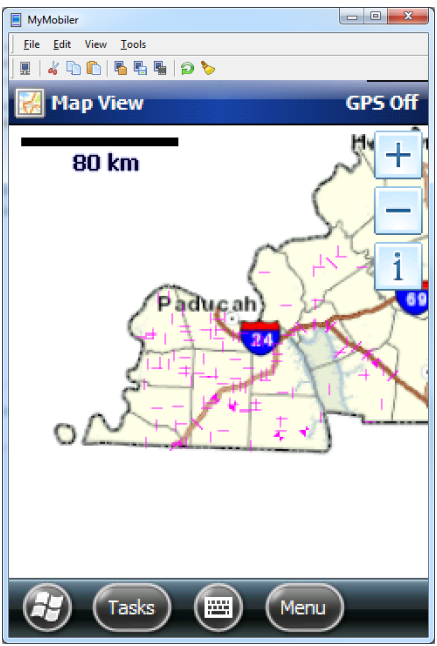
Zoom to Entire map will bring you all the way out to the state.



You are able to scroll down for more

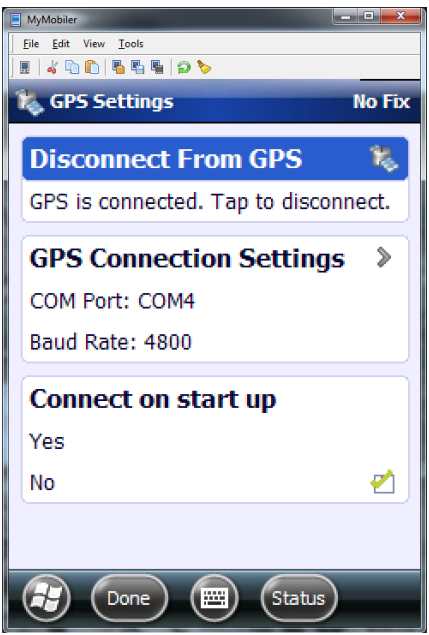


To turn the GPS on click the GPS Off button in the upper right hand corner



In the GPS Status screen, click Connect to GPS if it's not already connected.

It will now say Disconnect From GPS. It will also now say No Fix in the upper right hand corner until you get a good signal. Tap Done to go back to the Map.



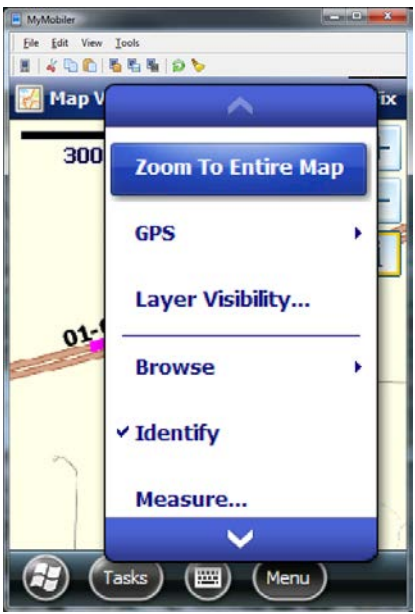
You will see a Red Exclamation Mark on your screen and see “No Fix” in the upper right hand corner until you get enough satellites to get a fix.

TIP: You do not need a GPS Signal in order to collect inspection data. You do not even have to have the GPS on.

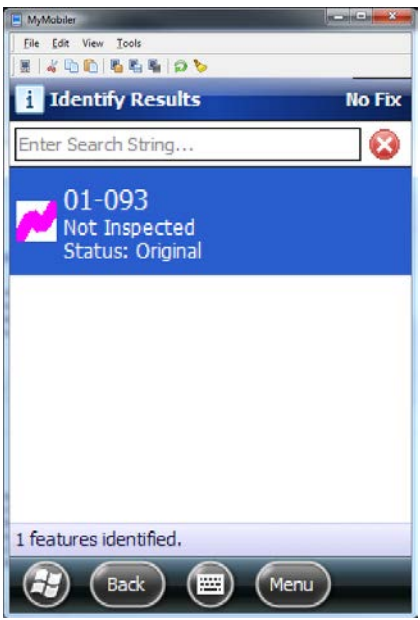
Identify Tool

If you zoom in close enough the Sheet Numbers will label. If you want more information about the section the third button on the main map is the Identify button. If you tap this it becomes active.

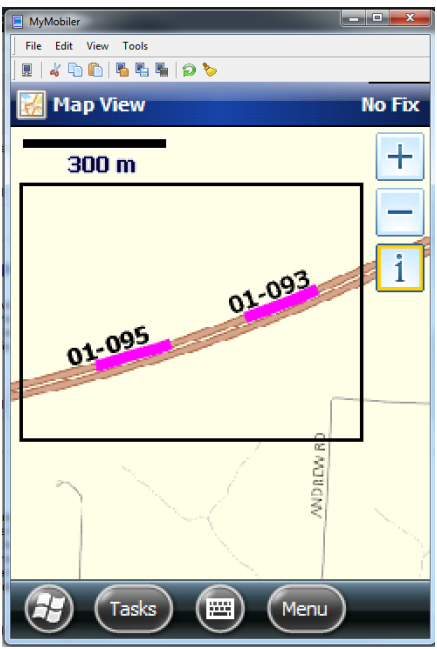
Tapping the Menu button while Identify is active you will notice that there is a check mark next to Identify.



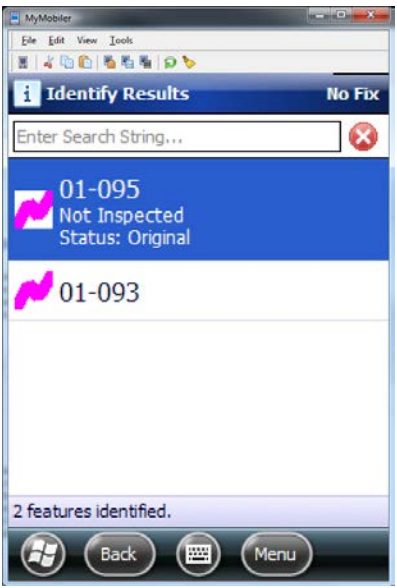
Tapping on a section while Identify is active will bring up the section information.



Instead of just tapping on a section you can also draw a box around a section or sections like you would using one of the zoom tools.

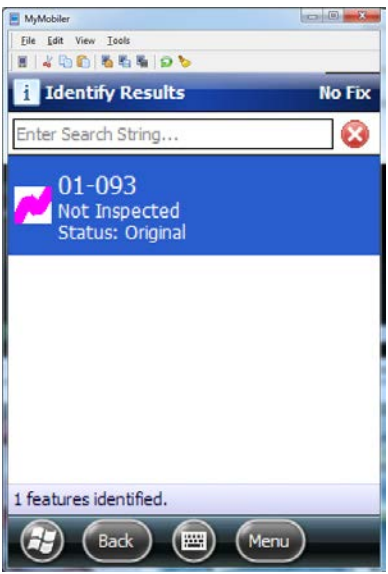


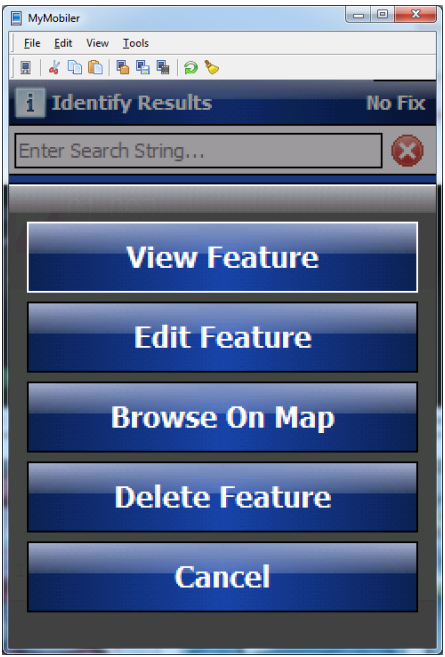
You will then see all of the sections that were inside the box you drew.



The Identify tool, unlike the zoom tools, will stay active until you turn it off by either tapping the i or going to menu and tapping “Identify”.

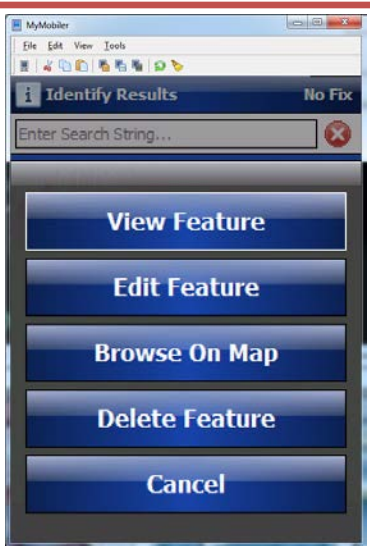
After you have Identified the section you want, tap on the section and you will get more information that you see below.



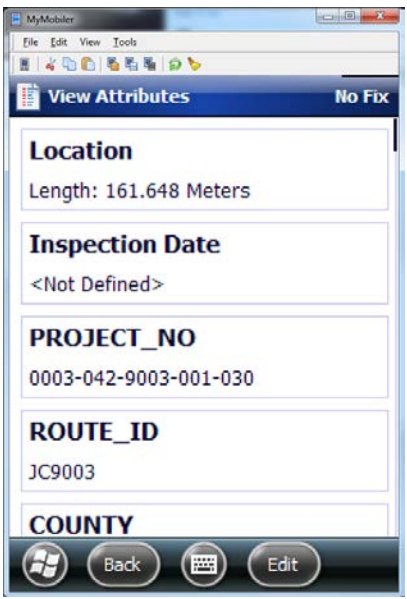

MyMobiler
File Edit View Tools
Identify Results
No Fix
Enter Search String...
View Feature
Edit Feature
Browse On Map
Delete Feature
Cancel

Starting an Inspection

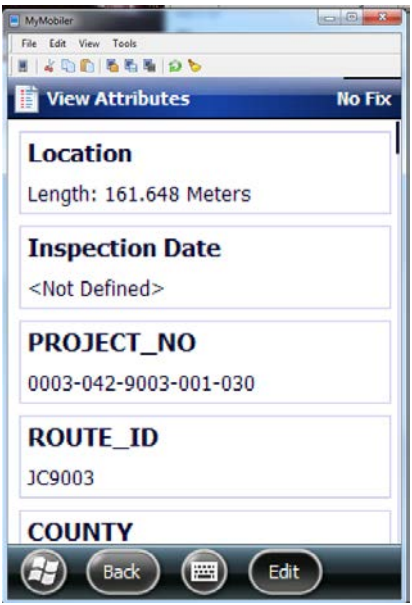
From here you can View the Attribute information for that section, Edit the data in section, locate it on the map, add it to the work list, and delete (please don't do this)



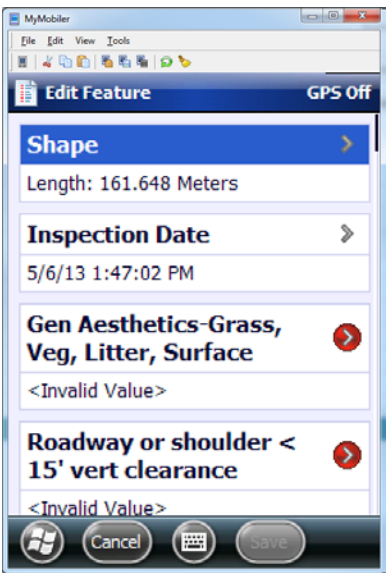
After tapping View Attributes, you will get all of the attribute information for that section. You can scroll through by tapping and holding on the screen and moving the stylus up and down.



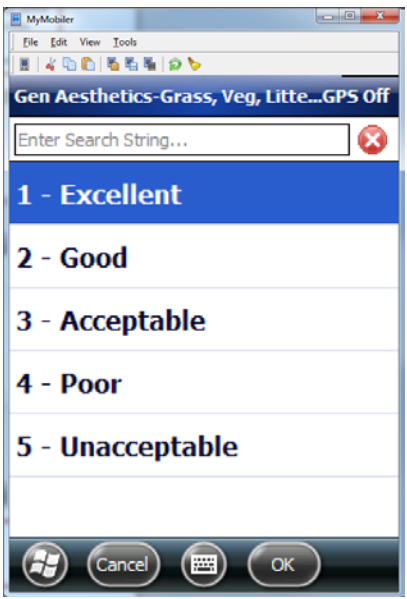
If you tap the Edit button you will go into the edit mode. This will be the start of that inspection. You can also go right into editing by clicking Edit Feature like you see in the previous screen.



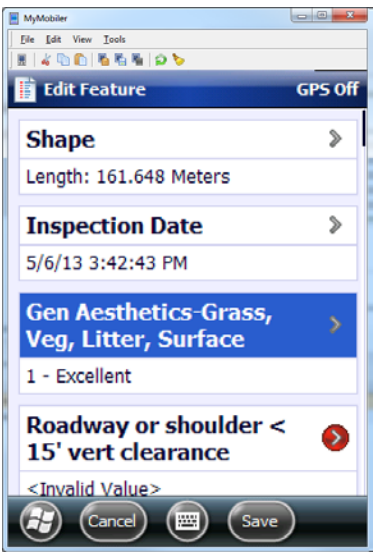
You will now see all of the attributes that are editable for the MRP Sections.
Everything with a Red Dot next to it will need to be filled out. You can scroll through this the same way as the other attributes. Inspection date should already be filled out.



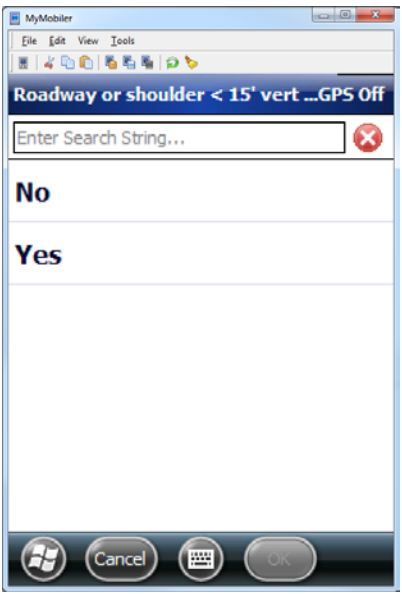
If you tap on an Attribute (Question) you will go into another window that gives the options to select for that attribute.



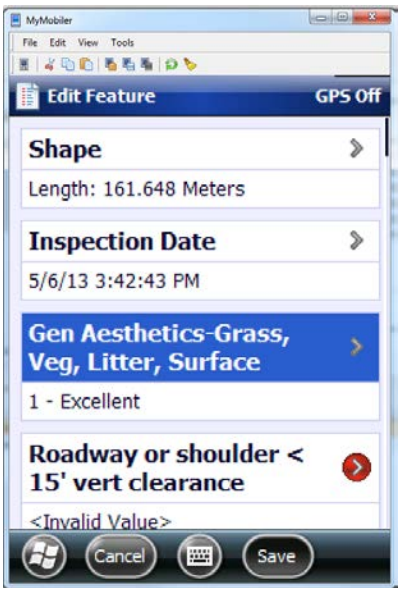
Once you select one of the options you will go back to the Edit Attributes Menu and the Red Dot will no longer be there. Click on the next question.



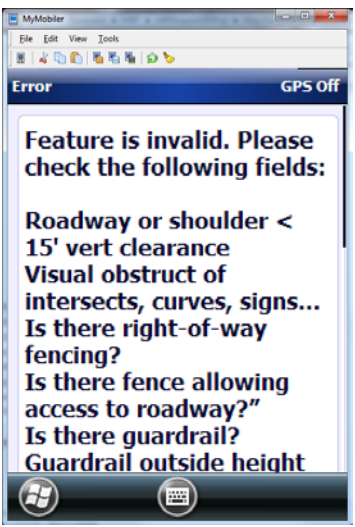
From here you can enter in the inspection information. After you click an answer it will take you back to the Attributes Screen.



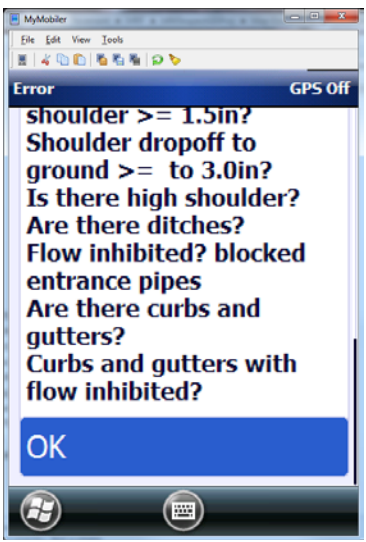
If you hit save prematurely before all of the attributes are filled out you will get an error.



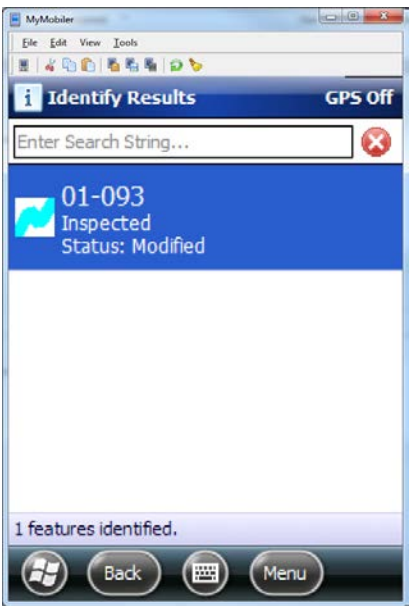
This error corresponds to the red dots next to the questions. Once they are all filled out you will be able to select save.



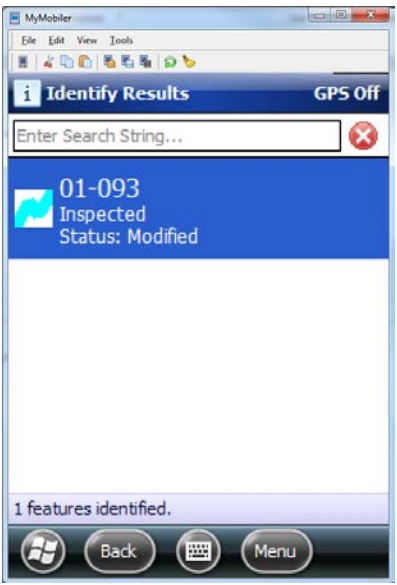
You will have to scroll down to the bottom and click OK.



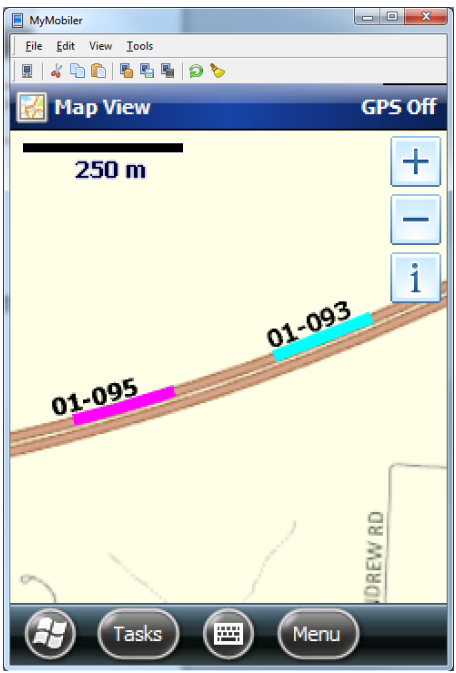
The section should now be green, show inspected, and modified.



If you click back now you will go back to the map.

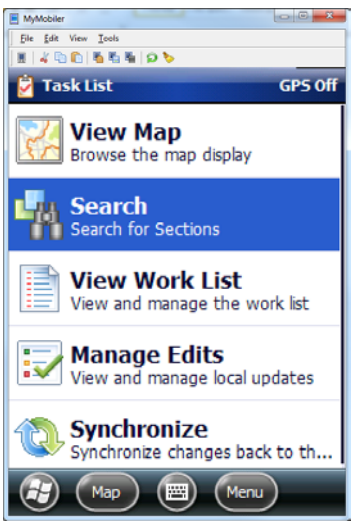


You will see the section on the map is now blue as well.

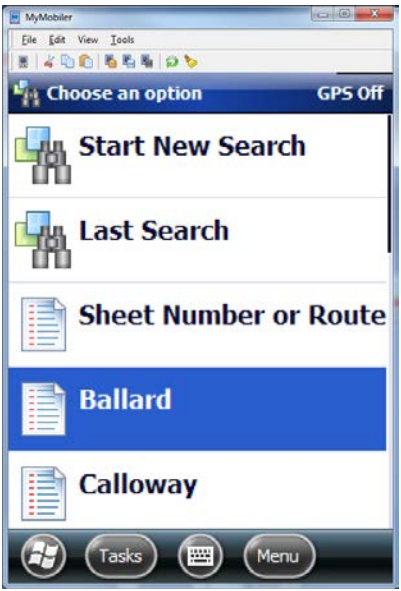


Working with Search

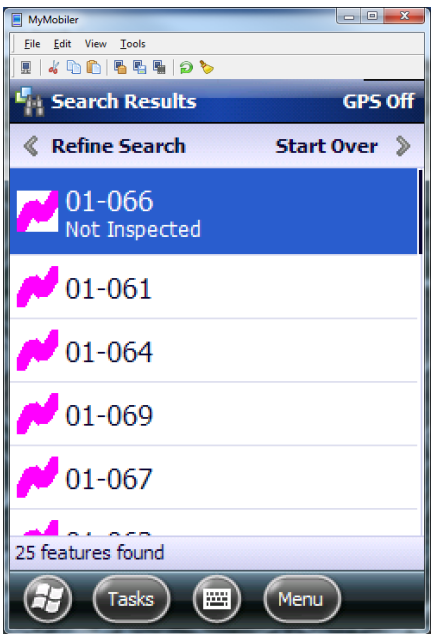
Tap the Search Task



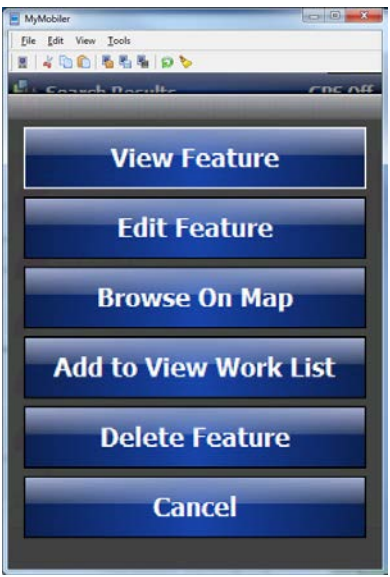
Some canned searches have been created for you. If you tap on a county name all of the sections for that county will come up. **DO NOT CLICK ON START NEW OR LAST SEARCH**



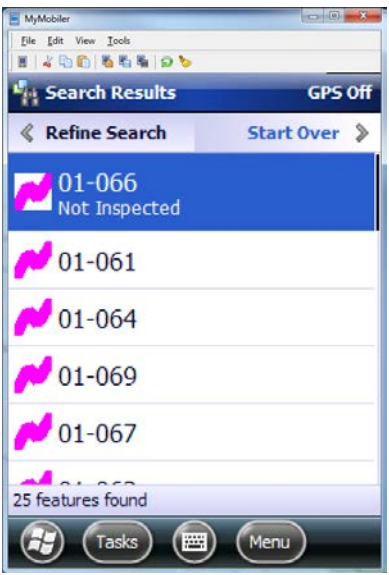
After clicking Ballard all of the sections for that county will show up.



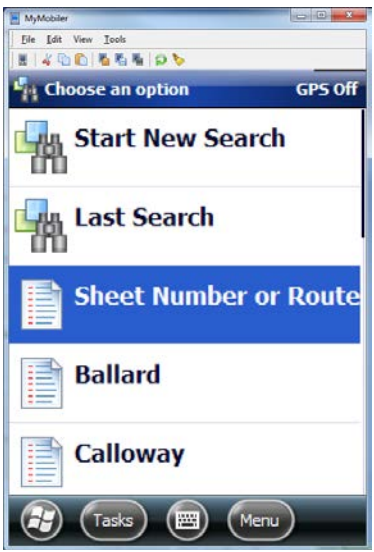
Clicking on a section will allow you to view its data, starting editing the data, show on the map, or add it to your worklist for easy access.



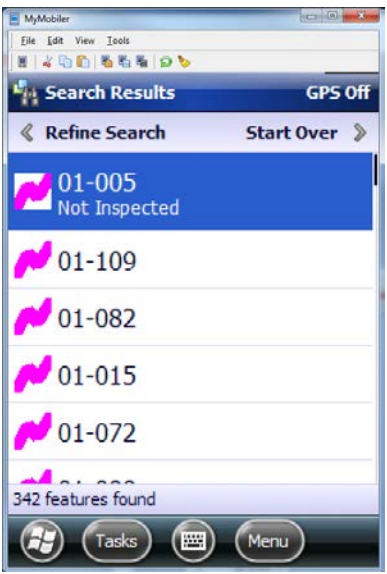
Clicking Start over in the upper left will bring you back to the Search Menu.



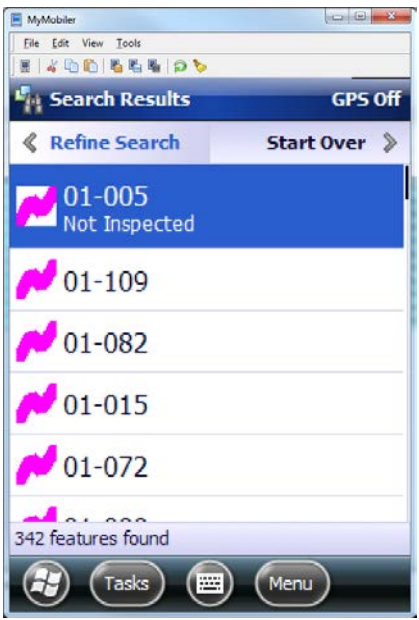
You also have another option where you can search for Sheet number or Route. **Again do not click on Start New or Last Search.**



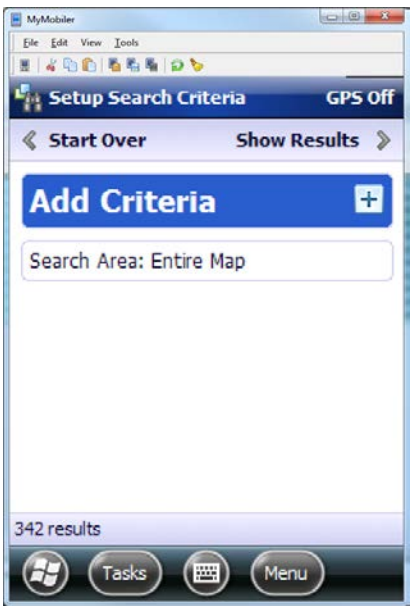
Clicking on Sheet Number of Route will give you all of the sections in the district.



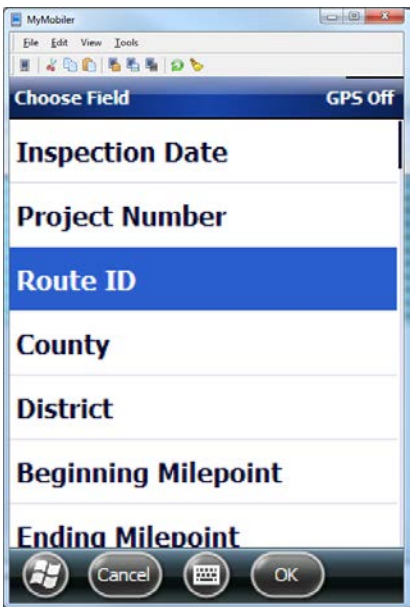
To narrow down to sheet or route click Refine Search in the upper left hand corner.



Click Add Criteria



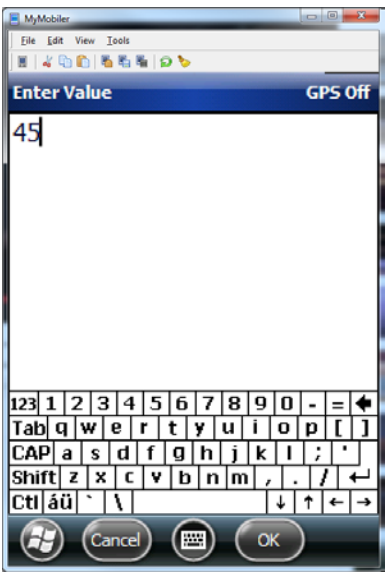
To Search for a specific Route click Route ID.



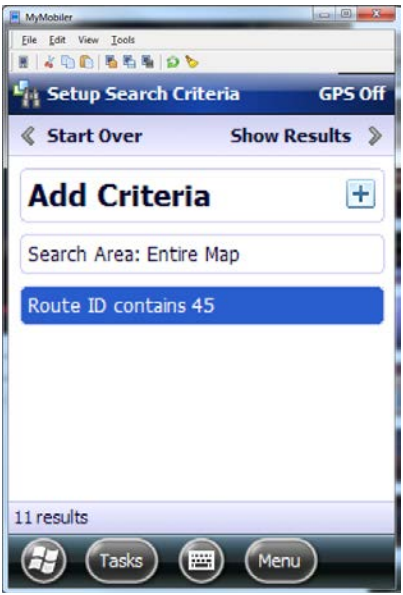
Click Like


MyMobiler
File Edit View Tools
Choose Option
GPS Off
Equals
Not Equals
Not Defined
Like
Cancel
OK

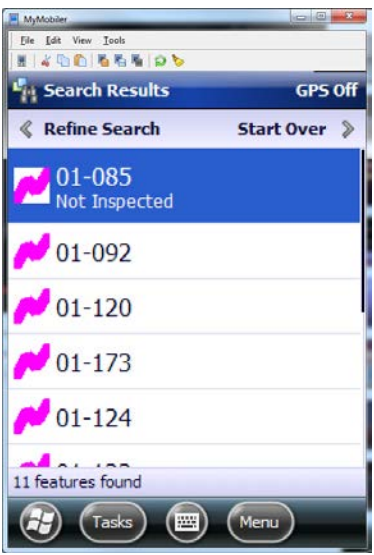
For this Example I'm searching for all Routes on US 45 so I typed in 45 and clicked ok.



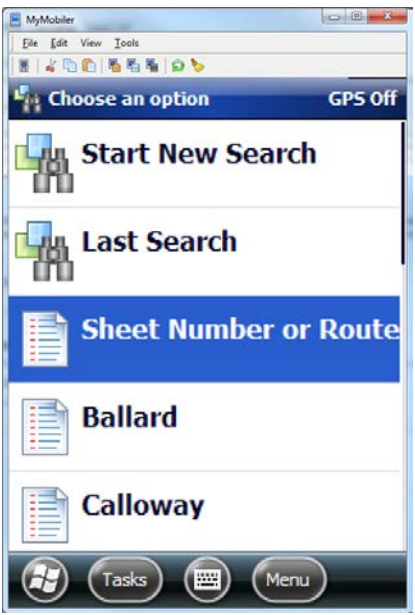
It should tell you how many sections it found in the lower left. To see the list of sections click Show Results in the upper right hand corner.



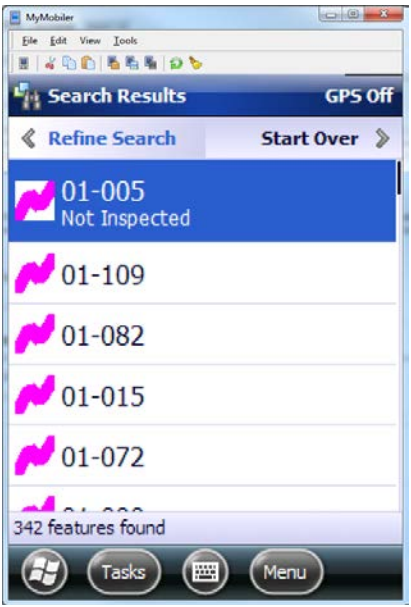
From here you can click a section just like in previous steps or add them all to your workspace.



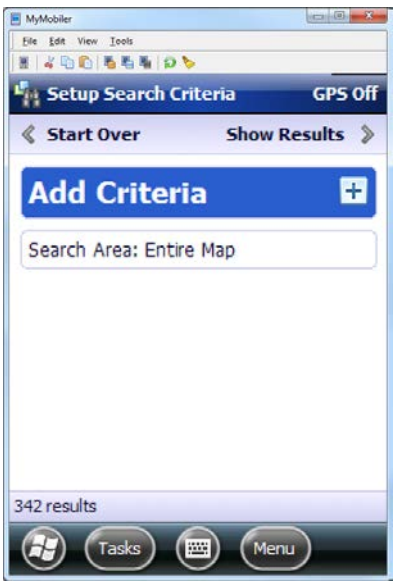
To Search for Sheet Number you will Click Sheet Number or Route, again.



Click Refine search in the upper left hand corner.



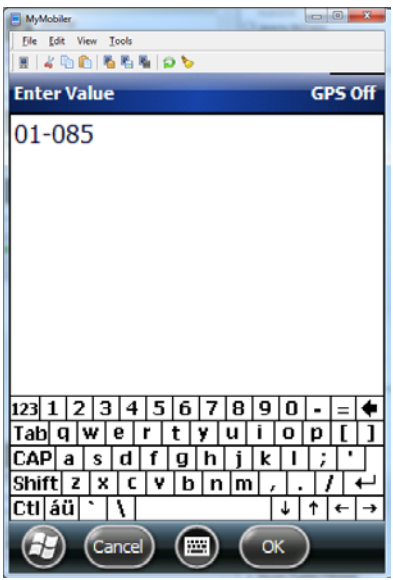
Click on Add Criteria



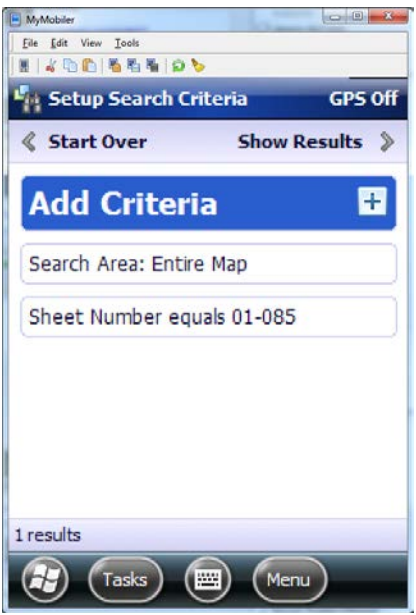
Click on Sheet Number

Click on Equals

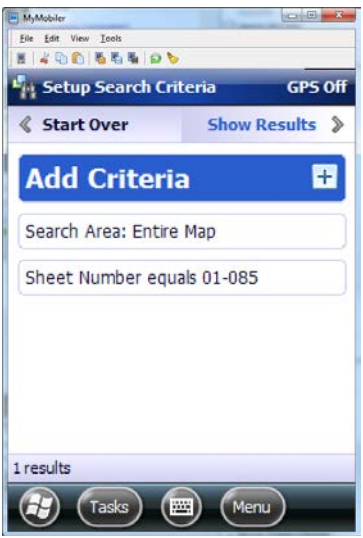
Type in the Sheet Number you want to find and click OK.



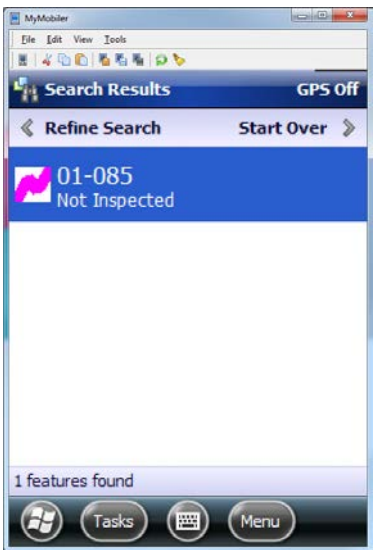
You will see in the lower left that 1 result was found.



Click Show Results in the upper right hand corner.

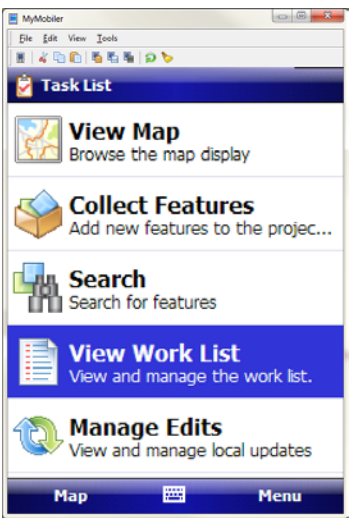


You will see your section and from here you can view the attributes, inspect it by editing the section or add it to your worklist.

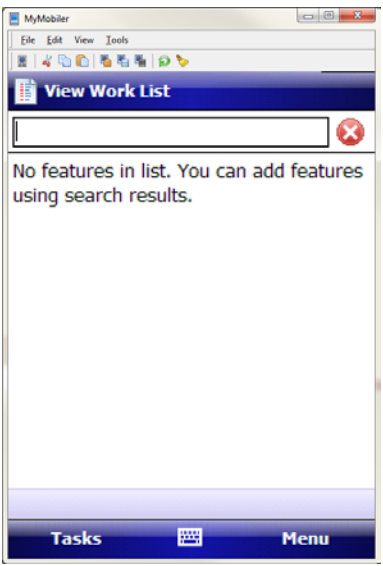


View Work List

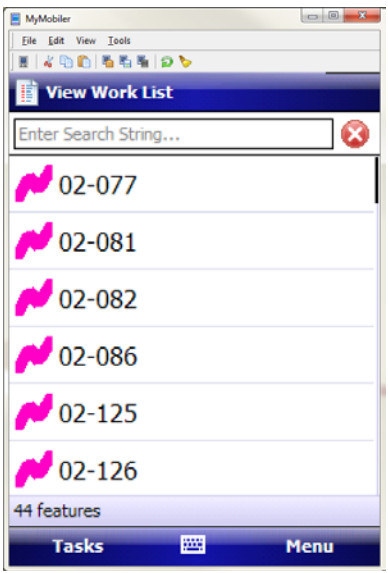
The next task is the View Work list.



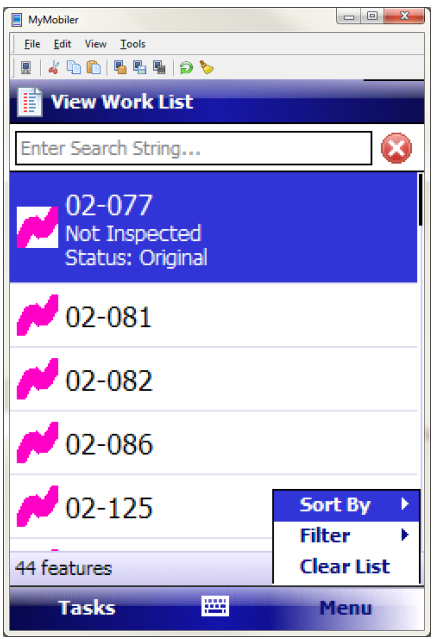
I do not have anything in my work list but anything you have added to the work list will show up here.



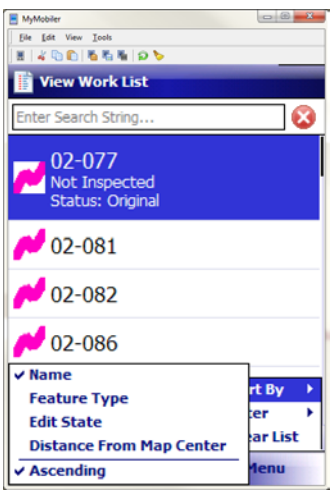
This is what it looks like with data in the Work List.



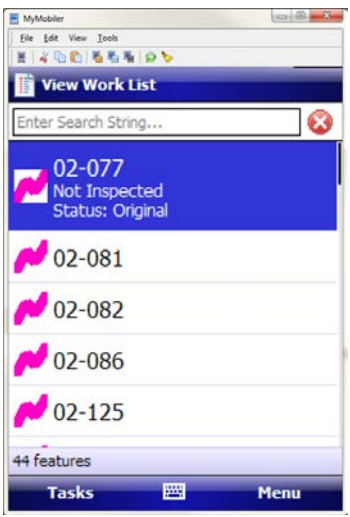
The Menu button will give you ways to sort by, filter and clear the list.



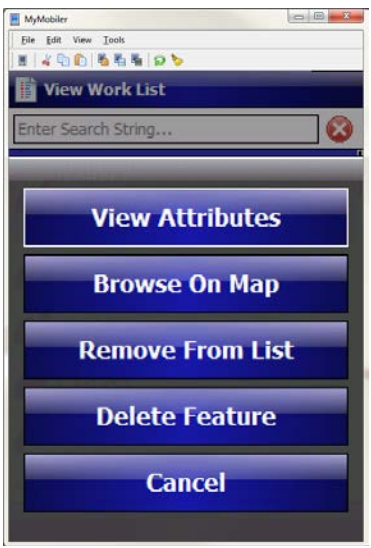
The sort gives you options of sorting the features. Try them out to see how they are handled. Distance from Map center is a good way to see the next closest section, but this is as the crow flies and not based on the road network so you may have to make sure of that.



Scrolling through the data will show you the current status

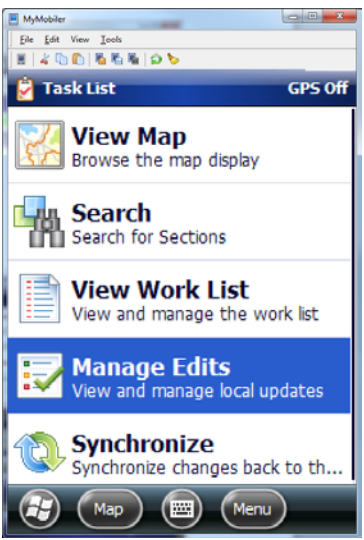


Tapping on a Section will pull up familiar information. Here you can View the Attribute information, Locate on the map, remove it from your work list, delete the feature (again, not recommended), and cancel to go back to the work list.

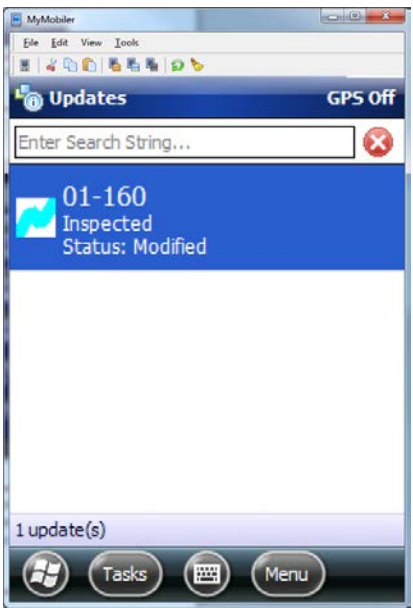


Manage Edits

Manage Edits shows you the sections that you have inspected before you synchronize.



This is the section that I inspected. You can go here to review what you have done if you would like.

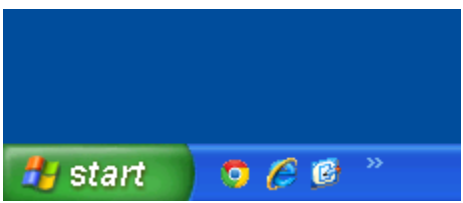


Posting updates

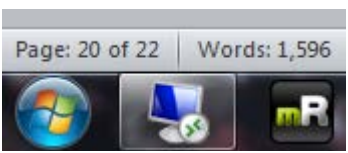
You need to have the device plugged into the computer using the provided USB cable.
Depending on what Operating System you have on your computer will depend on what program you need on your computer.

You can either have the inspectors sync on their computer or have a designated person that syncs all of the devices.

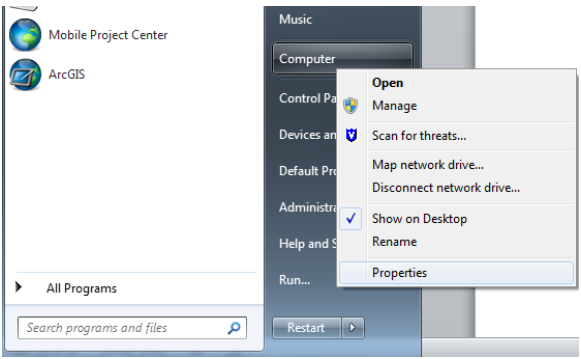
If you have windows XP (you'll have a green start button) you will need Active Sync
http://www.microsoft.com/en-us/download/details.aspx?id=15



If you have windows 7 (you will have a small blue circle with a windows symbol in it) you will need the Windows Mobile Device Center. You need to find if you have a 32 bit system or a 64 bit system.



Right-click on Computer under the start menu and click Properties.



It will tell you under the system part whether you have a 32 bit or 64 bit system.

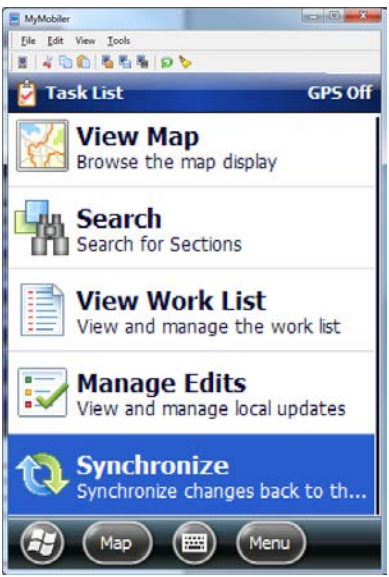
System

Rating:	5.9 Windows Experience Index
Processor:	Intel(R) Xeon(R) CPU W3503 @ 2.40GHz 2.40 GHz
Installed memory (RAM):	6.00 GB
System type:	64-bit Operating System
Pen and Touch:	No Pen or Touch Input is available for this Display

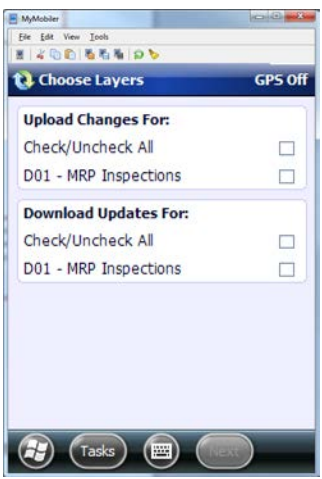
If you have a 32 bit Windows 7 system you will need this program:
http://www.microsoft.com/en-us/download/details.aspx?id=14

If you have a 64 bit Windows 7 system you will need this program:
http://www.microsoft.com/en-us/download/details.aspx?id=3182

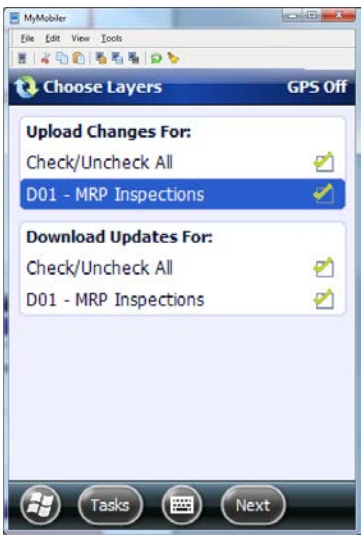
With the device plugged into a computer the Synchronize task is what you will use to push your edits to the main database and pull in any new data.



You can upload and download the data by checking the boxes. You may want to download new data if someone else with another device inspected sections. You will get those updates if you download.



It’s best to go ahead and check both boxes so you push the latest data and get the latest data. Check both boxes and click next. Everything should go through and you should get a succeeded message. If you do not and you get an error please contact the GIS team.



If you have any issues whatsoever do not hestitate to call the GIS team.

Andrew.McKinney@ky.gov – 502-782-3717