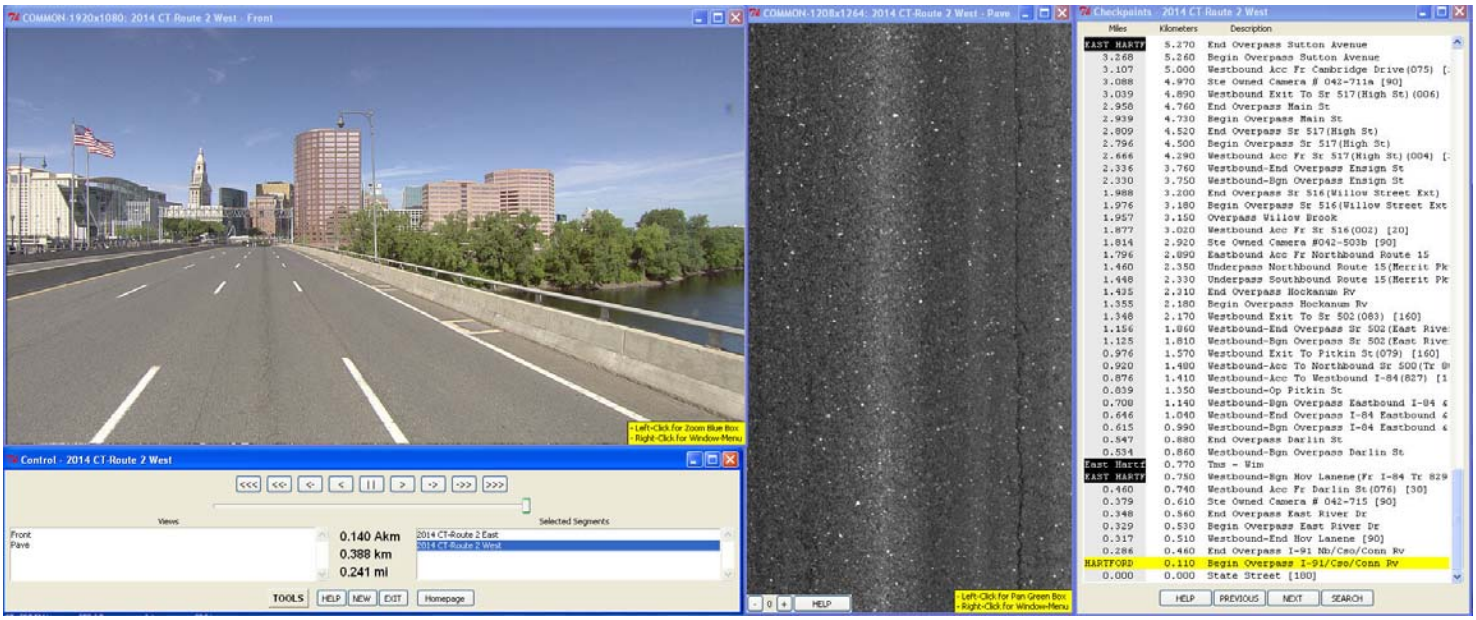
DigitalHIWAY



User's Manual

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Table of Contents

The Startup Screen – DigitalHIWAY Index 4

Beginning a DigitalHIWAY Session 6

Selecting the RAMP Database Option in DigitalHIWAY 7

The DigitalHIWAY Session 8

Control Panel Window 9

- Views Listbox 10
- Segment Selection Overview 11

The Tools Button 12

The DigitalHIWAY Checkpoints Window 15

- How the Window Works: 17

The DigitalHIWAY Image Window 18

- The Pavement View 20
- The Side View 21

Multiple Windows 22

The Image Window Menu 23

Managing Sessions 25

- Show News (currently unavailable) 28

The Wayback Machine 29

- Launch & Landing Windows 30
- Landing Window Navigation 31
- Syncing the Landing Windows 32

The Subset Tool 33

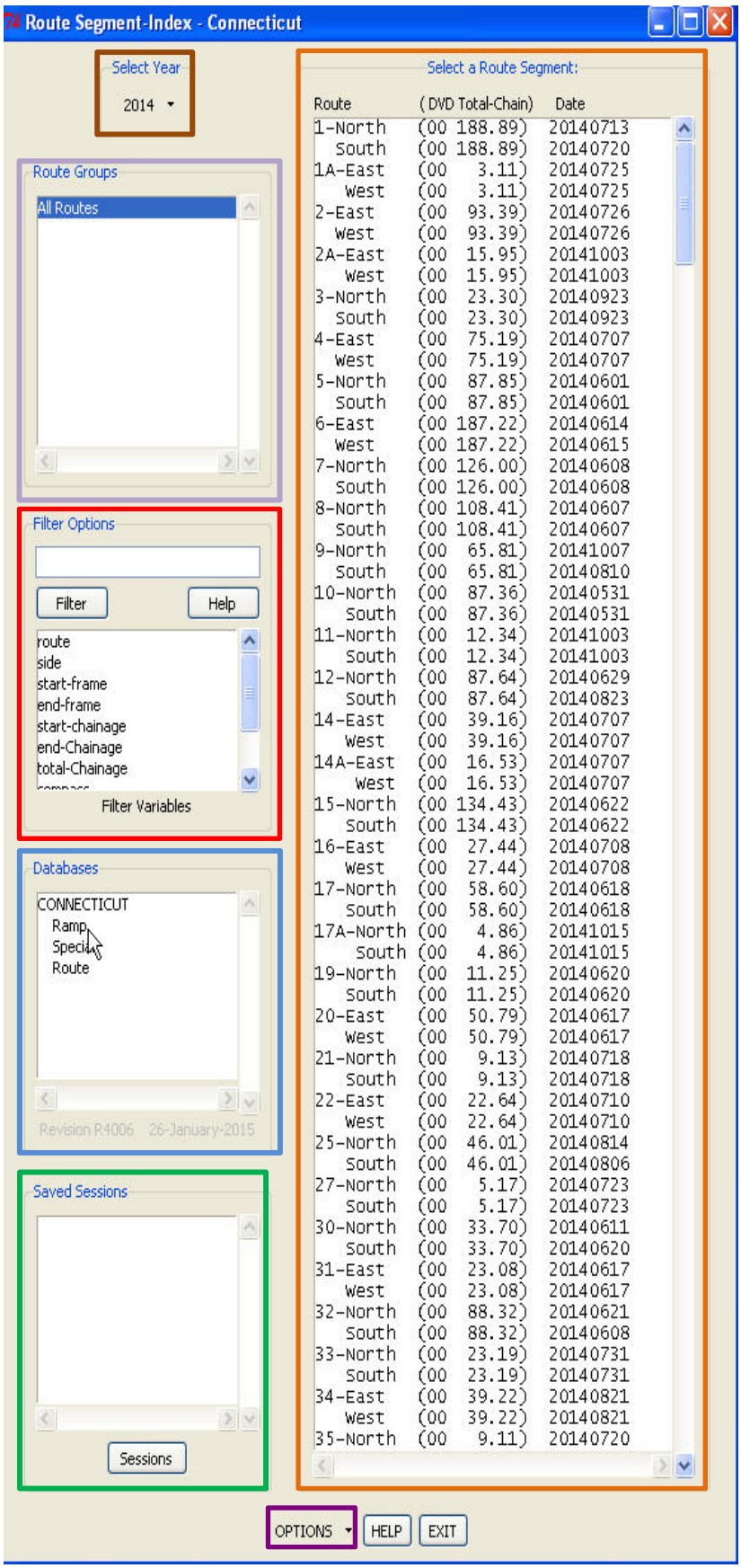
- Creating a CJL File 36
- Creating JPEG-GIS Files 37

The Google Map Feature 38

- The View Buttons 41
- Navigation Tools 42
- How DigitalHIWAY and Google Maps Interact 43
- The Wayback Machine and the Google Map 45

Google Maps Tips and Tricks 45
Geometric Data 46
Types of Geometric Data 47
The Geometric Datastreams Window 48
Breakdown of the Geometric Data window 49
The Geo Data Stream Option 51
Unedited Data Streams 52
Custom Record Layout 53
Formatting and Exporting Your Data 55
Linking to the DigitalHIWAY Image Source(s) 57

The Startup Screen – DigitalHIWAY Index



See the next page for explanations of each of the outlined areas above.

The DigitalHIWAY Index consists of the following main subgroups, outlined in the image above and explained below by corresponding colors:

Select Year

Choose the filming year for the route images you wish to view by clicking on the **Select Year** drop down menu. Once selected, all index information is updated for that year. Years available for network viewing are 1985 through the most current year. The default year is that of the most recent set of images. DVD years are 1999 through the 2006. Contact Photolog Services for information on obtaining discs.

Groups – Preceded by "Route," Ramp," or "Special"

The list of available routes can be reduced to a special subset of routes (currently only available for the **Ramp database**). For example, if you are viewing the Ramp Database, you can choose to view only the on-ramps.

Filter Options

The Filter Options box is a tool for narrowing down the list of available routes to contain only routes that meet a particular criterion (for instance, only routes with a total chainage greater than fifty kilometers). This is accomplished by writing a logical Boolean statement in the space at the top of the Filter Options box and then pressing the **Filter button**. For a complete explanation of how to use the Filter Options box and write Boolean statements, click the **Help button** to the right of the **Filter button**.

Database Choices

Choose between databases containing Ramps, Special runs, or all of Connecticut's state-maintained routes. Clicking on the word "Connecticut" (default at startup) brings up the Routes database.

Saved Sessions

This window allows you to retrieve previously saved sessions. Simply click on a saved session in the listbox to retrieve the session or click the **Sessions button** to open the Session Save/Restore window. For more information on Sessions, see **pages 25-28**.

☼**TIP** Sessions let you save all your selected route windows to be restored to your screen the next time you run DigitalHIWAY.

Note: The Session Save/Restore window contains the **Configure button**, which allows you to make changes to the configuration settings and upgrade DigitalHIWAY with the latest version and most recently collected routes.

Select an Available Route

Descriptive information for each indexed route is listed here, including the Route number, distance the van traveled (in kilometers), and the date the imagery and data was collected. Select a route to be viewed by clicking on a direction description in the Available Routes listbox. When you do so, both directions of the route will be automatically opened for you.

Options button

There are two options listed pertaining to the Route Segment-Index window.

Index Window on Top: When checked, the index window will remain on top of other windows on the desktop.
AutoClose after Select: When checked, the Index window disappears immediately after a single selection is made. If unchecked, the Index window remains onscreen to allow more routes to be selected.

Beginning a DigitalHIWAY Session

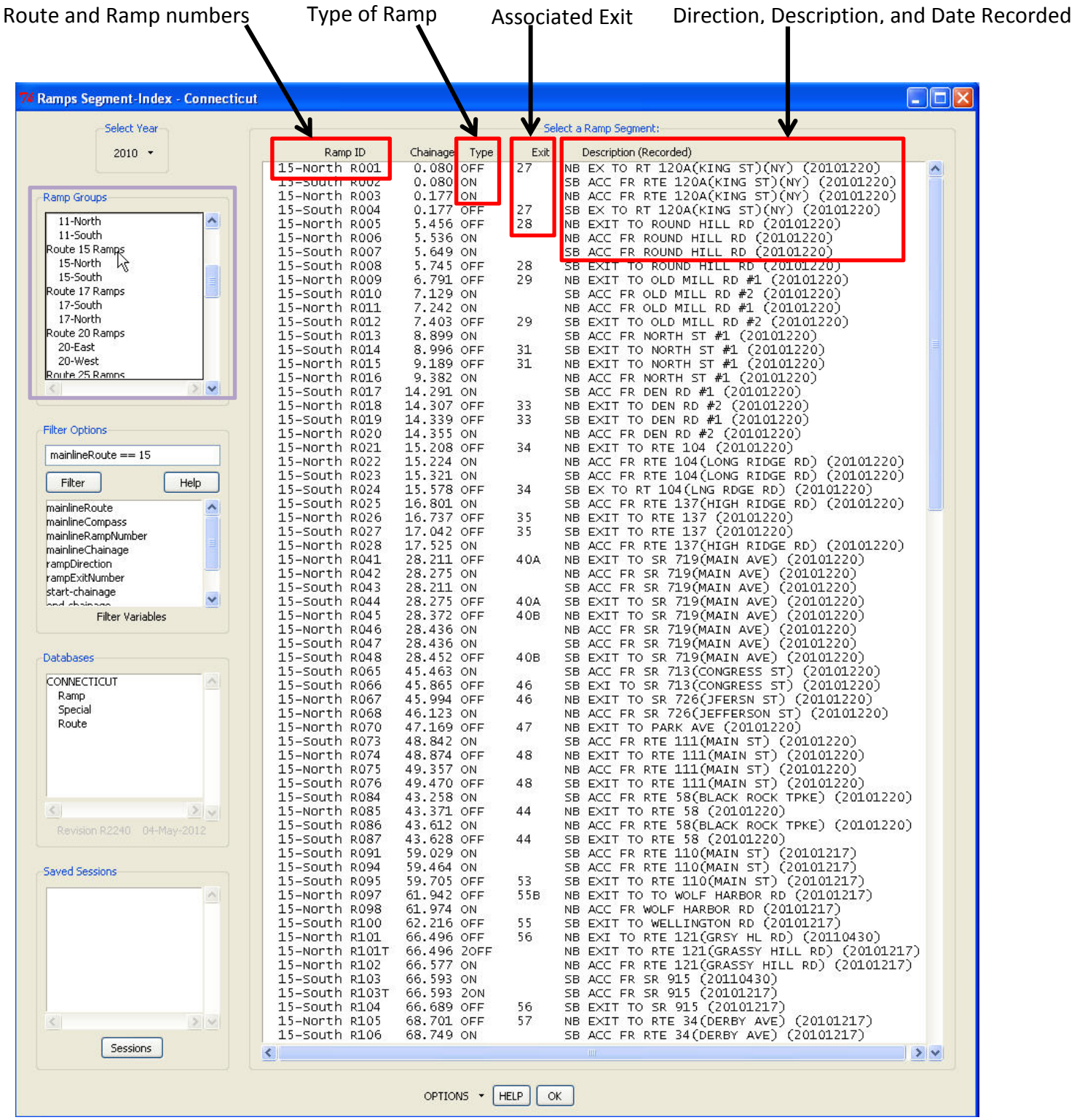
1. To begin a session of DigitalHIWAY, first select the database you would like to choose a route from. The default database upon opening DigitalHIWAY is the **Route** database.
2. Choose the filming year for the route images that you wish to view from the **Select Year** box. The default for this box is to display the most recent filming year available for whichever database you've chosen. If you decide to change databases after changing the filming year, the filming year will revert back to the most recent image year for that particular database.
3. Select a route and direction from the **Select a Route Segment** box.

   Note: North and East directions are generally considered the Log directions and start at the beginning of the route in terms of the route's official chainage (counting up from zero), while the South and West directions are generally considered the Reverse directions and start from the end of the route, counting down to zero.

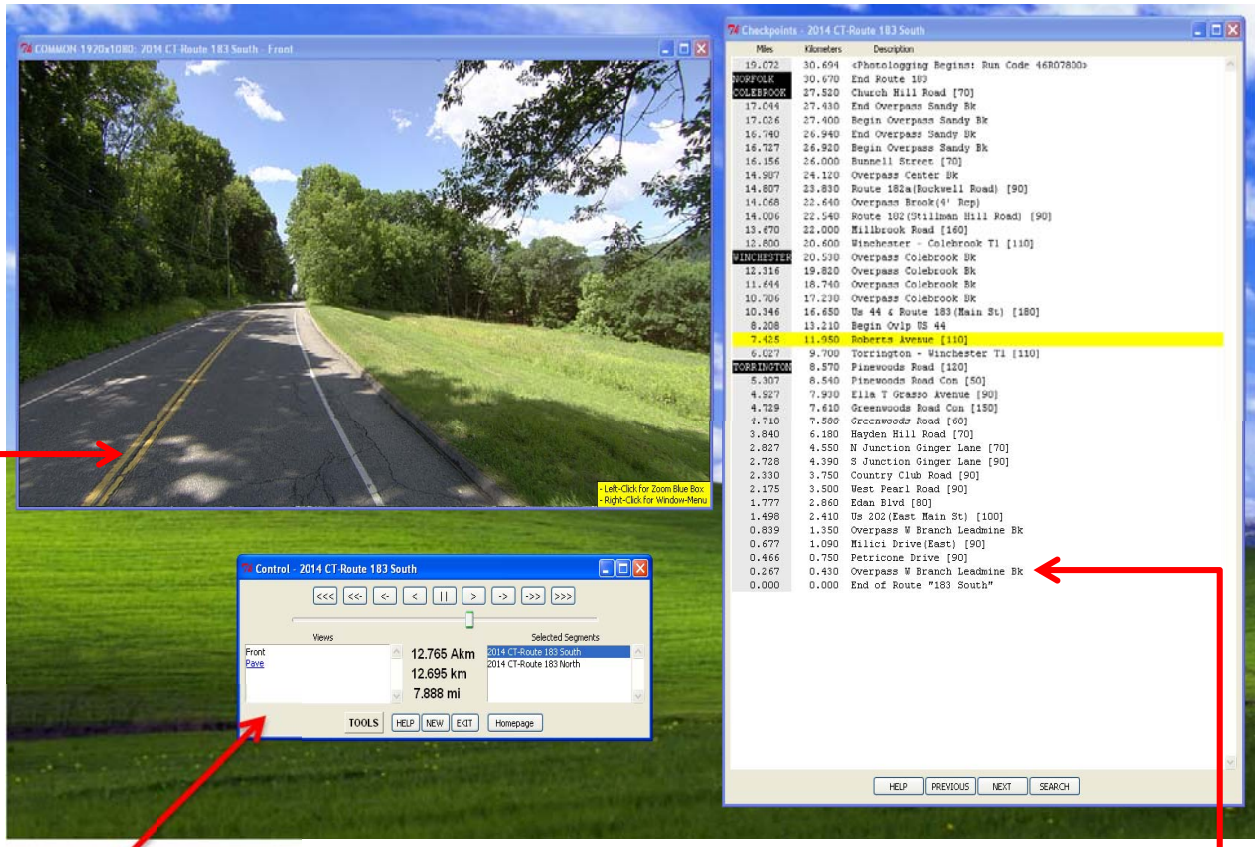
Now that you've chosen a database, the year of filming images, and a route, you are ready to begin a DigitalHIWAY session.

Selecting the Ramp Database Option in DigitalHIWAY

The Ramp database differs slightly from the Route and Special databases. As previously mentioned, the Ramp database has a number of different options in the Ramp Groups box, outlined in **purple** below. After selecting the Ramp database and the year, ramps can be selected according to the route they are associated with by scrolling the "Ramp Groups" window and clicking on one of the available options.



The DigitalHIWAY Session



The DigitalHIWAY session consists of multiple windows displaying:

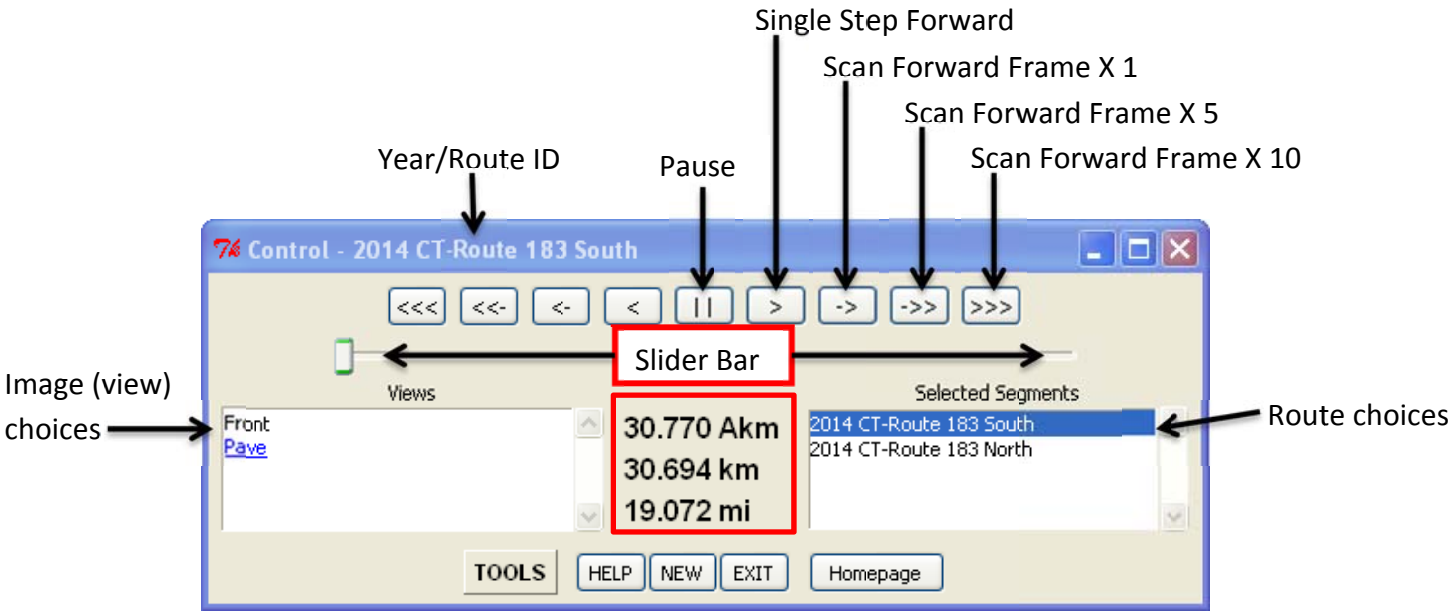
Control Panel

Right of Way (front) images

Checkpoints or Linear referenced roadway features

Control Panel Window

This window allows you to control the position of a selected route/direction that is displayed in the image window. The control window contains sub features including a **Views** selection listbox and the **Selected Segments** listbox. **Click** on a segment description in the **Selected Segments** listbox to make its images and checkpoints appear in their respective windows (or, if multiple front image windows are open, make the selected route "pop-up" to the top of all windows). Once selected in this manner, the route becomes the currently selected route and the images can be scanned using the movement buttons (see below). The route identification for the currently selected route appears in the title bar of the control window. For player control, use the buttons at the top of the screen to control the image display in the style of an audio CD player. See figure below.



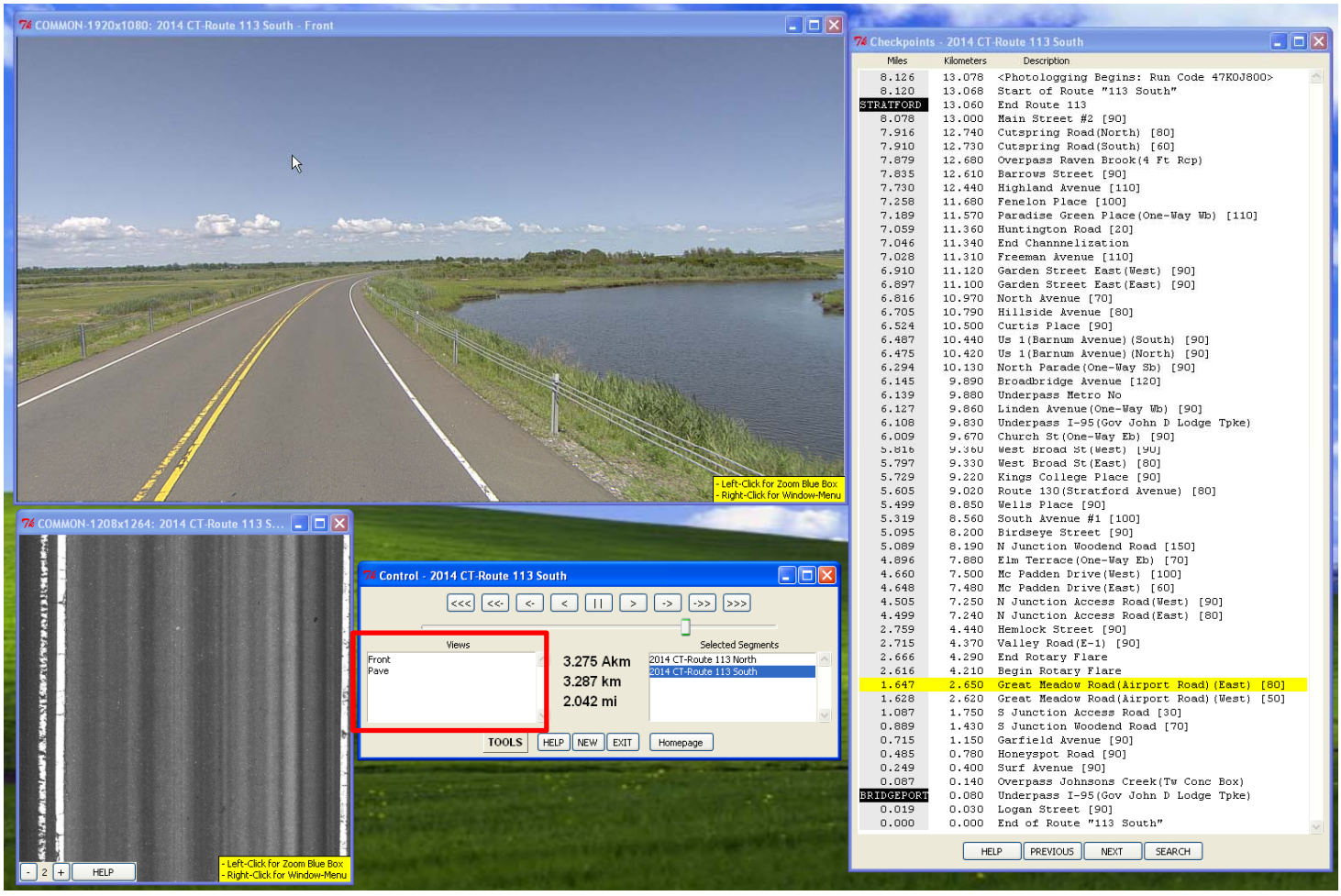
When the player is set to automatic motion in either direction, the updated chainage is shown immediately (lower red box).

When the player is stopped, the chainage for the displayed image is refreshed. The ***Akm*** is the van's chainage from the start of the route. The ***km*** and ***mi*** distance is the official chainage per the HIGHWAY LOG manual from the office of Roadway Information Systems.
You may quickly position the player to any portion of the selected segment by sliding the **slider bar**, which is located immediately below the CD-style player buttons. A route's zero chainage is always on the left in the Log direction and on the right when viewing its Reverse direction.

You can incrementally step the slider bar by clicking in its trough either to the left or right of the slider. By placing the cursor anywhere within the Control window (only when it is the active window) and rolling the mouse wheel, the images are scanned forward or backward one frame at a time according to the mouse wheel movement.

Views Listbox

The **Views** listbox (outline in red) displays the available views for the currently selected segment. When viewing a route that includes side or pavement (Pave) images, clicking on a listed view when it is underlined and in a blue font will cause a new window to open displaying that particular view. To remove a window from view and free up more space on your desktop, click again on that particular view from the Views listbox.



The **Selected Segments** listbox shows the routes selected from the Index. Routes shown in black text and white background represent routes open in common windows. Routes shown in blue text with grey background represent routes open in separate windows.

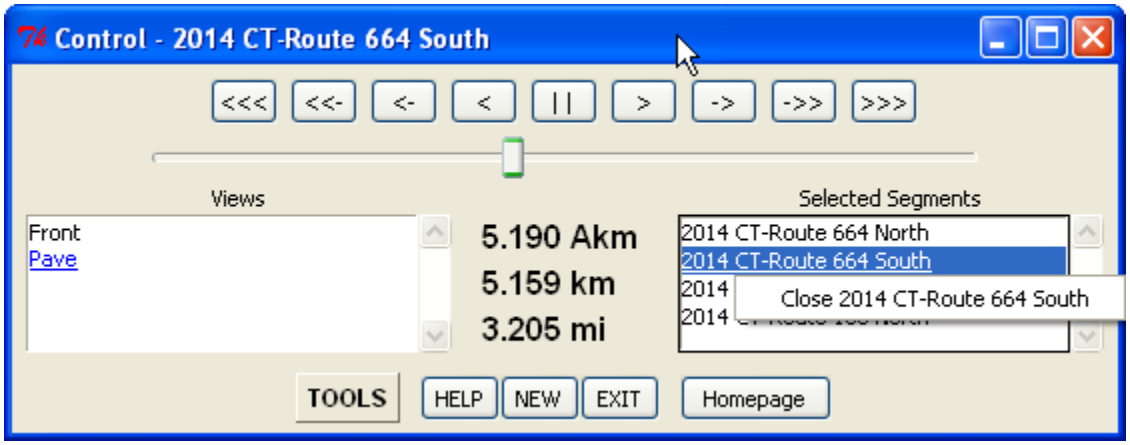
You pick which segment you wish to view by clicking on the desired segment line in the **Selected Segments** listbox. When clicked, the window containing that route's front images will move on top of the other image windows.

Segment Selection Overview

When you select a Segment from the Route Index window, it is transferred to this **Selected Segments** listbox. An associated segment (usually the segment that shows the other direction for the same route) is also transferred to this listbox. A Segment and its associated Segment are considered to be linked in that they share a chainage position. In other words, if you move to any location within a segment for one direction, when you switch to the associated linked segment, the view shown will be for the same location in the opposite direction. You may add segments to the Selected Segments (provided they are available either by network or disk side) by going back to the Index window. Use the **New button** to bring up the Index window again.

You may scroll the Selected Segments listbox using the scroll bar on the right, or you may stretch the entire Control Window in the vertical direction to enlarge the list box (the best approach to enlarging the window is to "grab" the bottom edge using the mouse and drag it down).

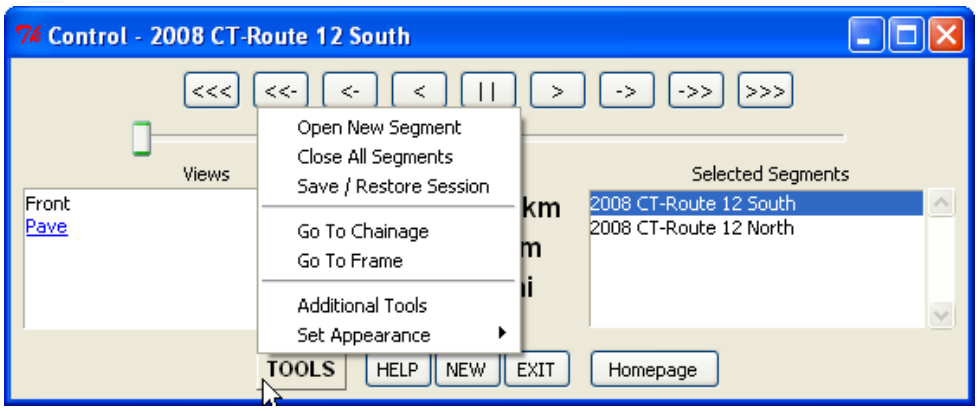
You can close a segment within the Selected Segments listbox by **right-clicking** on the segment and choosing **Close [segment name]**.



Click the **Homepage button** to open a web browser directing you to the CT-DOT's Photolog Homepage.

The Tools Button

Click on this button and move the cursor vertically to make one of the following selections:

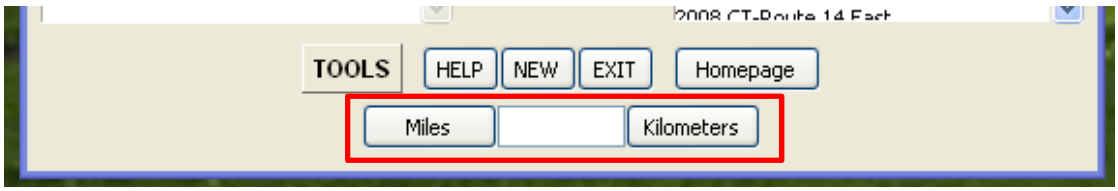


Open New Segment
Click to open the Route Segment-Index Window to choose a new route which can be opened in a new front images window or in the existing one.

Close All Segments
Closes all route segments currently open and opens the Route Segment-Index Window. A warning message will appear asking if you are sure you want to close all segments.

Save/Restore Session
Opens the Session Save/Restore window which lets you save the current DigitalHIWAY session or open an existing session. For detailed information on sessions, see **pages 25-28**.

Go to Chainage
Clicking this option expands the Control Panel by adding a dialog box that allows you to move the displayed position of the current route directly to a specified chainage (either in miles or kilometers).

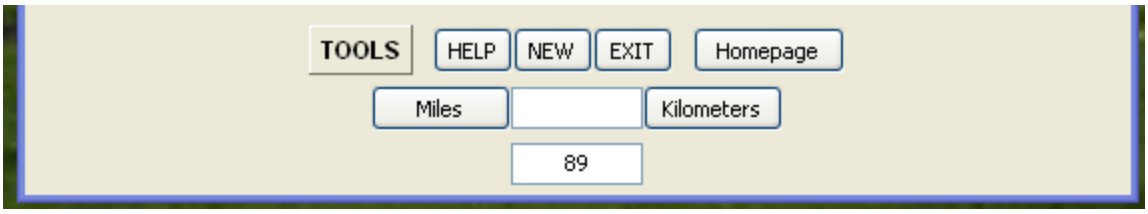


You may enter a new number and **click** "Miles" or "Kilometers" to select the interpretation of the chainage number. The closest chainage within the route is displayed.

Go To Frame

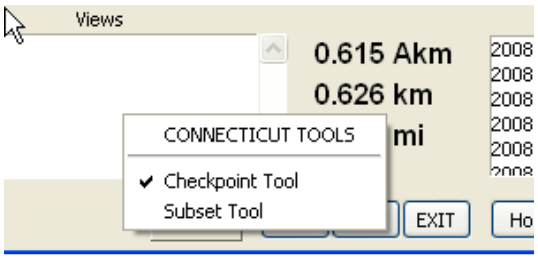
This tool displays the frame number for the currently displayed front image and also allows you to jump to any frame along the route by typing the frame number into the box and pushing the **Enter** button on your keyboard.

Note: When advancing forward through the front images, the frame number will always count up, even if the chainage is counting down.



Additional Tools

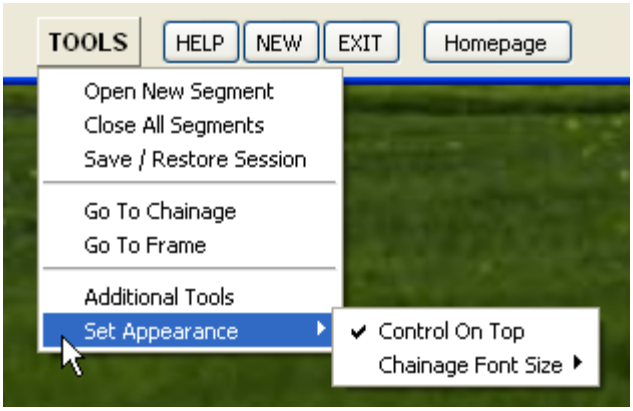
Choose this option to pop-up a dialog box from which you can choose whether or not to display the Checkpoints window (each time you open DigitalHIWAY this option will be turned on by default), as well as the option to open the **Subset Tool** window. For more information on this tool, see **pages 33-37**.



Note: "Connecticut Tools" is simply a header and not an option for additional tools.

Set Appearance

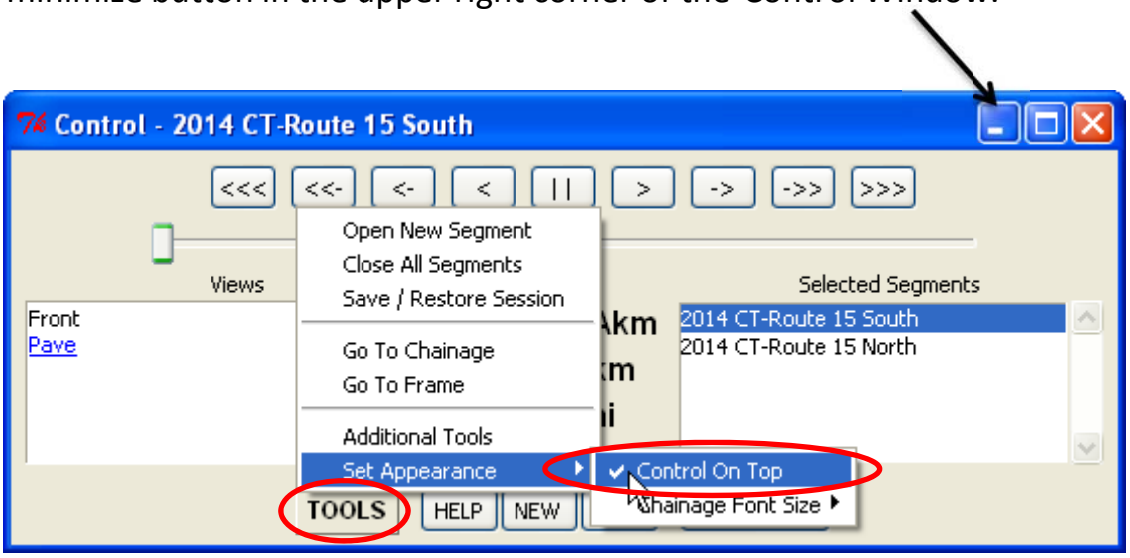
Placing your mouse cursor over this tool will open a cascading menu allowing you to change the font size of the Chainage numbers in the control panel, as well as the option to turn the **Control On Top** feature on or off.



Control on Top

Check this option, found in the tools menu, to keep the DigitalHIWAY Control window on top of all other applications running on the desktop.

TIP: To quickly make room on your desktop by minimizing all of DigitalHIWAY windows, click on the minimize button in the upper right corner of the Control Window.



The DigitalHIWAY Checkpoints Window

Currently selected checkpoint

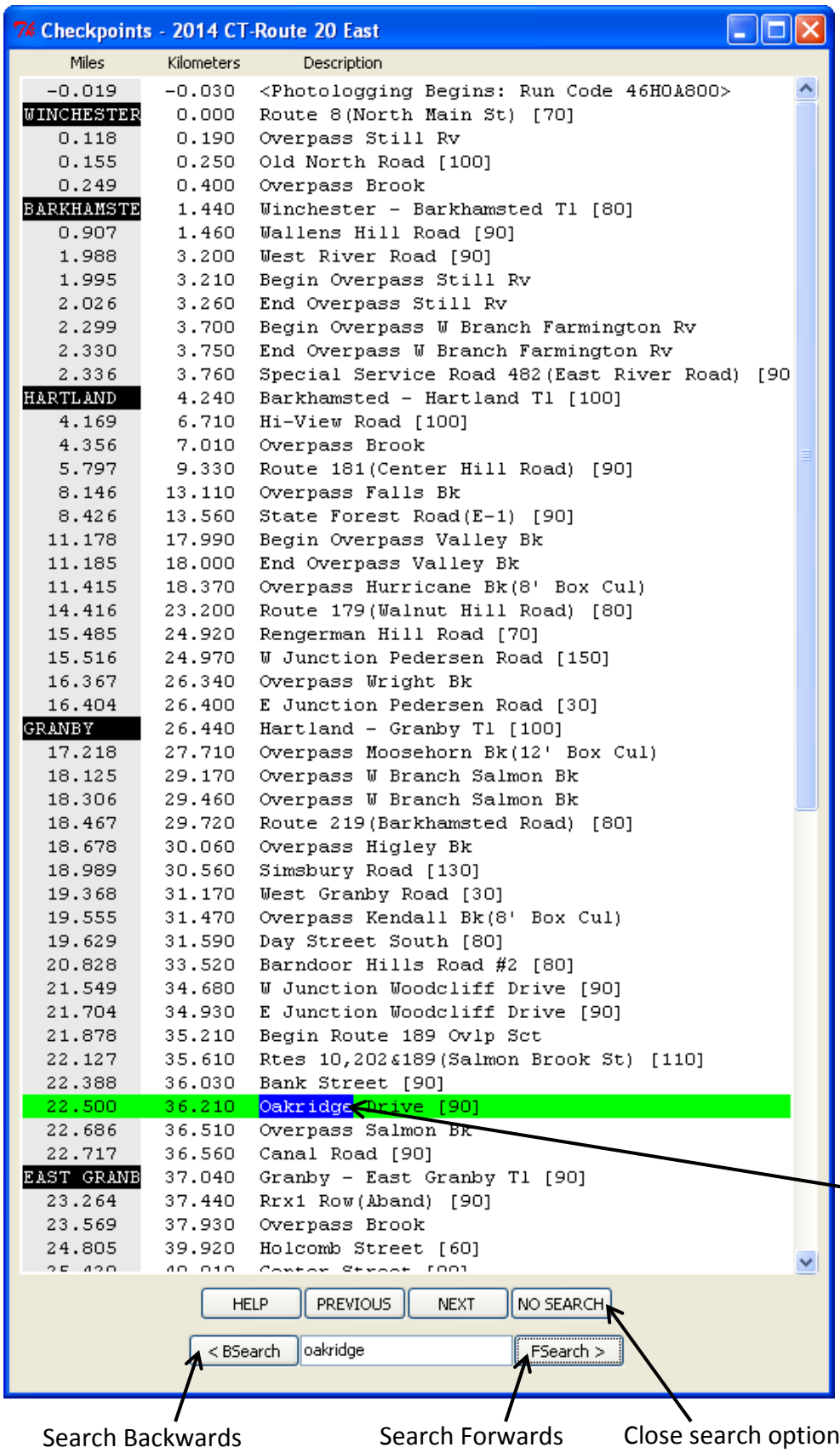
HELP provides help in the use of the Checkpoints Window.

SEARCH allows you to type in a search Word or exact-matching Phrase within the Checkpoints Window. Type the word or phrase you'd like to match and then select forward or backward from your current position. A successful match is highlighted in **BLUE**.

PREVIOUS displays the image that corresponds to the previous checkpoint from the currently selected front image.

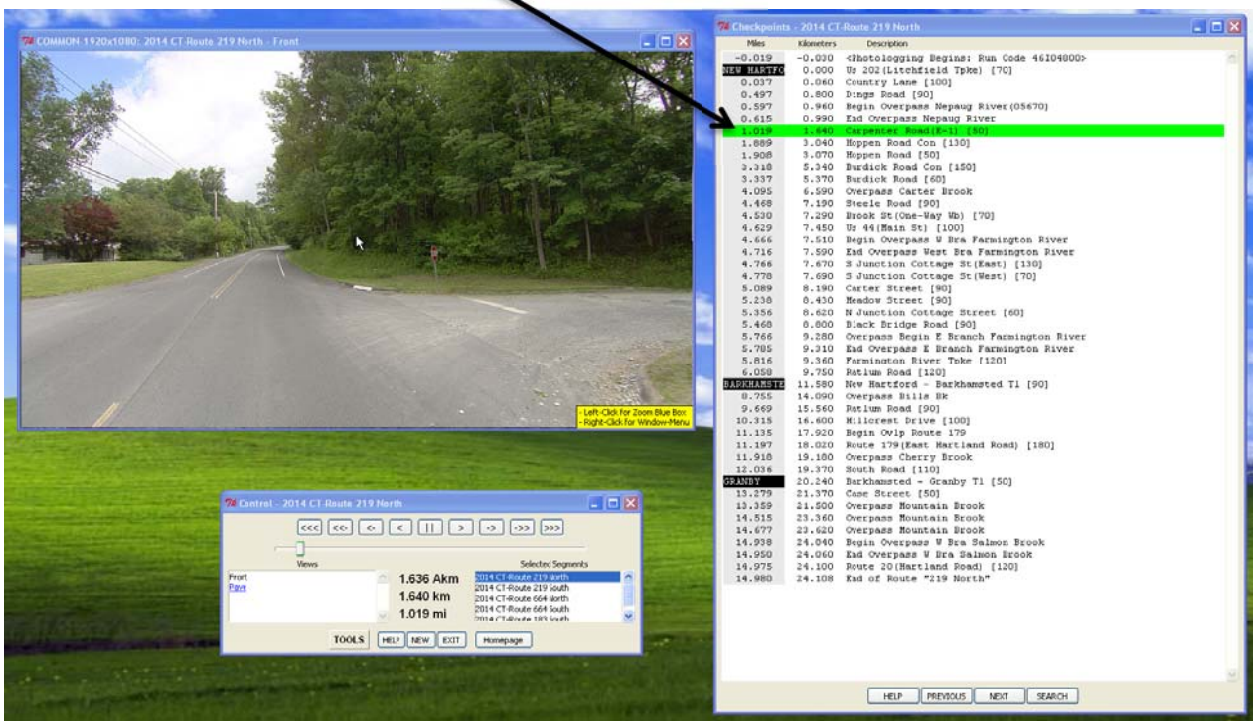
NEXT displays the image that corresponds to the next checkpoint from the currently selected front image.

Checkpoint Window with Search Tool in use

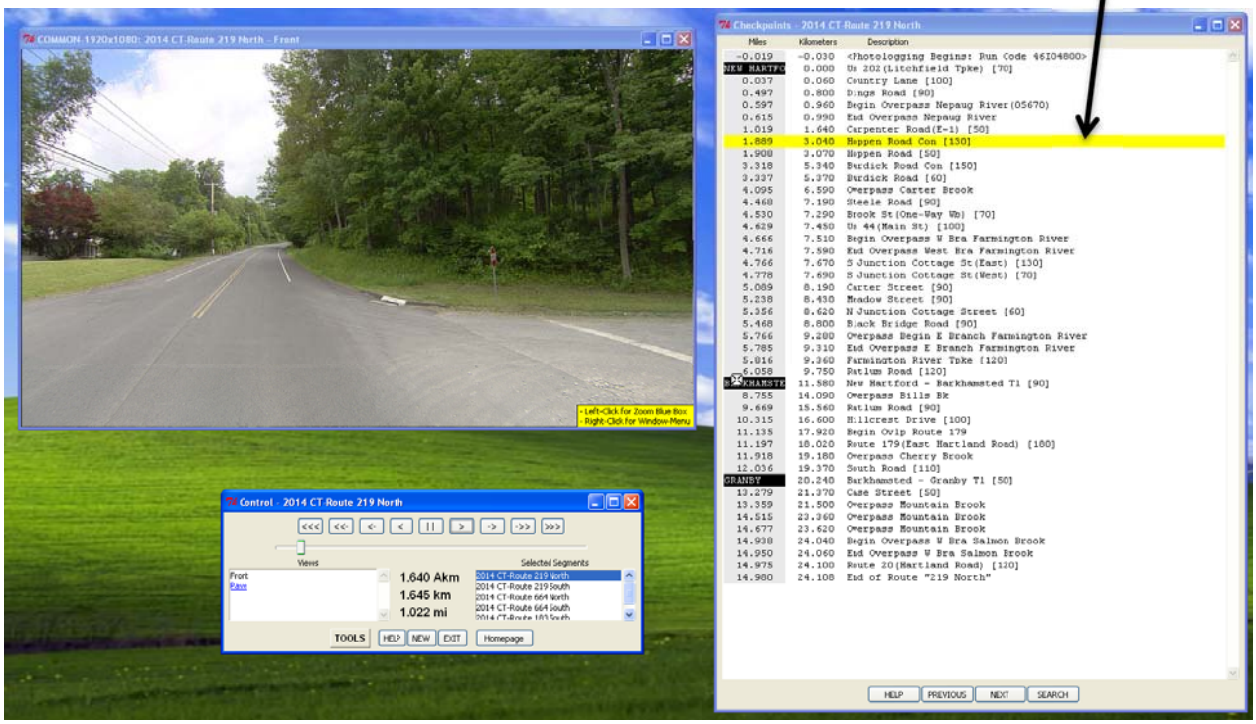


How the Window Works:

When a checkpoint is highlighted in GREEN, the roadway image being shown corresponds to the checkpoint.

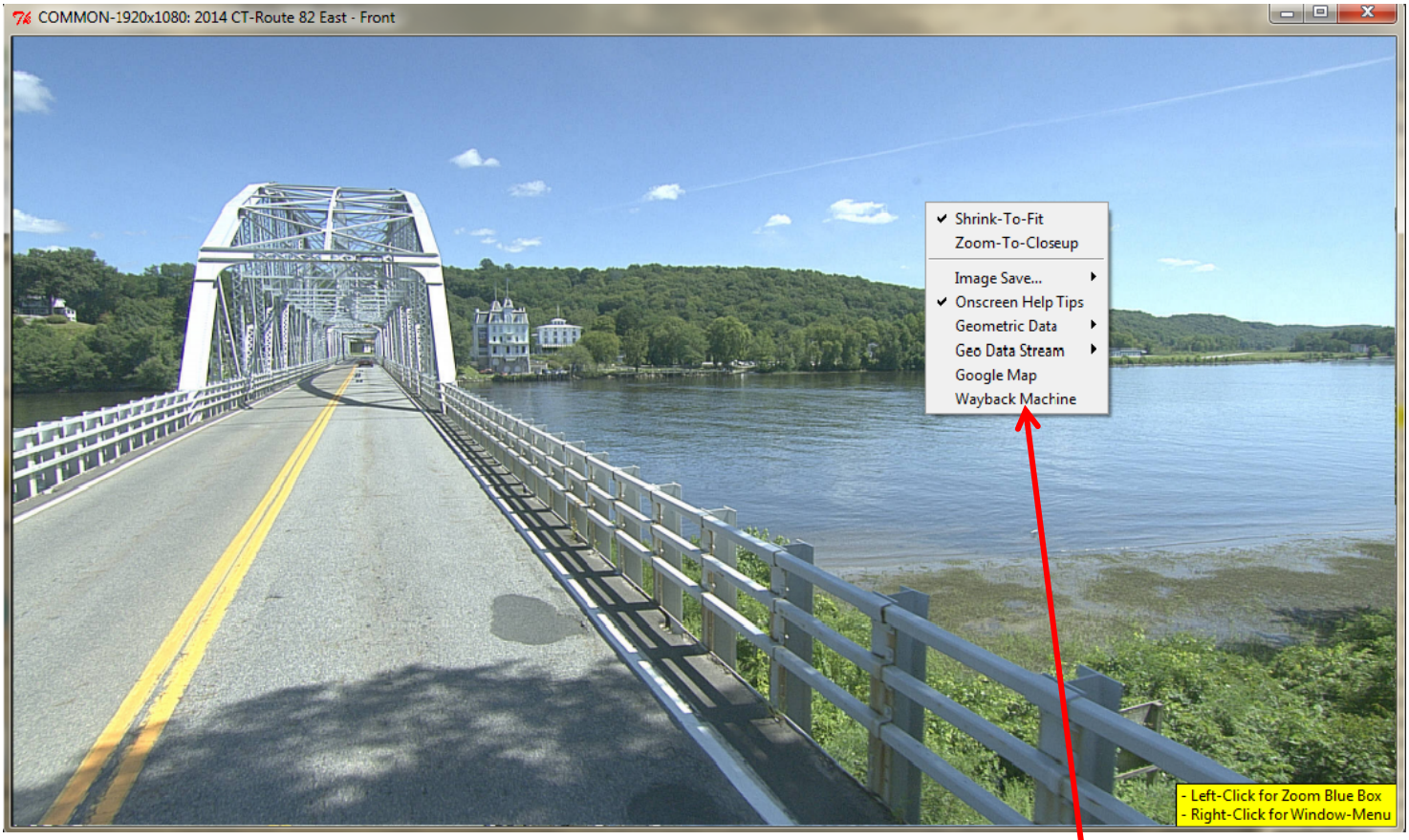


When a checkpoint is highlighted in YELLOW, the image being shown PRECEDES the highlighted checkpoint. The checkpoint turns GREEN when the checkpoint is reached.



You may **click** on any checkpoint line to move directly to that checkpoint.

The DigitalHIWAY Image Window



Right-clicking anywhere within the front images window will bring up a menu of additional tools and options, described on **pages 23-24**. This menu can also be accessed by right-clicking the pavement image window as well as any Landing Year window when using the Wayback Machine tool. For more information on the Wayback Machine, see **pages 29-32****.**

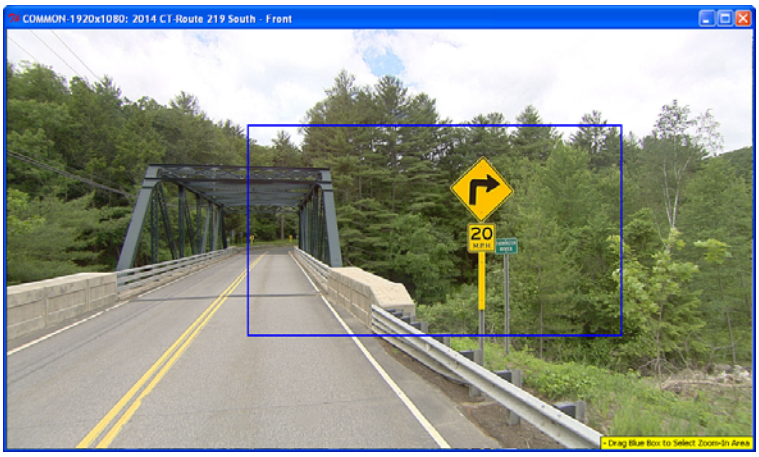
Stretch

To stretch a large image, click on any side or corner and drag. The image will automatically adjust to maintain the correct image aspect ratio.

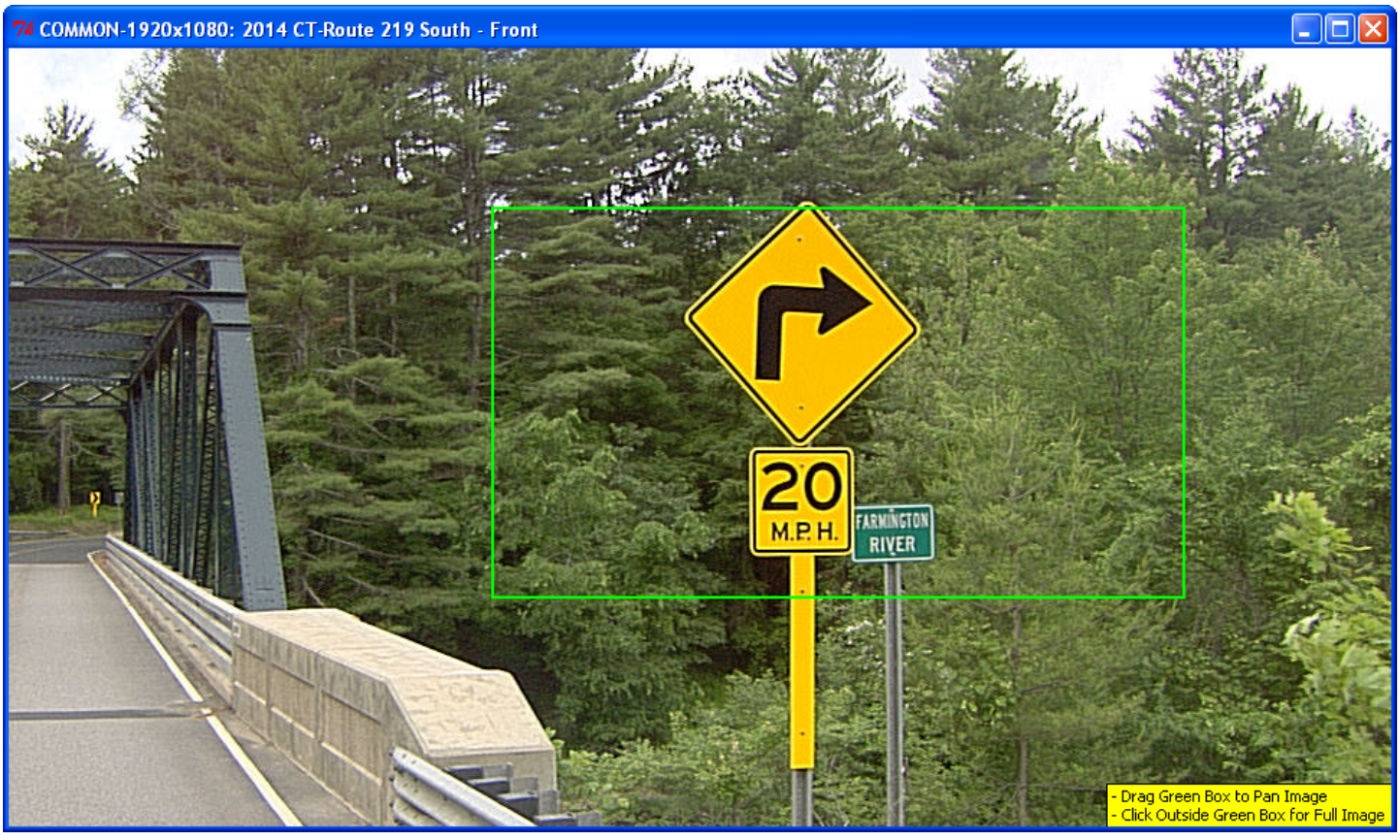
Tip: Look at the title bar on top of the image to see if the image is large or standard. The title of a large image will be preceded by "1920x1080." A standard image title is preceded by "640x480."

Unlike previous versions of DigitalHIWAY, the image window offers some interactive features, which are accessed by left and right clicking with your mouse on the image. As mentioned above, **right-clicking** the image window opens a menu of options (pages 23-24). **Left-click** options include:

Zoom: To zoom in on an area within the Image Window, **left-click** anywhere on the window. A blue box will appear in the upper left corner which can then be moved to the area of interest. The image will zoom in to the selected area as soon as you unclick the mouse.

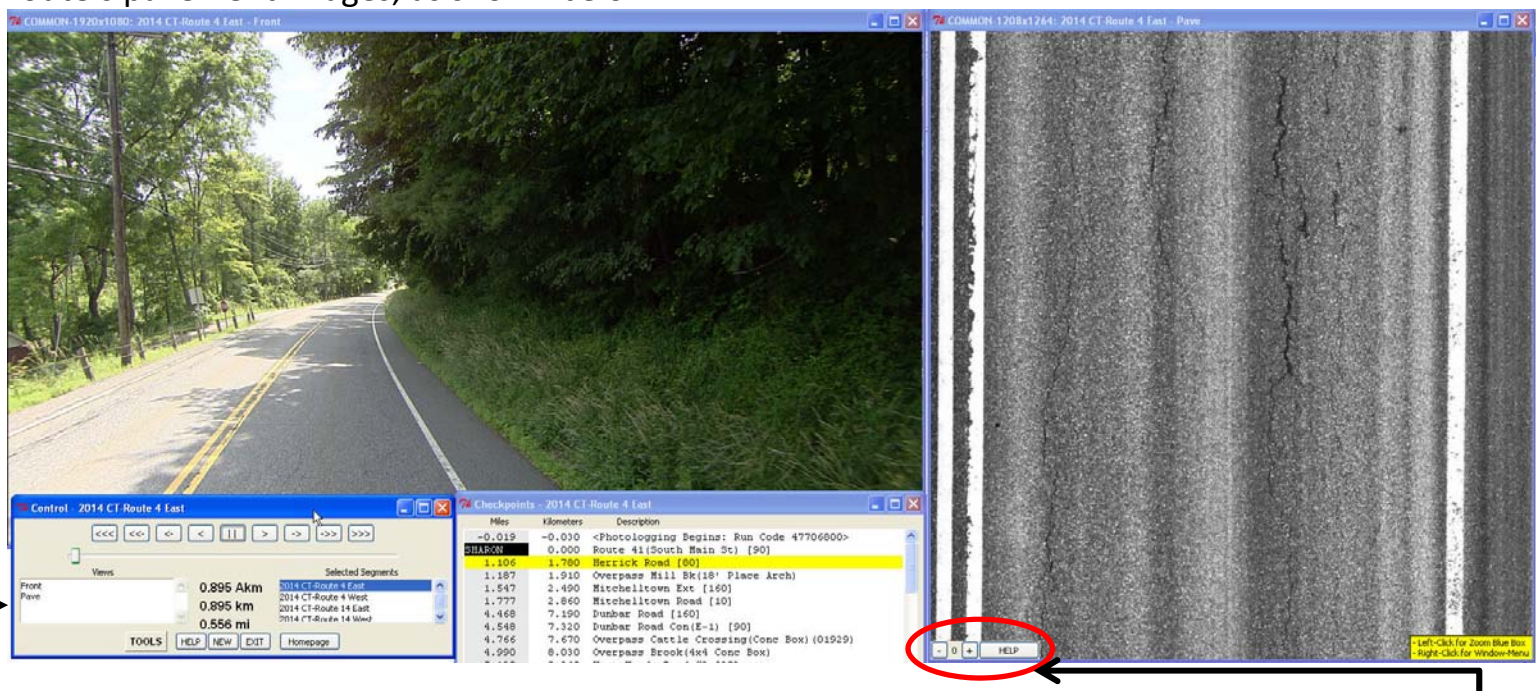


Pan: To pan within the zoom image, left-click to bring up the green pan box. Click within the box and **drag** to pan (See image below).



The Pavement View

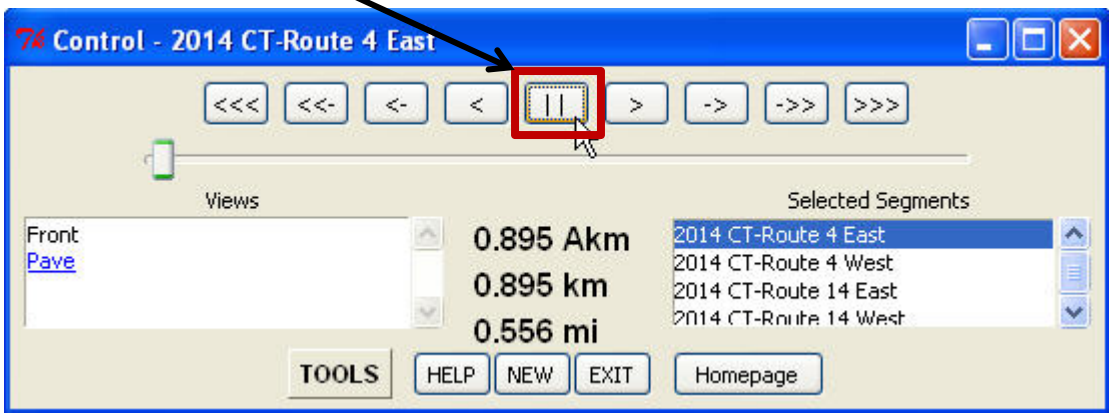
By clicking on the **Pave** link on the Control Panel, you will open a new window displaying the route's pavement images, as shown below.



A **right-click** of the mouse in this window will bring up the same menu of options that appears from right-clicking the front image window, but with an additional option for an **Offset Menu**, seen circled above.

When the pavement picture appears, the actual location of the pavement in the picture is two frames behind from the front, forward facing picture. The **Offset Menu**

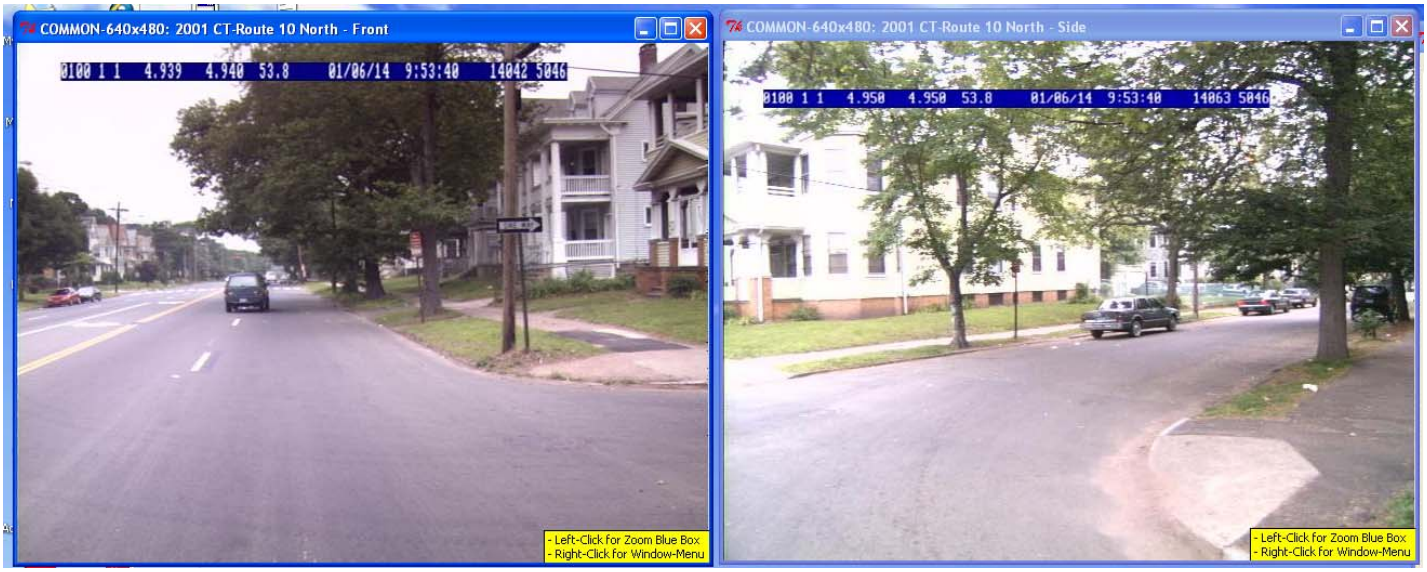
located at the bottom of the **Pave** window will allow you to advance the pavement image forwards or backwards any number of frames. Usually, setting the number to **+2** will allow you to view the pavement picture corresponding to the displayed forward facing picture. If you advance the **front** image using the continuous forward or backward scanning buttons, the pavement picture will automatically update once the route has been stopped by using the control key as seen below.



The Side View

For the image collections years between 1999 and 2005, a **Side view** image window will open alongside the front image window for each route selected. These images are taken from a camera aimed not quite perpendicular to the right of the direction the van is headed. This camera angle provides images of roadside objects that might otherwise be obstructed from view on the front facing camera.

When available, the option for the Side View images will appear in the **Views box** on the Control Panel, but unlike the pavement images, the side view images will open by default when a route is opened and appear side by side with the front images window, as seen below.



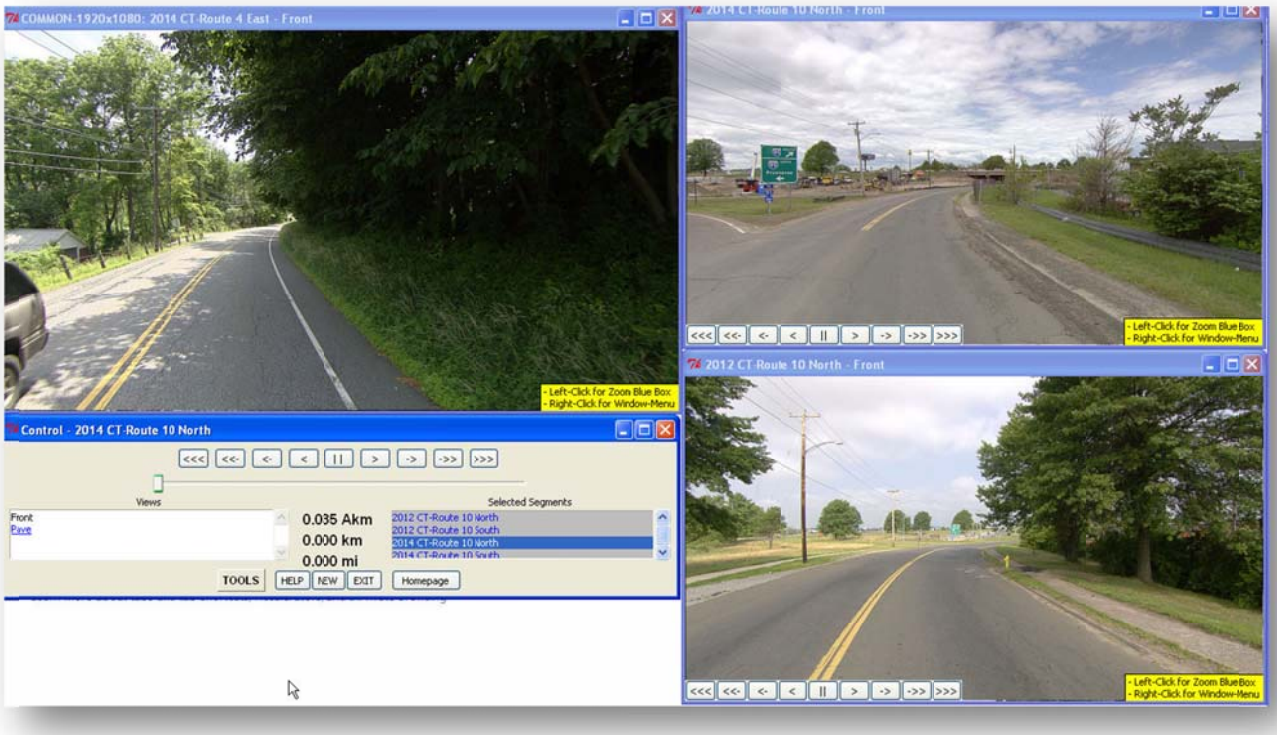
Multiple Windows

Anytime you have a route open and wish to open an additional route, you will have to click to specify whether to "**Open in Existing Window**" or "**Open in New Window**" for the selected route.

Existing - All routes selected into the **Existing Windows** *share* those windows. Only one of the selected routes can appear at a time in a Common Window. A new route selected for viewing in a common window replaces the image being shown currently.
Advantage: Fewer windows to manage on-screen.
Disadvantage: Cannot view more than one route's images at a time.

New - A Route selected into **New Windows** cause *new separate windows* to be created especially for the images of that route. No other route will share these separate windows.
Advantage: The route's images remain available even when other route's images are selected and shown in the Common Windows or other Separate Windows. Visual comparisons are easy.
Disadvantage: More on-screen windows to manage. Use the **Sessions** feature (see section on Sessions on **pages 25-28**) to help manage large numbers of Separate windows.

Multiple Windows Screenshot



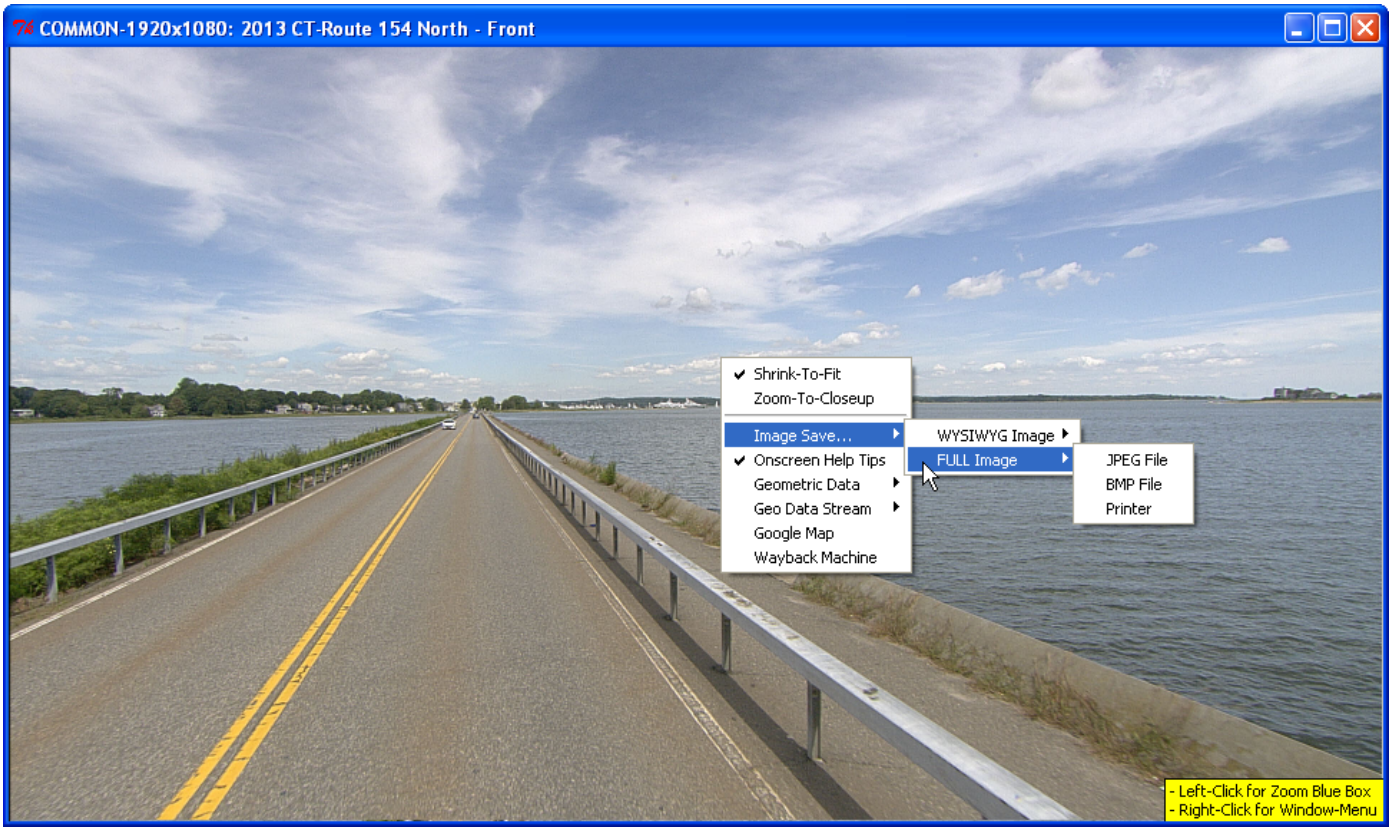
The Image Window Menu

Zoom To Closeup
Choosing this option has the same effect as **left-clicking** the image and then clicking the blue zoom box that appears.

Shrink To Fit
When zoomed in on the image, choosing this option returns the window to the full image view.

Image Save
This menu is also the location from which images can be printed and saved to jpeg and bitmap file formats for later use in off-the-shelf PC applications such as word processors and graphics packages. Choose the **Image Save** selection to accomplish this (See image below).

TIP: The yellow onscreen help tips within the image windows can be turned off by deselecting **Onscreen Help Tips** within this menu.



Note: "WYSIWYG" stands for "What you see is what you get." In other words, if you are zoomed in so that only a portion of the image is on screen, selecting this option for saving or printing will only capture the portion that you see. Choosing this option also saves the image at the size the window is currently set to. For smaller image files, simply make the image window smaller.

Geometric Data
Pointing the cursor over this option brings up a sub-menu with the options to view and configure the **Geometric Data** for the selected route or to view the **Help** file about the Geometric Data. For a complete explanation of this feature, please see the section on Geometric data beginning on **page 46**.

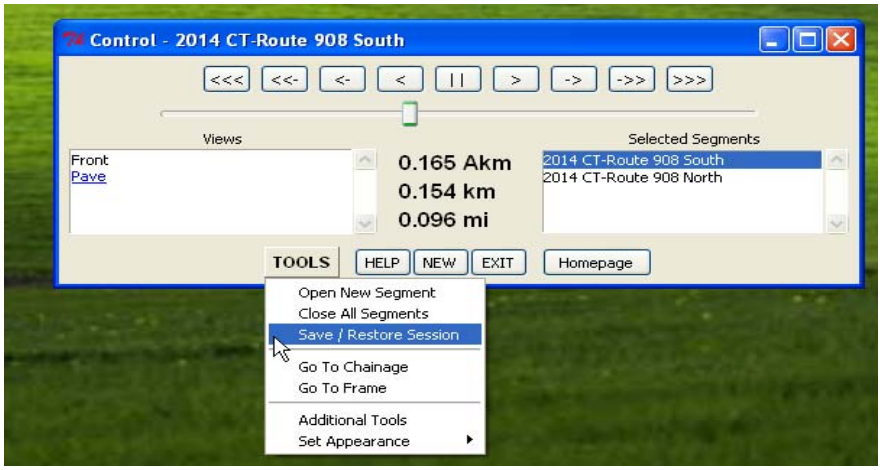
Geometric Data Stream
Pointing the cursor over this option will bring up a sub-menu listing the various kinds of geometric data collected by the van. Clicking any of these Data Streams will open up the "Geometric Datastreams" window in which the geometric data for the chosen category will be automatically displayed. For a complete explanation of geometric data streams, please see **page 47**.

Google Map
Choosing this option will open a Google Map in an Internet Explorer window displaying the route, with balloon marker indicating the point along the route that corresponds to the location of the front image currently being viewed.
For more information on the Google Map feature, see the section beginning on **page 38**.

Wayback Machine
Clicking on this option will open the Wayback Machine Tool Landing Times window. With this tool you will be able to simultaneously view front images for multiple collection years of the same route. For more information on this tool, please see the section beginning on **page 29**.

Managing Sessions

To save a current DigitalHIWAY Session, click on the **Save/Restore Session** selection within the Control Window's Tools menu.



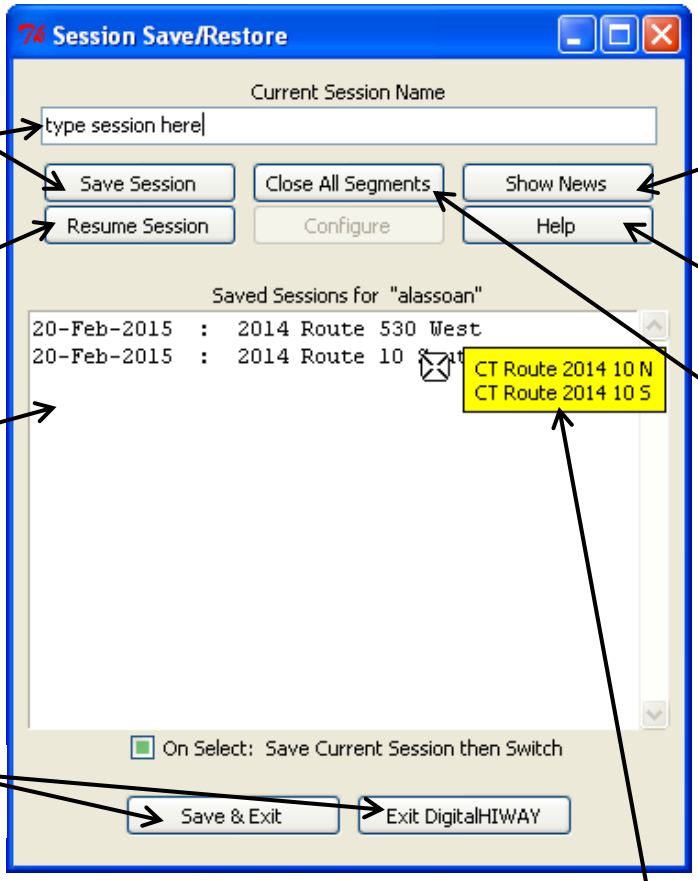
The Session Save/Restore Window appears on your desktop. You may then:

Name and save the session you've been working in (a name must be typed prior to saving)

Resume the current session (closes the Session Save/Restore window)

Saved Sessions box (saved sessions will be listed here)

Save and/or Exit DigitalHIWAY



Show and configure news about DigitalHIWAY

View Help on the Window

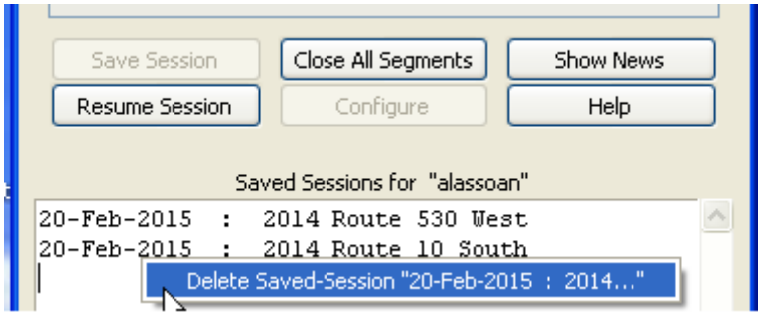
Close all segments currently loaded

Tip: Hold your cursor over a saved session to see a detailed content list for that session.

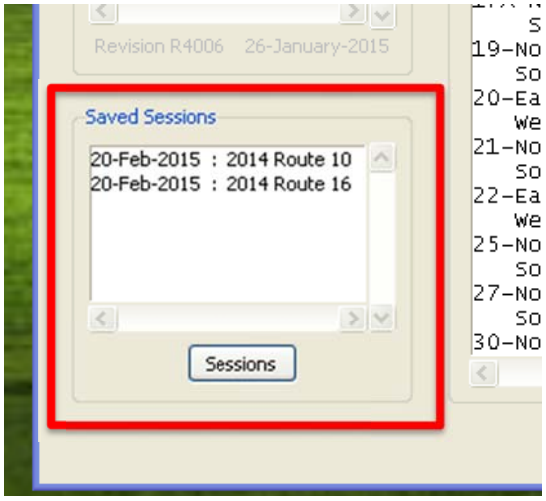
Managing Sessions (continued)

After you've named and saved a session, that session will be listed in the **Saved Sessions** box, listed in order from newest to oldest. Immediately after saving, the **Save Session** and **Save & Exit buttons** will become unavailable. These will remain this way until you close and reopen the Session Save/Restore window, even if you've opened a new route or changed the front images. Clicking on any of the sessions you've saved, including the one you are currently in, will simultaneously open the selected session and close the Session Save/Restore window.

☼ **Tip:** Right-click a session from the Session Save/Restore window for the option to delete the session.



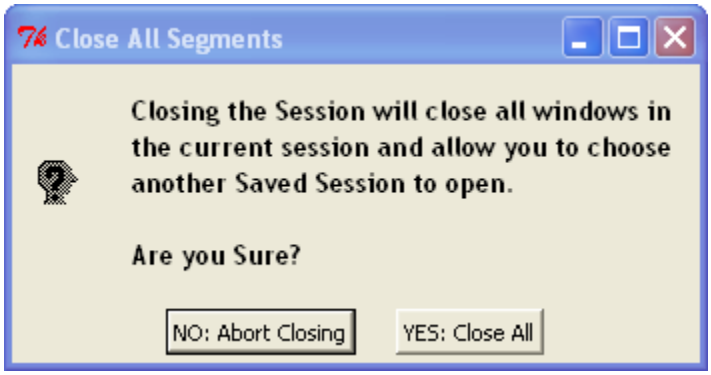
Saved sessions will also be listed in the Saved Sessions box on DigitalHIWAY's launch or Route Segment Index window, as seen below.



Note: You may only open a saved session from this window if no other route segments are currently open for viewing.

Closing All Segments

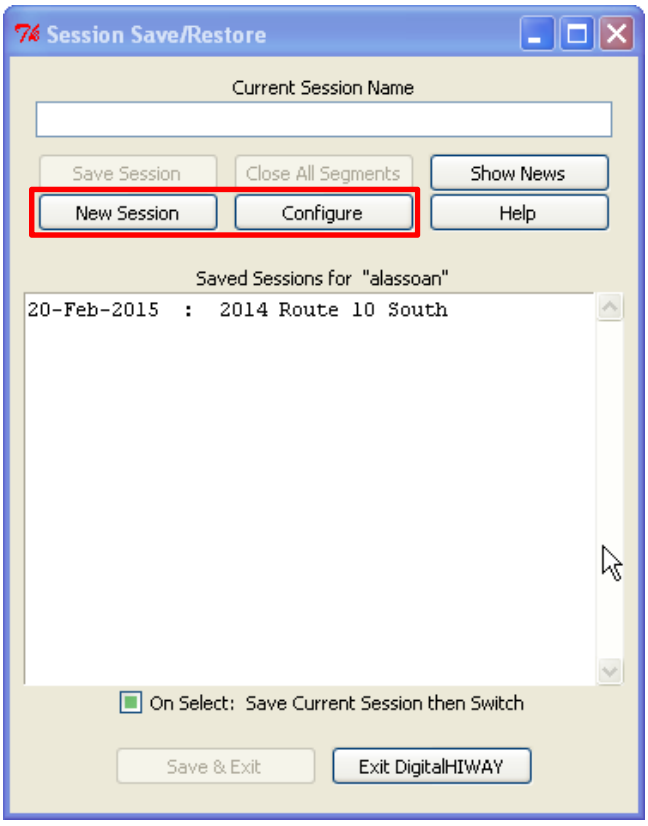
Upon clicking the **Close All Segments button**, a warning message will appear on screen, as seen below.



Clicking "YES: Close All" will close all windows in the current session and open up a couple more options in the Session Save/Restore window.

Note: Closing all of the sessions individually through the control panel or by closing out all of the front images windows will not open these options in the Sessions Save/Restore window. You will still have to click the **Close All Segments button** even with no segments open.

After closing all segments, the Session Save/Restore window will appear as seen below, now with the **Resume Session button** replaced by a **New Session button** and with the **Configure button** now able to be clicked.



Clicking the **New Session button** will close the Session Save/Restore window and open the Route Segment Index window. Clicking the **Configure button** will open a new window which provides options for reconfiguring the image sources and upgrading DigitalHIWAY, described on **pages 57 and 58****.**

Show News (currently unavailable)

Clicking the **Show News button** on the Session Save/Restore window will open the DigitalHIWAY News window, as seen below.

From this window you are given options for if and how any DigitalHIWAY news is displayed. Any news available will appear in the white box above the options, based on the setting you choose. Although you can select to not be shown the news again, it is useful to leave this option unchecked as the news is often about upgrades to the software, such as the addition of new features, or the addition of new routes, ramps, and specials available for viewing.

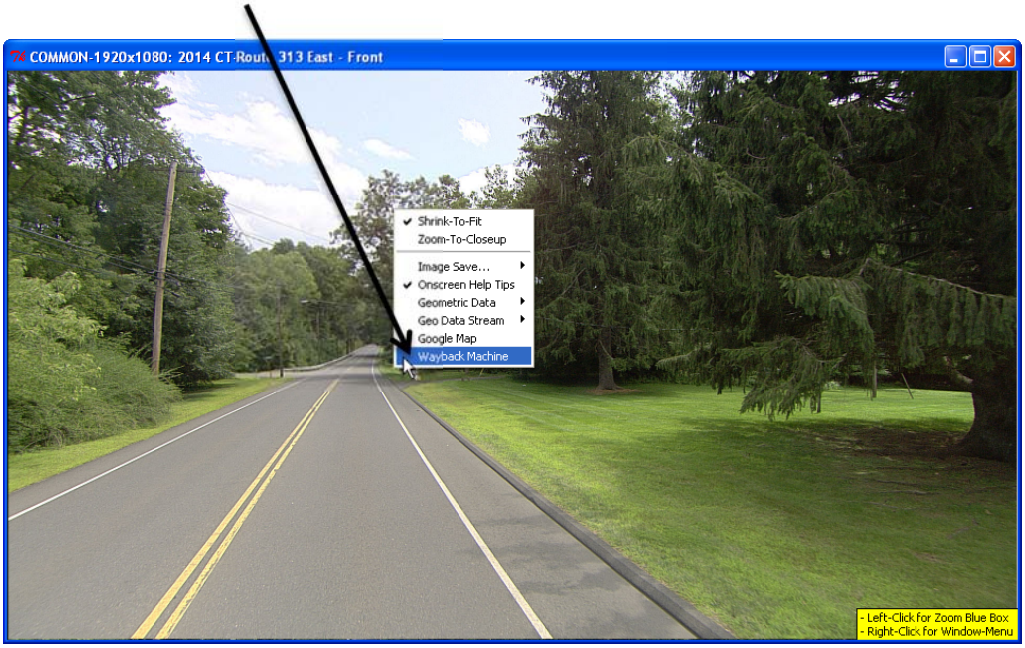
The Wayback Machine

Overview

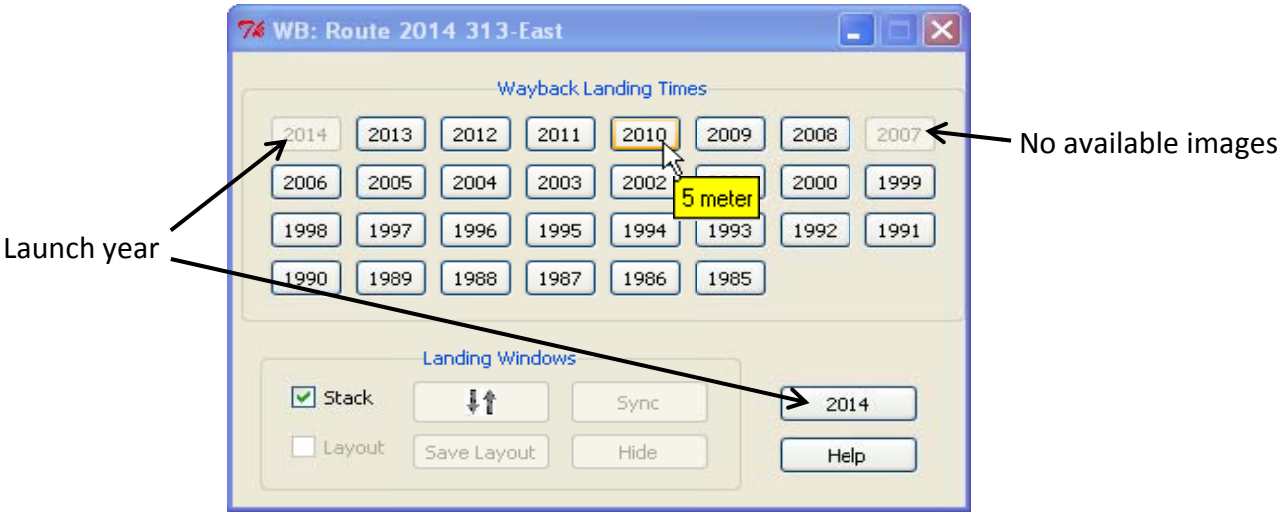
The Wayback machine allows you to instantly jump to the same place along a route that you are currently viewing, but in another year's images. The synchronization is automatic and makes the Wayback Machine easy to use.

Activating the Wayback Machine

To activate the Wayback Machine, select any route between 2006 and the present year, **right-click** on the front image window that opens up, and choose Wayback Machine from the pop-up menu.



This will open the Wayback Machine window which presents an array of potential "Landing Times" to choose from. Click on the year button for the year you wish to see (the year the Wayback Machine was launched from, as well as years for which no Photolog images were taken will be grayed out).



Above: Launch Year Window - 2010 selected; Wayback image will be referenced from year 2014

Note: When you put your cursor over a **Landing Year button**, a yellow box will appear indicating how frequently images were captured. In the picture above, images were collected every five meters.

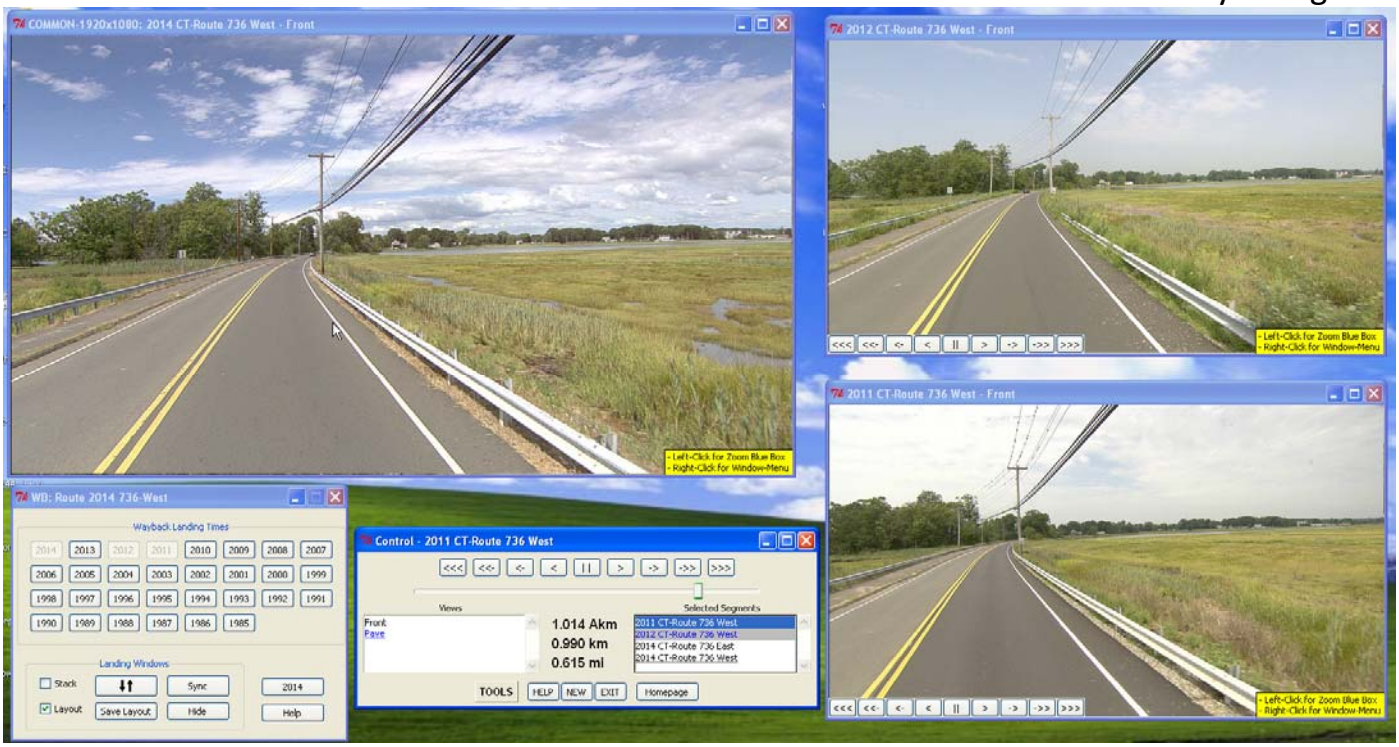
Launch & Landing Windows

The window from which the Wayback Machine is launched is called the Launch Year window. Each "Landing Time" button clicked results in a Landing Window opened on-screen (if 2006 and 2008 are clicked then two separate windows will be opened). Landing Windows are placed on-screen according to the selected Landing Windows option, either **Stack** or **Layout**.

Stack option:
The stack option will center the first Landing Window you open and then stack any additional Landing Windows on top of that one, slightly offset so that each window can still be seen.

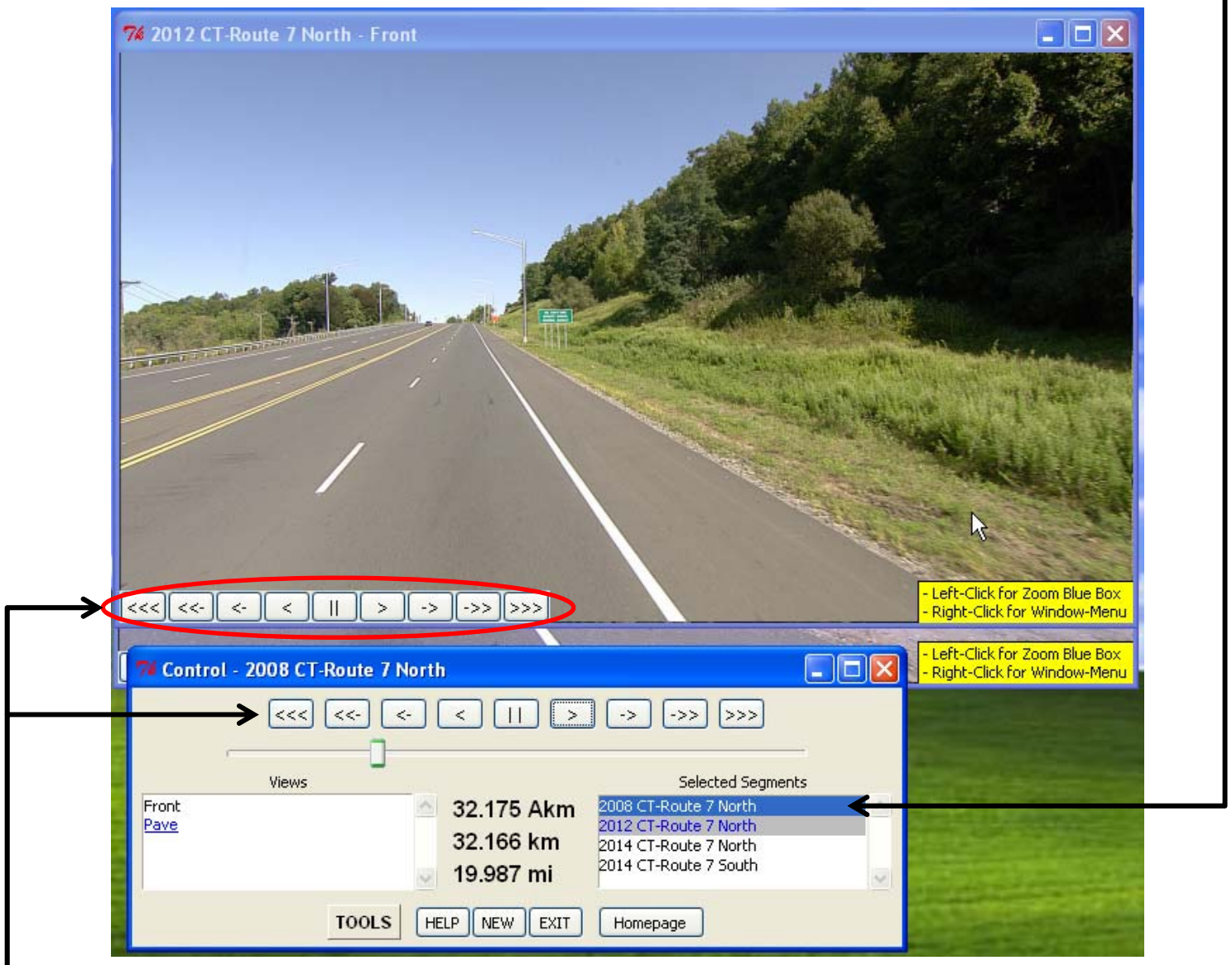
When more than one Landing Window is stacked, you can cycle through each window (bringing it to the foreground) by clicking the **UP/DOWN arrow button**. Left-clicking on the button moves the stacked images in one direction, right-clicking in the other. This allows for the rapid comparison of images without using a lot of screen area.

Layout option:
The layout option will let you define a layout for your Landing Windows. Click on multiple years to appear and move each window where you would like it to be on your screen. Once all images are sized and placed where you want them, **click Save Layout**. If, for instance, you save a layout with three landing windows open in addition to the launch year, the next time you open the Wayback Machine, the launch year, as well as the next three Landing Windows opened, regardless of what year they are, will open in the positions of your saved layout. Any additional Landing Windows will be placed centered on the screen as with the Stack option. The layout may be modified at any time the Layout checkbox is checked. Simply arrange and resize the windows to accommodate for the additional windows and **click** Save Layout again.



Landing Window Navigation

Each time a Landing Window appears on-screen, the Control Panel is directed to the newly mounted year. Just as with the front image window from which you opened the Wayback Machine, each Landing Window will give you the same options when right-clicked, including the ability to view the geometric data for that year's collection.



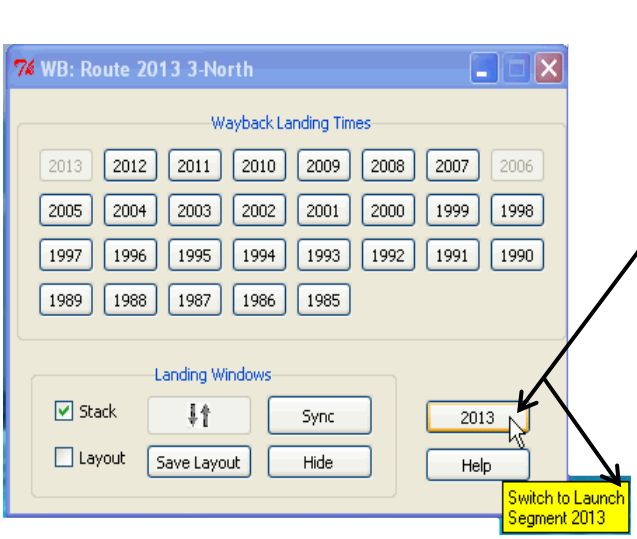
The route can now be controlled from the Control Panel or the miniature playback buttons that appear on all of the Landing Windows.

Note: The default setting for the Wayback Machine is to have these buttons displayed, however, they can be turned on or off by **right-clicking** anywhere on the image (for Landing Windows only) and checking or unchecking the **Control Menu** option from the pop-up menu.

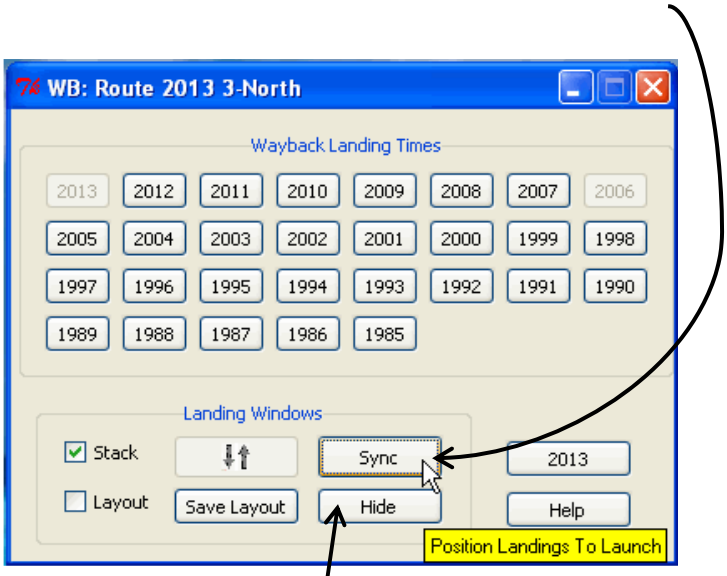
Syncing the Landing Windows

To move all Landing Windows together to another geographic location on the route, follow the steps below.

1. Switch the Control Panel to control the original Launch Window (even if another year's Landing Window has been clicked on, the control panel will only change the images for the year highlighted in blue in the Control Panel's Selected Segments box). This can be done either by clicking directly on the route name on the control panel or by clicking on the **Launch Year button** above the **Help button** on the Wayback Machine main window.



2. Scan the route for your new location.
3. Click the **Sync button** on the Wayback Machine's main window. This will resynchronize all of the Landing Windows to the new location you have selected.



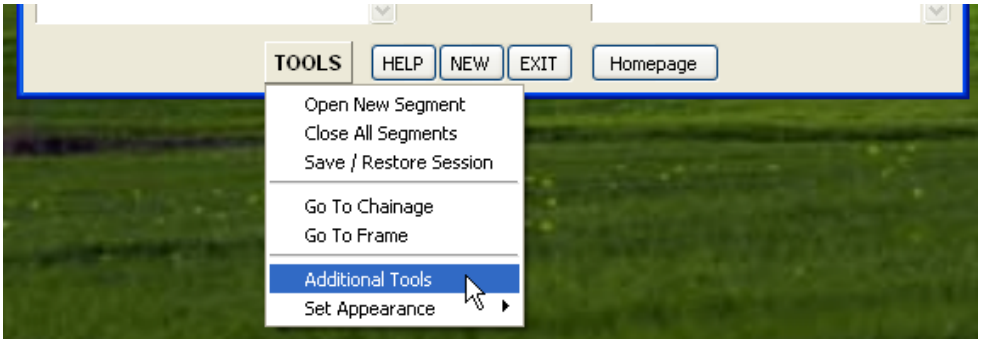
The **Hide button** will minimize all Landing Windows.
Closing the main Wayback Machine window will automatically close all Landing Windows.

The Subset Tool

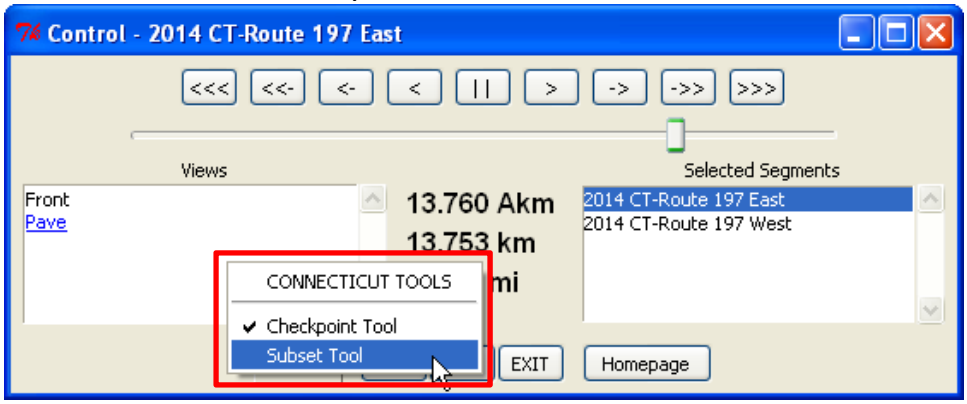
One of the additional tools found in the Control Panel's Tools menu is the **Subset Tool**. This tool allows users to create subsets of images from any route and create JPEG or CJL files from them.

Opening the Subset Tool

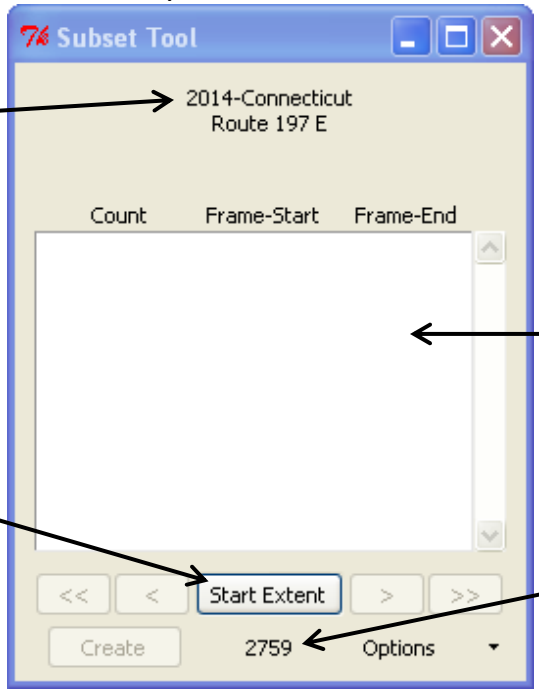
First, click on the **Tools button** on the Control Panel and click "Additional Tools."



The menu outlined below in red will replace the Tools menu. Click Subset Tool to open it.



A new Subset Tool control window will open as shown below.



Route Info

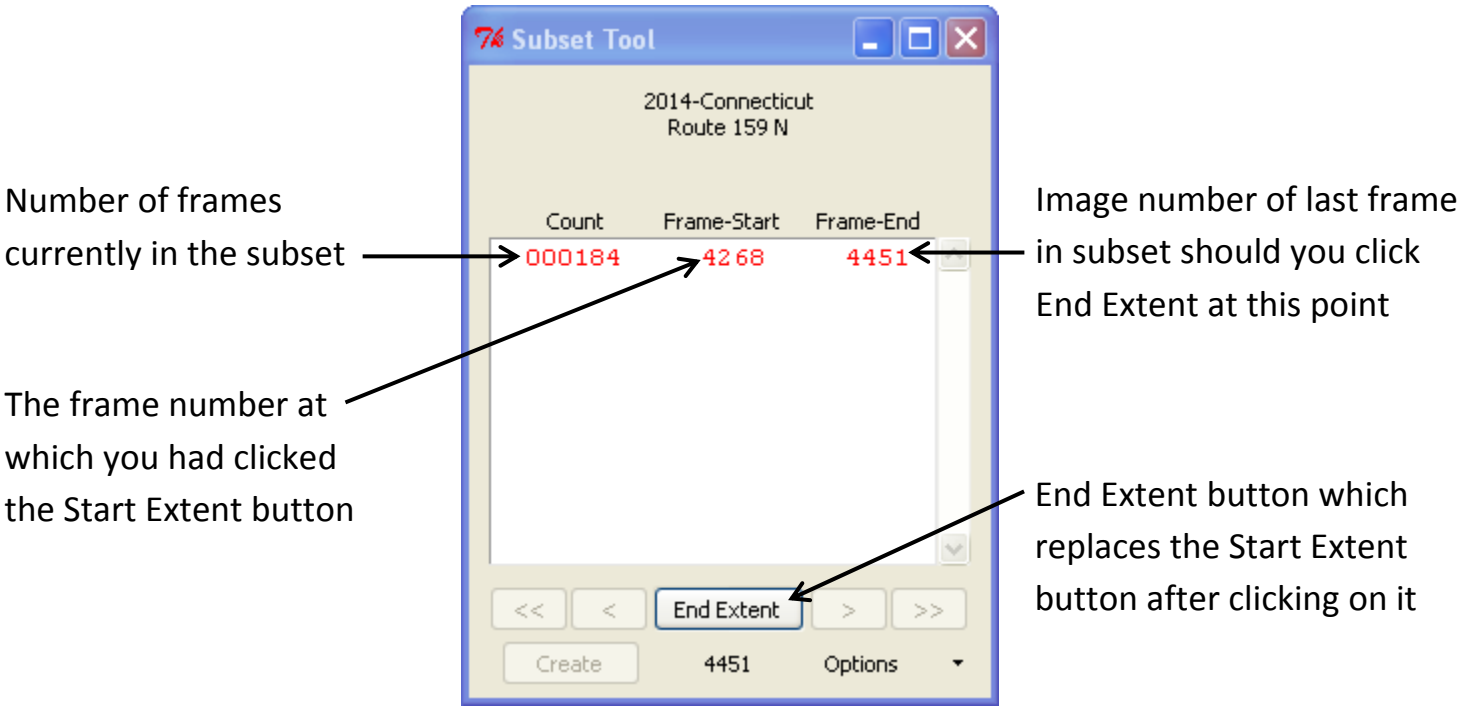
Subset list box

Creates subset starting point from the currently displayed front image

Currently displayed image frame number

Now, using the Subset Tool, you will be able to extract portions of a route to create more manageable files. To do this, scan through the images of your selected route until you come upon the image you want as your starting point. Once you have found the desired image, click on the **Start Extent button**. This marks the current image as the start of your subset.
At this point, you'll have the option of scanning ahead to another image before clicking the **End Extent button** or clicking **End Extent** without scanning ahead to make a single image subset. A single image subset may be useful in marking specific points of interest along a route such as, for instance, the location of speed limit signs.

The image below shows the Subset Tool window *after* clicking the **Start Extent button** and then scanning through the front images to one further along in the route.

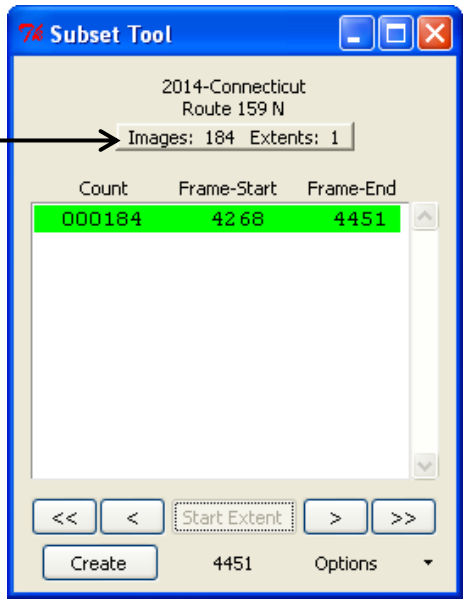


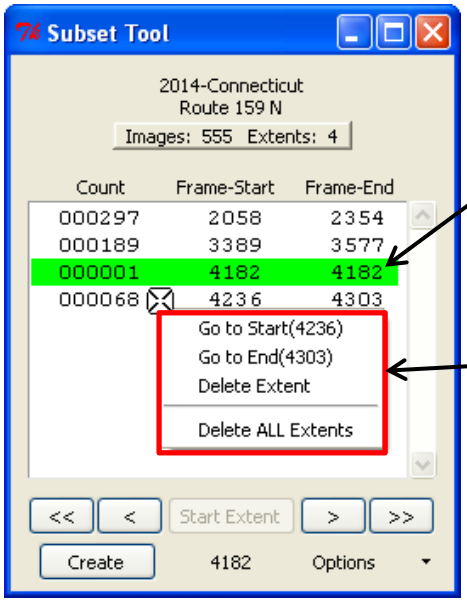
Note: If after clicking the Start Extent button you scan backwards through the images rather than forward, the frame at which you had clicked Start Extent will now be listed under the Frame-End column, whereas the frame number of any image before that point will now fill the Frame-Start column.

After choosing an image to be the end frame of your subset, click the **End Extent button**. The Subset Tool window will now look similar to the image below, with the playback control buttons now available to allow for review of your subset before finalizing it, and the **Create button** available to begin that process.

When multiple subsets are listed, you can sort the list by the starting frame number, either in ascending or descending order, by clicking the **Options button** and choosing either UP or DOWN under the "Sort Extents by Starting Frame Number…" option.

Summary of subsets
Note: The Extents number is the number of all listed subsets and the Images number is the total number of images from those subsets.



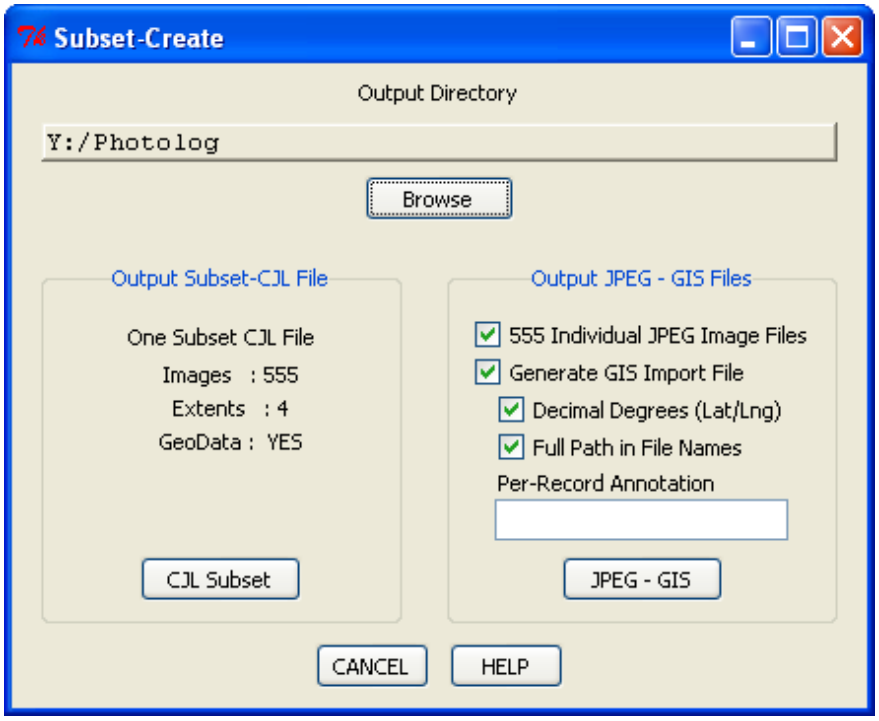


Selected subset

Left-clicking on a subset brings up this menu of options.

Note: When reviewing a subset, the playback control buttons will only allow images within the subset to be displayed. You may also scroll through the images using the Main Control Panel which will allow you to view images beyond the extents of the subset. However, as soon as you view an image outside of the subset's extents, the playback buttons on the Subset Tool window become unavailable while the Start Extent button becomes available again to allow for the creation of a second subset.

When you are finished reviewing the subset(s), click the **Create button** to open up the Subset-Create window, as pictured below. Doing so will minimize all other DigitalHIWAY windows.

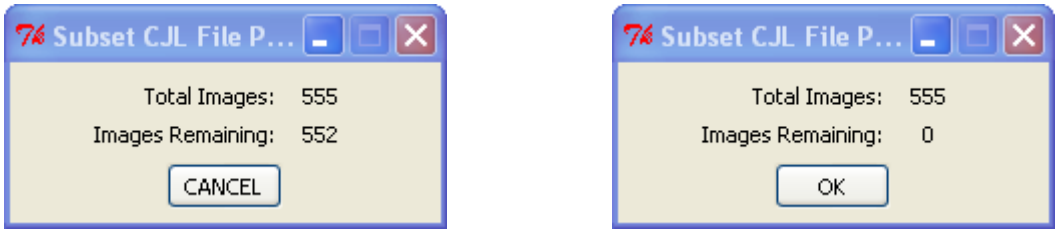


There are two ways to output the subsets you've created, but in order to use either of these options, a folder where the output files will be saved must first be selected using the **Browse button**.

Creating a CJL File

Clicking the **CJL Subset button** will create a single file containing all of the JPEG images from your subsets along with the geometric data accompanying each image. The outputted CJL file can then be opened using the TOFU or RoadPeek viewing applications.
Note: Choosing to create a CJL File will combine all of the subsets into one file rather than a separate file for each subset you've defined.

After clicking the CJL Subset button, a new window will appear showing the progress of the CJL creation (shown left) and when complete, will prompt you to press "Ok" to continue (shown right).



Click OK again when the Subset-Create window reappears to finish the process and re-open the other DigitalHIWAY windows that had been on your screen, or remain in the window to create another output.

Creating JPEG-GIS Files

To output your subsets as individual JPEG files, the same steps are followed. However, there are several options that can be turned on or off when using this method to output subsets. A more detailed explanation of the following options can be found by clicking on the **Help button** in the Subset-Create window.

Individual JPEG Image Files

Choosing this option will create a separate JPEG file for each of the images in the subset extent. These images do not contain the geometric data originally associated with them.

Generate GIS Import File

Choosing this option will create an ASCII GIS Import File containing the geometric data originally associated with the images.

Decimal Degrees (Lat/Lng)

Choosing this option will cause the latitude and longitude values to be converted from the Photolog format into decimal degrees and changes the field names in the geometric data files to reflect that change.

Full Path in File Names

Choosing this option causes the filename of each record in the file to include the directory path and allows for maximum ease-of-use for GIS importation.

Per-Record Annotation

If a "Per-Record Annotation" string is entered, it is appended as the last field in each record of the GIS Import file.

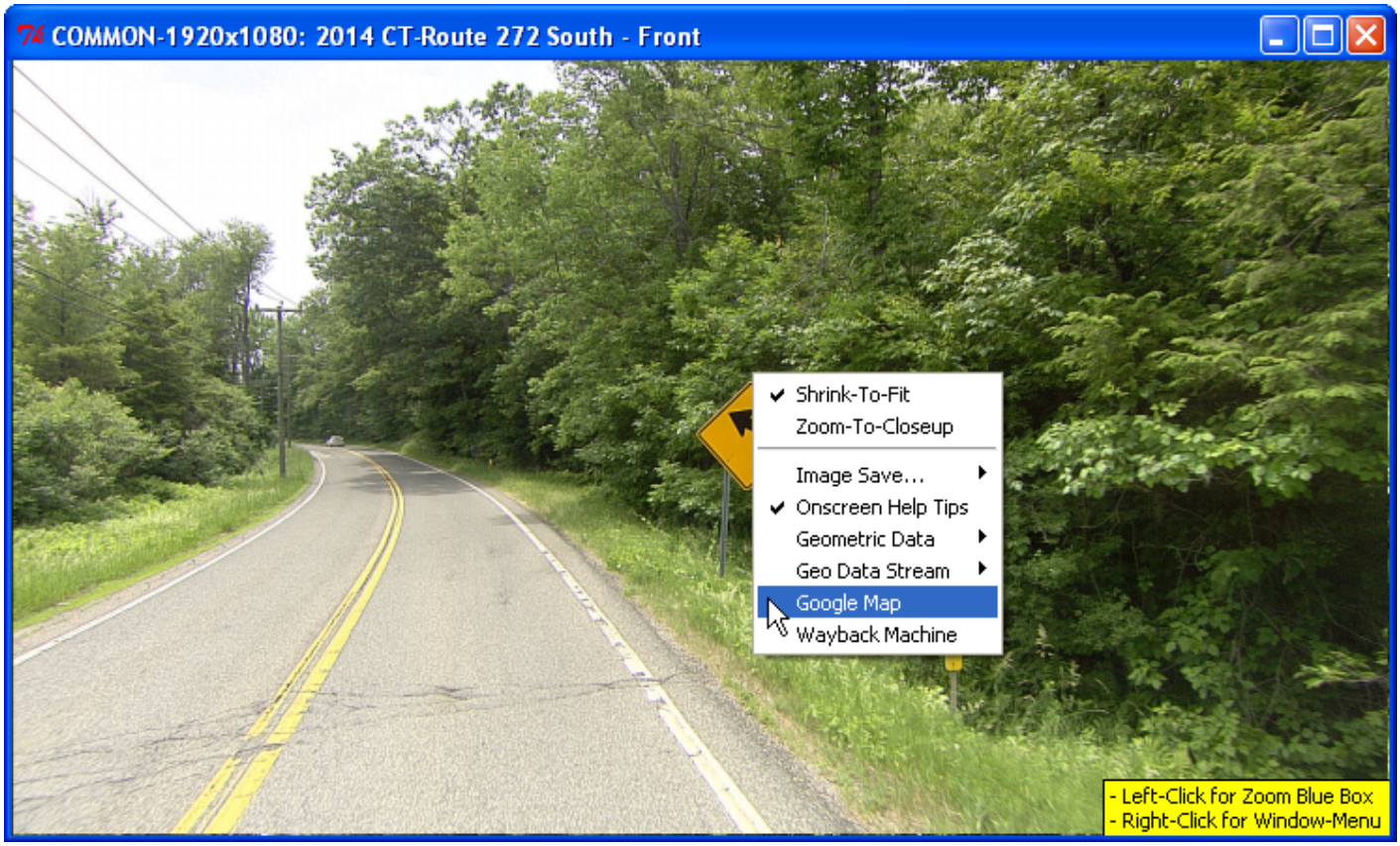
Each jpeg is saved with the **"LAT/LNG"** and the mileage of each picture in km according to DigitalHIWAY.

The Google Map Feature

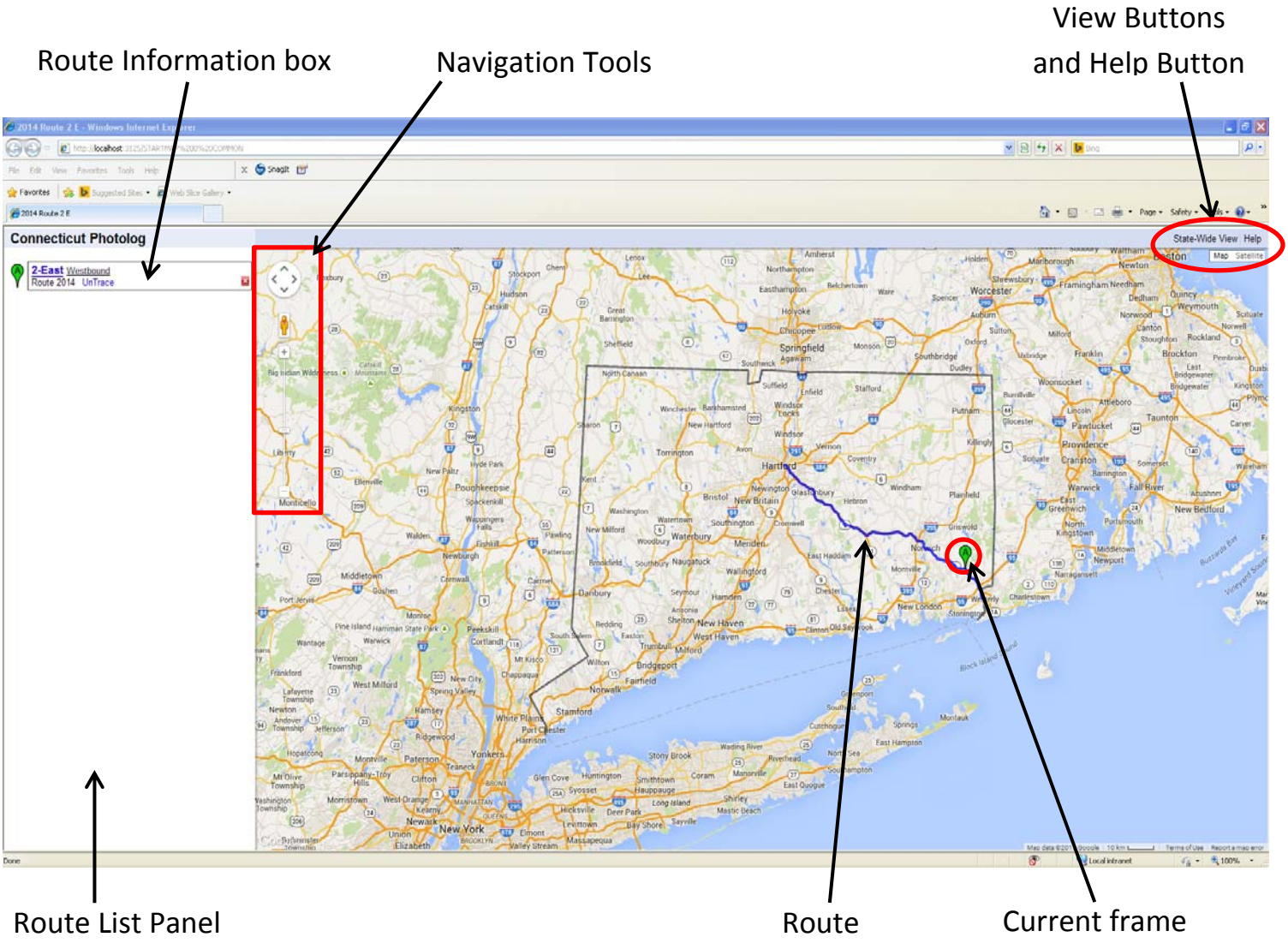
Overview: DigitalHIWAY's Google Map feature is a tool which allows users to display the route(s) they are viewing in DigitalHIWAY as lines drawn on a map with the location of the frame being viewed marked on the map with a balloon marker. Each time that the front or pavement images are changed in DigitalHIWAY or put into continuous scrolling, the balloon marker in the Google Map will change to reflect the image's newest location.

Opening the Google Map

After opening a route in DigitalHIWAY, **right-click** anywhere within the front image that appears and select "Google Map" from the drop down menu.

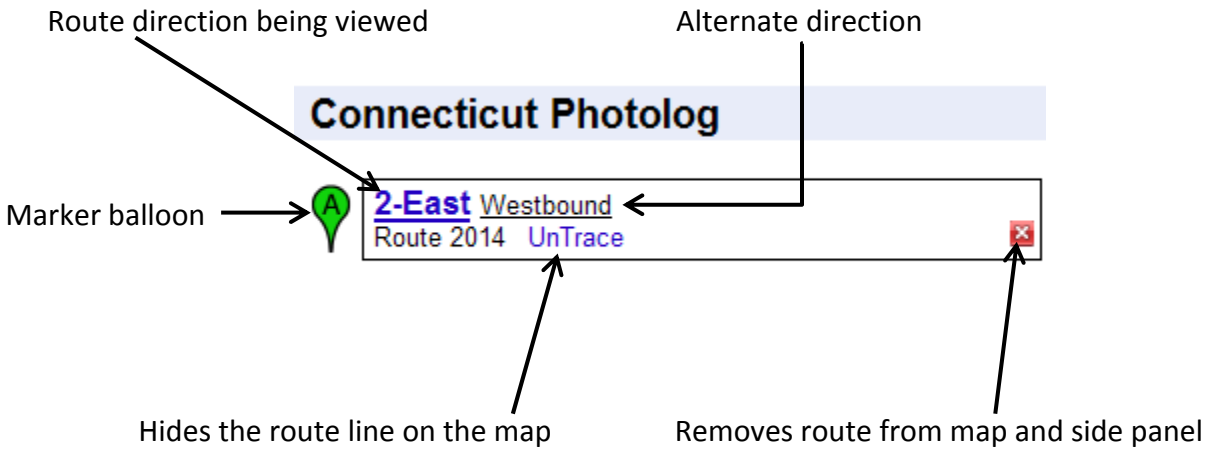


After clicking on “Google Map,” an Internet Explorer window will open up displaying a Google Map of Connecticut with the route you’ve selected drawn on as a blue line. A green or red balloon marked “A” will also appear, marking the GPS coordinates of the van’s location where the front image currently being displayed was captured. To the left of the map will be a side panel in which the route or routes you have opened will be listed. The Google Map screen will look similar to the one below.

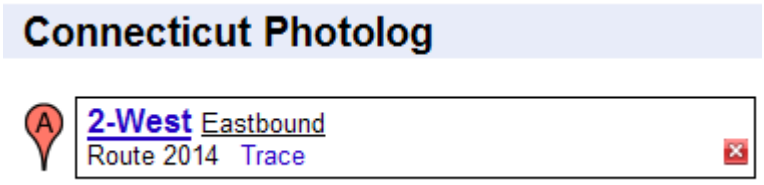


After the first route has been opened in the map, each subsequent route’s balloon marker will be given the following letter of the alphabet.

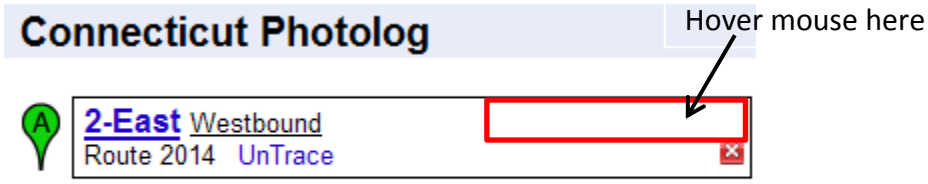
Here is a closer look at the Route Information Box:



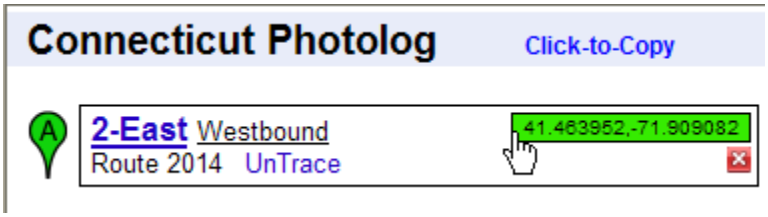
Notice that if you click on the link for the route's alternate direction (Westbound in the picture above), the route directions will switch and now look similar to the image below. This change will affect both the map feature and DigitalHIWAY's various windows. Also note that the balloon, though it will still be in the same place on the map, will now be red in both the map and the Route Information Box to indicate that you are now viewing the route in the opposite direction than the one from which you opened the route, as seen below.



Point the mouse over the empty space in the upper right corner of the box to have the coordinates of the currently selected frame (where the balloon is) appear on screen with an option to click to copy those coordinates for later use.

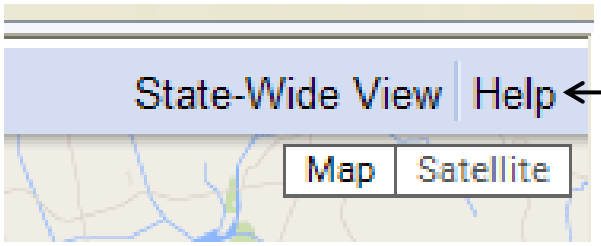


Pointing the mouse there will cause the Route Information Box to appear as it does below, until the mouse pointer is removed from that area again.



The View Buttons

In the upper right corner of the Google Map screen are a few useful buttons, shown below.

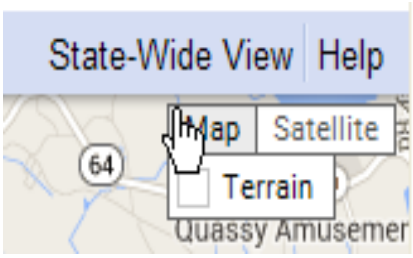


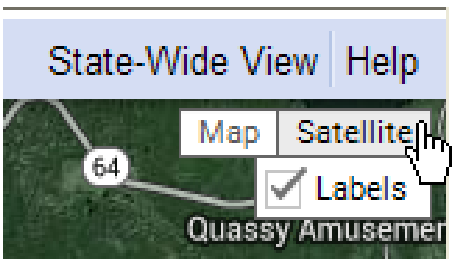
Click for help on the Google Map feature of DigitalHIWAY

Clicking the **State-Wide View button** zooms the map in or out and centers it so that the entire state of Connecticut can be seen on the map. The **Help button** will open up a help window specific to the Google Map feature of DigitalHIWAY.

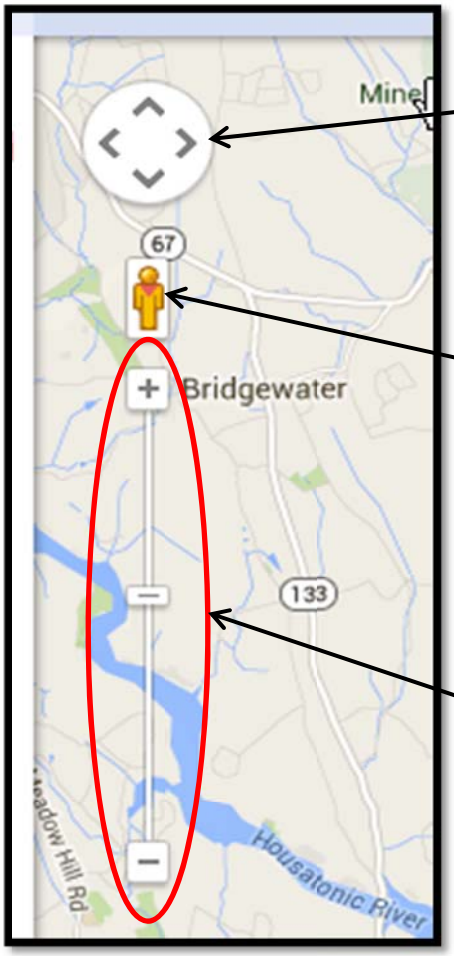
Beneath those two buttons are two more buttons which offer some different options for how to view the map. The default setting of the Google Map feature is to display the route in map view with the terrain turned off. When you **point the mouse** at the **Map button**, the option for the **Terrain View** appears, which when turned on will display the relief of the land in addition to roads (when zoomed in enough), water, and parks that are seen in the default view.

Alternatively, clicking the **Satellite button** will switch the map to a satellite view of the land with an option to turn labels on or off.





Navigation Tools



Navigation Arrows: Click the arrows to pan the map incrementally. You can also pan the map by clicking and dragging the map itself to the position desired.

Street View Tool: Click and drag the orange person symbol to any location on the map to enter Street View, which allows you to navigate the streets from a perspective similar to DigitalHIWAY's front images.

Zoom Tool: Click the plus or minus signs to zoom in or out one interval at a time. Or, click and grab the slider to zoom in or out much faster. With both methods of zooming in or out, whatever was at the center of your screen will remain centered.

Other methods of zooming in and out:

- In addition to the Zoom Tool, users can also zoom in or out by double left or right-clicking the mouse. Left-clicking zooms in on the map while right-clicking will zoom the map out, both in fixed increments. This method will not keep the map centered but instead will zoom towards or away from where the mouse is clicked when left-clicking and right-clicking, respectively.
- Rolling the mouse wheel forward or backwards will similarly zoom in or out on the map, respectively, but with the benefit of being able to zoom multiple levels at once.

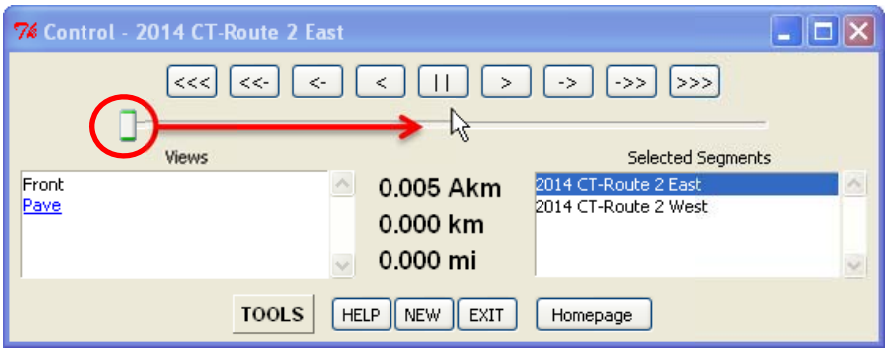
Opening a new route

A great feature of using the Google Map tool is the ability to display multiple routes on the map at the same time. Each time you open a new route in DigitalHIWAY, **right-click** the front image, and select Google Map, the new route will be drawn on the existing map and listed in the Route Information side panel. Additionally, had you been zoomed in close on one route when you open another, the map will revert to the State-Wide view.

Note: A maximum of twenty-six routes are able to be displayed simultaneously in the Google Map.

How DigitalHIWAY and Google Maps Interact

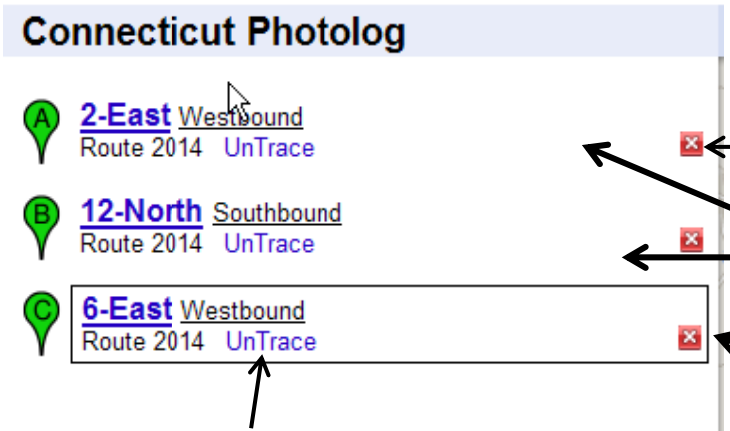
In DigitalHIWAY, grab the image slider with your mouse and drag it to somewhere in the middle of the slider strip, or otherwise change the front image using the playback buttons or the checkpoint list.



Notice how on the Google Map the green (or red) balloon marker has changed to mark the location of the new point along the route which you have just selected. Also note that if you had zoomed in on the Google Map so that the balloon was not displayed on screen before changing the image, the map will now adjust automatically, while remaining at the same zoom level, to make the balloon in its new location appear centered on your screen. If the previous balloon location was on screen prior to changing the image, the map will not adjust to center the new balloon location.

Closing and Untracking routes from the Google Map

In the event that your map becomes too cluttered with different routes or if you are simply done using one or more of them, there are two options to clear the map screen up a bit, as shown in the picture below.



Click the "X" buttons to remove a route from the map and from the Route Information side panel.

Unselected routes

Currently selected route – The zoom level of any route can only be changed when the route is selected.

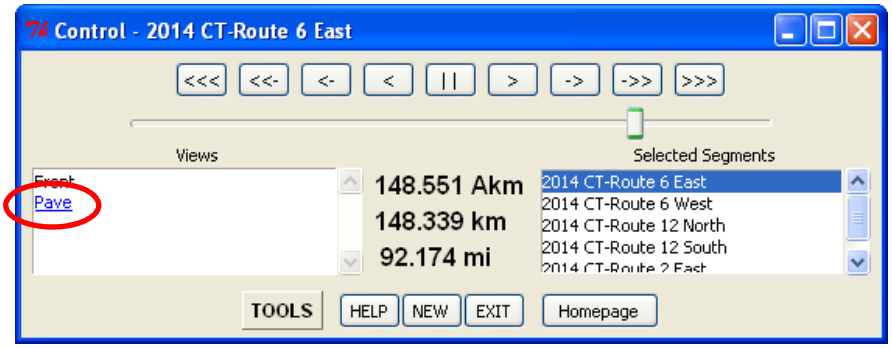
Click the **UnTrace button** to turn off the display of the route from the map only. The route information will remain in the Route Information side panel and the route's marker balloon will remain and still be moveable on the map.

Note: You are still able to drag a route's balloon marker and drop it to different points along the route even after you've untraced it from the map display. When doing so, the balloon will fall into place at the closest point on the route from where you attempted to drop it. **Clicking UnTrace** will also change the button to the word "**Trace"**, which when clicked will retrace the route on the map.

Note on Closing Routes: When closing a route within the Google Map window, the route will only be removed from the map and Route Information Side Panel and will not close the route in DigitalHIWAY.
However, closing a route in DigitalHIWAY will also close/remove the route from the Google Map.

Pavement Images and the Google Map

On the control panel, click the underlined **Pave** link in the Views box.



As mentioned earlier in this manual, clicking **Pave** will open up a new window displaying images of the pavement taken at approximately the same point along the route as the front image currently on display.

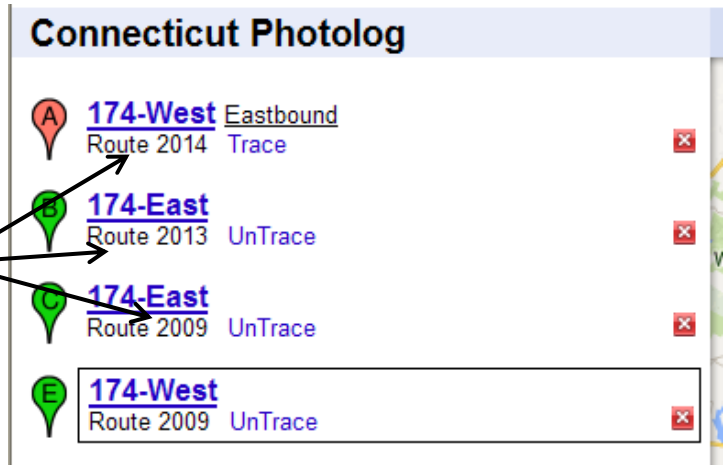
There are two useful things to know about the pavement images window and its relation to the Google Map application.

1. Dragging the balloon along the route in the Google Map will cause the pavement image window to change to reflect the new balloon location just as the front images window does.
2. You can **right-click** anywhere within the Pavement Images window and select "Google Map" to open up the map and display a route just as you would through the Front Images window.

The Wayback Machine and the Google Map

As with any route that you have open in Digital HIWAY, a route opened through the Wayback Machine can similarly be displayed in the Google Map. Notice that you will not have the option to switch back and forth between the Log and Reverse directions of a Wayback route on the map, however, both the Log and Reverse directions of a Wayback Machine route can be opened separately.

Displaying different years of the same route



Note: Unless a route has changed in length from one year to another, all lines drawn for the same route will appear the same and be placed one on top of the other. To see if a route has changed, you may need to un-trace one or more of them.

Google Maps Tips and Tricks

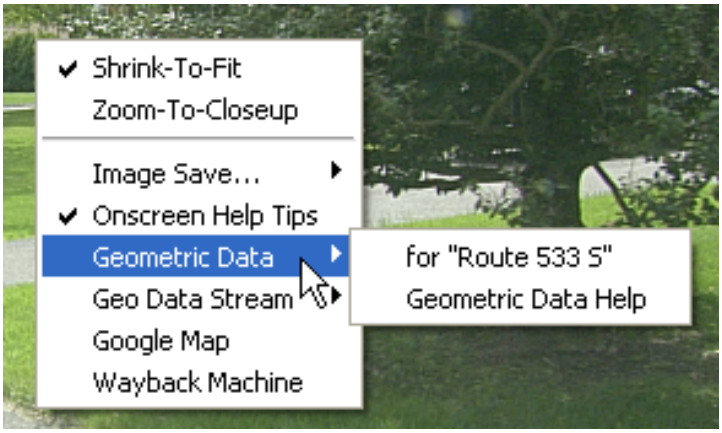
- The frequency at which images are collected has changed over the years from sixteen, ten, and five meter intervals. Therefore, when comparing different years of the same route with the Wayback Machine, the balloon markers, depending on the years chosen, will move forward in different increments and when using the **Sync button,** may not always sync perfectly.
- Hovering your mouse cursor over a balloon marker will display, in a tan box by your cursor, the route name and the year that the route was collected.
- To change the zoom level of a particular route, click on the route name from the side panel – this will zoom you in or out to the default zoom level – and then zoom to the level desired. Next, simply click either on the balloon marker on the side panel or on the route name to set the new zoom level. Now, anytime that you click the route name, the map will zoom in or out to the level you set it to. However, this only works when the route name is not already selected as it would otherwise be subject to being changed again.
- Zooming in or out and then clicking the balloon on the sidebar or the map will not set a new zoom level. However, when the balloon marker (on the map) is off screen, clicking the side panel balloon will change the zoom setting.

Geometric Data

Overview

One of DigitalHIWAY's newest improvements is the ability to extract the Geometric Data collected by the vans and output it in various formats that will allow users to easily analyze the data as well as be able to incorporate the data into different software applications.

To get started, **right-click the front image** of the route you wish to view the data for and notice the options for **Geometric Data** and **Geometric Data Stream**.



Geometric Data Option

Choosing this option will open the Geometric Datastreams window which provides users the ability to customize which types of data will be displayed and how they will be extracted/exported for use elsewhere (ArcGIS, Excel spreadsheets, etc.). See image on **page 48**.

Geometric Data Stream Option

As seen in the right image above, when you point your mouse cursor over this option, a menu listing each type of geometric data the van collects will appear. Unlike the Geometric Data option that allows you to choose multiple geometric data types, the Geometric Data Stream option allows you to choose only one, which upon clicking, will open up in the Geometric Datastreams window with the data already displayed and with most of the other options "hidden" from view. See image on **page 51**.

Types of Geometric Data

Chainage (Station Chainage) - Photolog van's odometer records (log (logbook) direction determines ascending or descending values)

IRI (IRI Roughness Information) – International Roughness Index values for left and right wheel paths as calculated from the inertial profiling system

Ride (Roughness) – Unlike IRI roughness, Ride values indicate the quality of the ride on a scale of zero to five with a 0 representing poor ride quality and 5 representing excellent ride quality.

Smartbar (Raw Rut-Sensing Information) – Raw data from ultrasonic rut-sensing system that detects distance to roadbed from the photologging van's front sensors

Smartruts (Processed Rut-Sensing Information) – Left and right wheel path rut depths displayed in millimeters (3 or 5 point calculation)

GPS (Global Positioning System Information) – Global Positioning System records indicate the latitude and longitude position of the Photolog van (processed via POSLV)

Gyro (Heading, Pitch Information) – Van compass-heading and van body pitch values (tilt forward or tilt back) derived from on-board gyroscope subsystem

Grade (Processed Road Grade Information) – Road grade as computed in real-time (positive values indicate van was going up)

Roll (Roll and Crossfall Information) – Van body roll (from gyros) and processed/calculated crossfall/crossgrade values from rutbar (positive values indicate road tilts down to right)

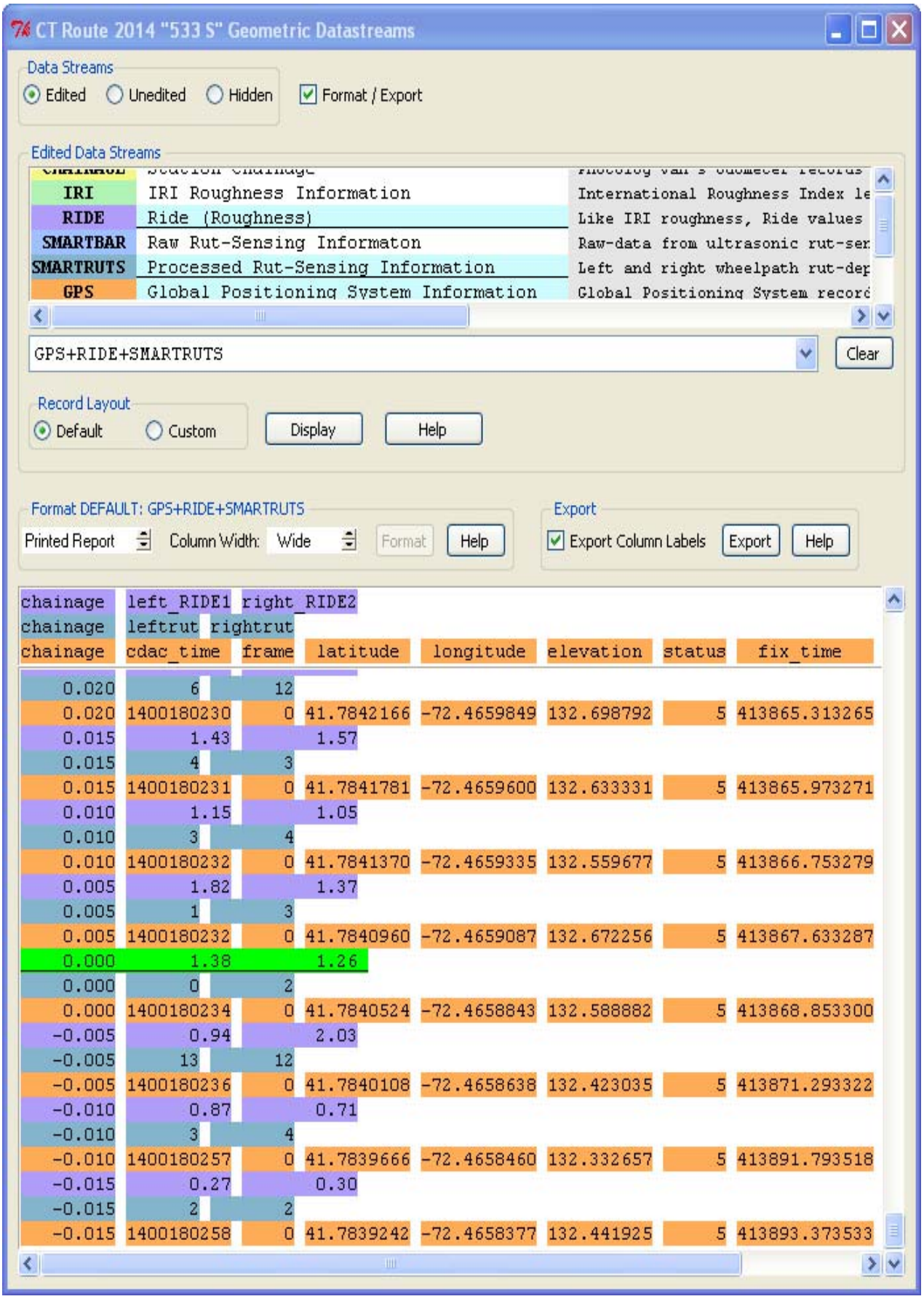
Rater (Field Events – RR, Billboard, Out-of-Lane) – Rating-Events are in-van, real-time keyboard keystrokes signifying certain events have occurred

Error (Van Subsystem Error Events) – When van sensor subsystems encounter problems or errors, they create records of this type.

Header (Van Session Information) – Field-Photologging Session Identifying information entered by van operator at start of van operation

End Section (Van-Session End Information) – A record of chainage, time, and speed collected at the end of each field-photologging session

The Geometric Datastreams window after choosing the Geometric Data option (With data selected and displayed)



chainage	left_RIDE1	right_RIDE2					
chainage	leftrut	rightrut					
chainage	cdac_time	frame	latitude	longitude	elevation	status	fix_time
0.020	6	12					
0.020	1400180230	0	41.7842166	-72.4659849	132.698792	5	413865.313265
0.015	1.43	1.57					
0.015	4	3					
0.015	1400180231	0	41.7841781	-72.4659600	132.633331	5	413865.973271
0.010	1.15	1.05					
0.010	3	4					
0.010	1400180232	0	41.7841370	-72.4659335	132.559677	5	413866.753279
0.005	1.82	1.37					
0.005	1	3					
0.005	1400180232	0	41.7840960	-72.4659087	132.672256	5	413867.633287
0.000	1.38	1.26					
0.000	0	2					
0.000	1400180234	0	41.7840524	-72.4658843	132.588882	5	413868.853300
-0.005	0.94	2.03					
-0.005	13	12					
-0.005	1400180236	0	41.7840108	-72.4658638	132.423035	5	413871.293322
-0.010	0.87	0.71					
-0.010	3	4					
-0.010	1400180257	0	41.7839666	-72.4658460	132.332657	5	413891.793518
-0.015	0.27	0.30					
-0.015	2	2					
-0.015	1400180258	0	41.7839242	-72.4658377	132.441925	5	413893.373533

Breakdown of the Geometric Data window

Data Stream options to select geometric data streams as either Edited (processed data) or Unedited (raw data)

Click this to hide the Edited Data Streams and Record Layout boxes as well as the Display and Help buttons. This can only be clicked after geometric data has been selected and displayed and will expand the data box.

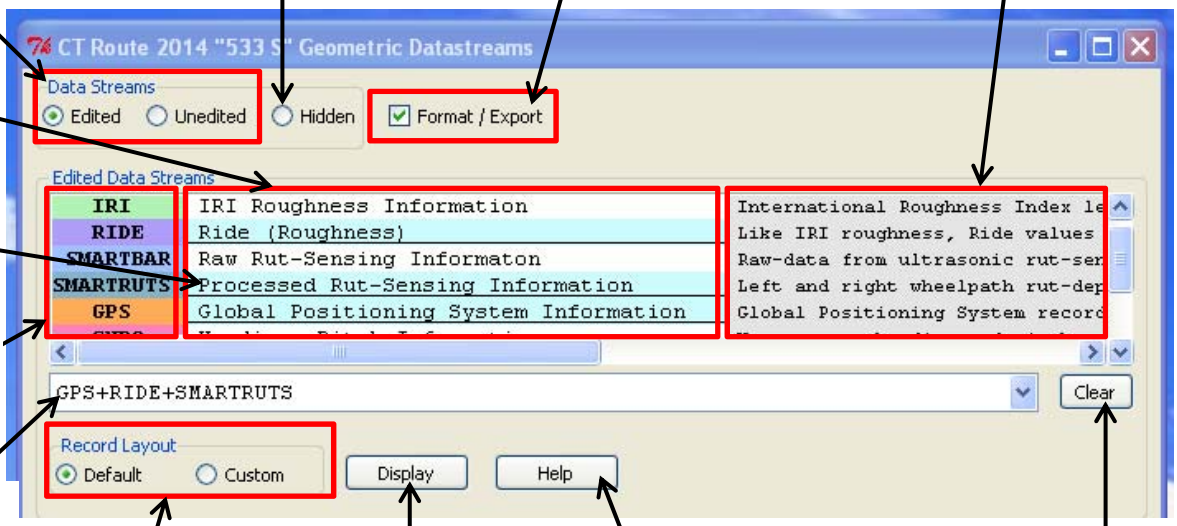
Check this box to display the Format/Export boxes (unchecked by default). These boxes will not be hidden when the Hidden button is checked.

Full description of data types

Brief description of data types (click to select/deselect)

Selected Data Streams (blue highlight)

Types of Geometric Data



Displays which data streams are currently selected for the data box. Clicking opens a dropdown menu that provides an easier way to select multiple data streams by allowing you to choose from any past selections you've made.

Click to Display the selected Data or to choose Custom data (see **page 53**)

Click **Default** to have all information displayed for each data type selected or click **Custom** to choose exactly which information will be displayed. See paragraph below for more information.

Click to bring up a Help window specific to Edited Data Streams. Similarly, if Unedited is checked, the Help window will be specific to Unedited Data Streams.

Clears the data selections (does not clear the data itself)

With the **Default** option checked in the Record Layout box, every subcategory of data within the chosen datastreams will be displayed. However, with the **Custom** option checked, you will be able to choose exactly which subcategories of data you wish to view (you will be able to choose after clicking the **Display button**). For example, if you want to look at IRI, the default option will give you both the left and right IRI numbers, whereas the custom option will give you the choice of displaying just one or the other.
See **page 53** for more information on selecting data fields.

☼**Tip:** Hold the mouse right-clicked over any of the Data Streams to view a list of each subcategory of data within that stream.

Breakdown of the Geometric Data window (continued)

Choose to format the data for easy on-screen or printing use or have the data formatted to make importing the data into databases or spreadsheets easier.

Choose between a wide or compact formatting style.

Click for Help on Exporting

Check to have the column header labels as the first line of the export file

Click to Export the data (A window will open asking you where you'd like to save the export file).

Choose to have each field of data separated by a Comma, Space, or Tab.

Click to reformat the data display to reflect any formatting changes you've made

Click for Help on Formatting

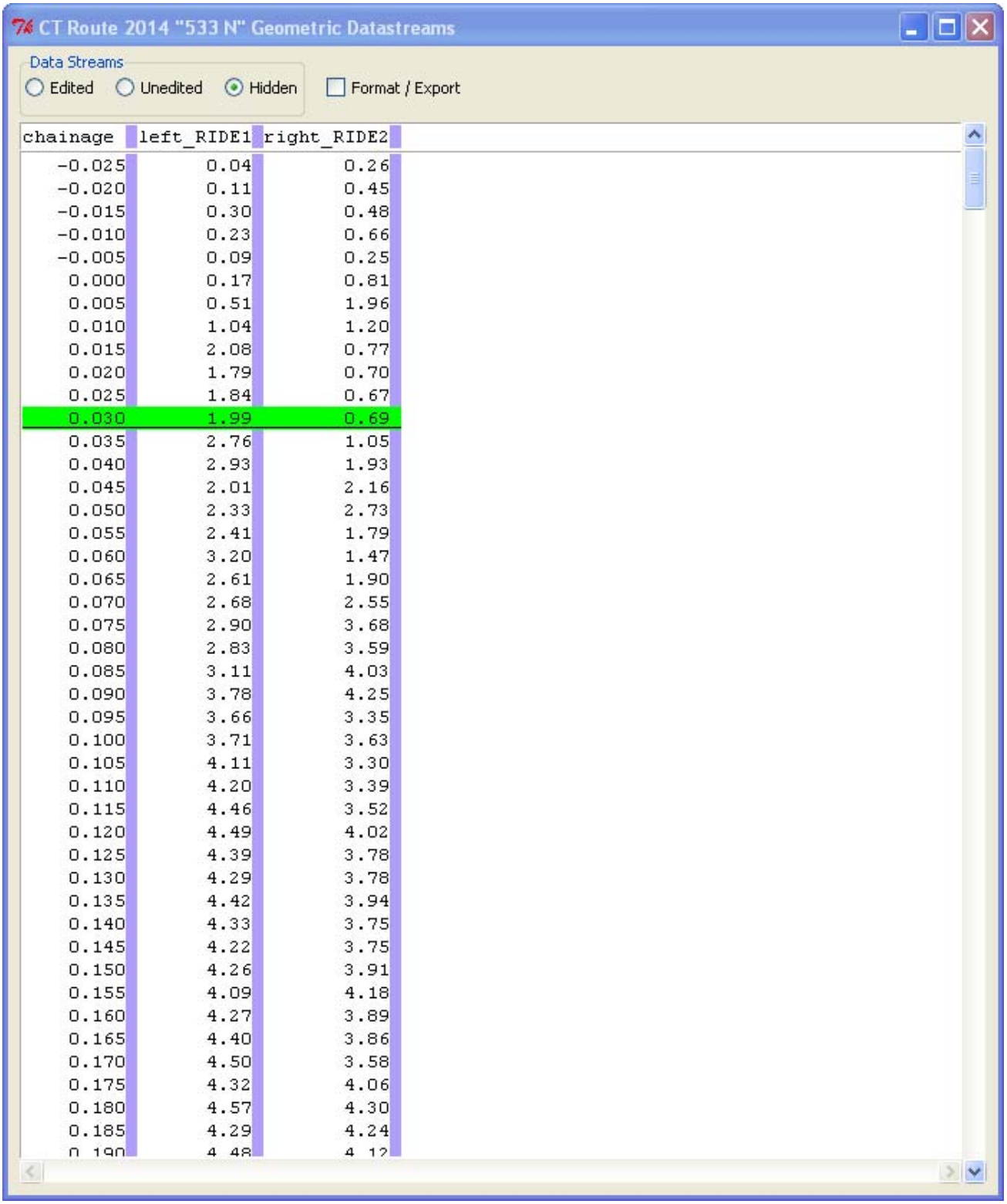
Headers for each of the data types selected

Data for the currently selected frame (front image)

Processed Data – Each type of data you've selected to display here will have its own line for each image frame. (The highlighted frame will only appear on the first data stream selected.)

chainage	left_RIDE1	right_RIDE2					
chainage	leftrut	rightrut					
chainage	cdac_time	frame	latitude	longitude	elevation	status	fix_time
0.025	2	4					
0.025	1400180230	0	41.7842593	-72.4660136	132.816498	5	413864.713259
0.020	1.41	0.96					
0.020	6	12					
0.020	1400180230	0	41.7842166	-72.4659849	132.698792	5	413865.313265
0.015	1.43	1.57					
0.015	4	3					
0.015	1400180231	0	41.7841781	-72.4659600	132.633331	5	413865.973271
0.010	1.15	1.05					
0.010	3	4					
0.010	1400180232	0	41.7841370	-72.4659335	132.559677	5	413866.753279
0.005	1.82	1.37					
0.005	1	3					
0.005	1400180232	0	41.7840960	-72.4659087	132.672256	5	413867.633287
0.000	1.38	1.26					
0.000	0	2					
0.000	1400180234	0	41.7840524	-72.4658843	132.588882	5	413868.853300
-0.005	0.94	2.03					
-0.005	13	12					
-0.005	1400180236	0	41.7840108	-72.4658638	132.423035	5	413871.293322
-0.010	0.87	0.71					
-0.010	3	4					
-0.010	1400180257	0	41.7839666	-72.4658460	132.332657	5	413891.793518

Geometric Datastream window after choosing the Geo Data Stream Option
(Picture below is with Ride as the selected Data Stream)



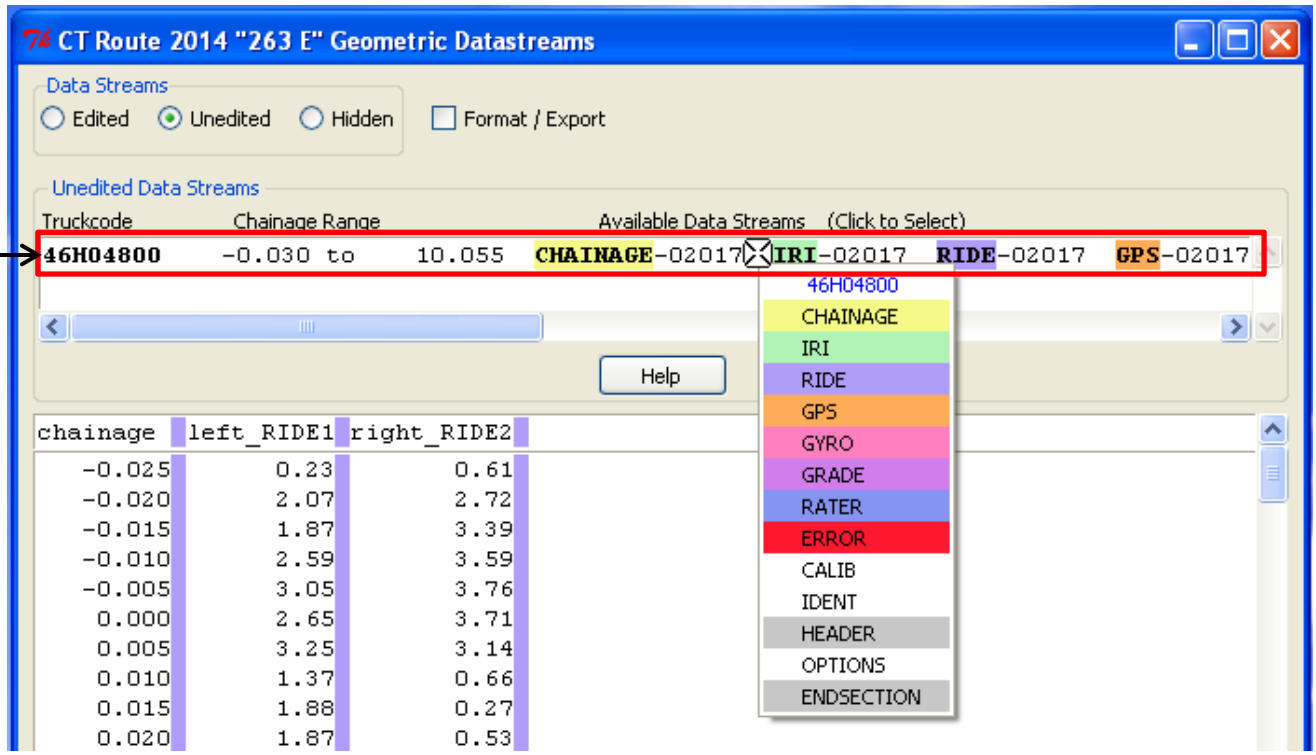
chainage	left_RIDE1	right_RIDE2
-0.025	0.04	0.26
-0.020	0.11	0.45
-0.015	0.30	0.48
-0.010	0.23	0.66
-0.005	0.09	0.25
0.000	0.17	0.81
0.005	0.51	1.96
0.010	1.04	1.20
0.015	2.08	0.77
0.020	1.79	0.70
0.025	1.84	0.67
0.030	1.99	0.69
0.035	2.76	1.05
0.040	2.93	1.93
0.045	2.01	2.16
0.050	2.33	2.73
0.055	2.41	1.79
0.060	3.20	1.47
0.065	2.61	1.90
0.070	2.68	2.55
0.075	2.90	3.68
0.080	2.83	3.59
0.085	3.11	4.03
0.090	3.78	4.25
0.095	3.66	3.35
0.100	3.71	3.63
0.105	4.11	3.30
0.110	4.20	3.39
0.115	4.46	3.52
0.120	4.49	4.02
0.125	4.39	3.78
0.130	4.29	3.78
0.135	4.42	3.94
0.140	4.33	3.75
0.145	4.22	3.75
0.150	4.26	3.91
0.155	4.09	4.18
0.160	4.27	3.89
0.165	4.40	3.86
0.170	4.50	3.58
0.175	4.32	4.06
0.180	4.57	4.30
0.185	4.29	4.24
0.190	4.48	4.12

Unedited Data Streams

Unedited Data Streams are **not** synchronized with the images when displayed and are available for historical or special purposes. For most uses, the Edited Data Streams are the best choice.

It should also be noted that there are additional fields of data when viewing the unedited data streams (these have a white background on the data stream menu). These fields carry information about the operational parameters of the van software during the collection session and do not reflect roadway conditions.

To view the menu of data stream options, **left-click** anywhere along the top line in the Unedited Data Streams box.



Note: Because the Unedited Data is not synchronized with the images, you will not be able to click a line of data to cause the Front Image window to change accordingly as you can with Edited Data. However, if you switch to unedited data after you have already displayed Edited Data, that data and the highlighted frame will remain on screen until you update the Data box by choosing an Unedited Data Stream.

Custom Record Layout

To customize which pieces of data will be displayed and ready for export, first choose the **Custom** option from the **Record Layout** box, as seen below, and then click the **Display button**.

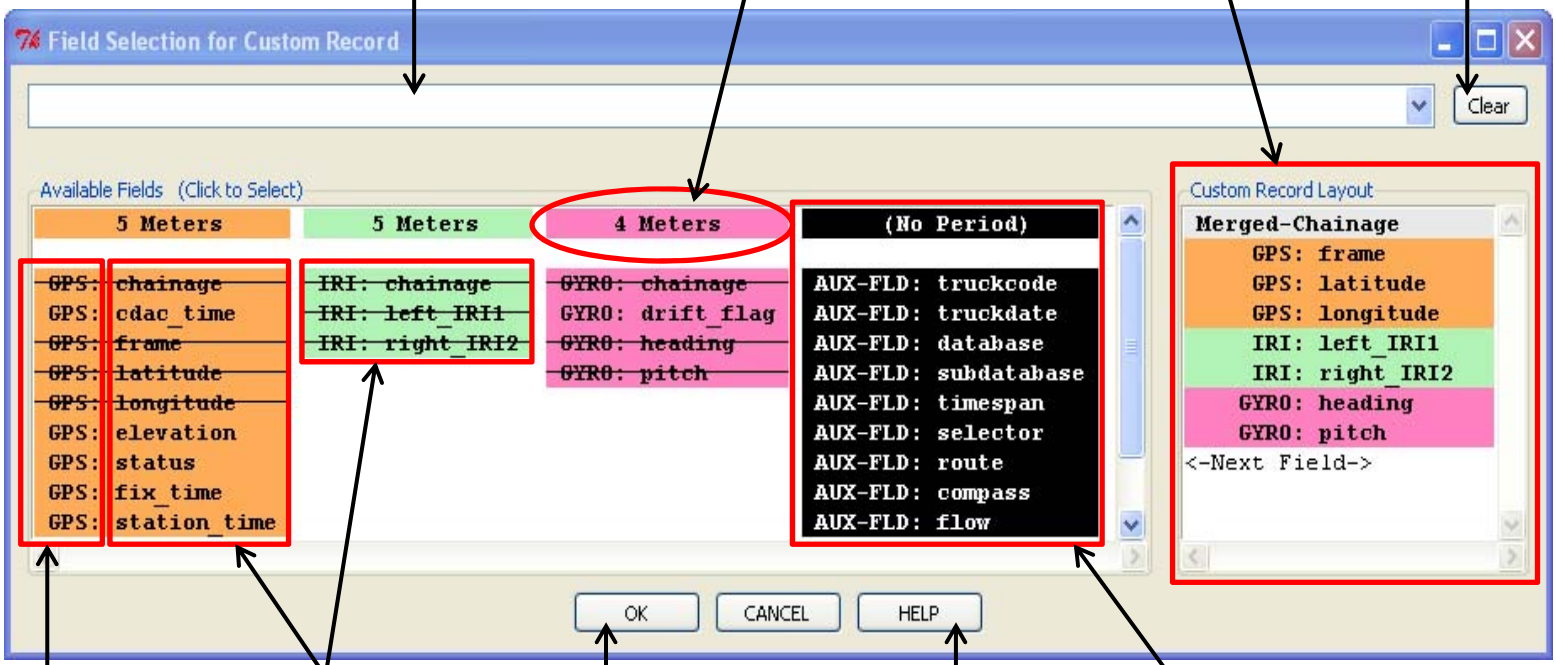
In the image below, the GPS, IRI, and Gyro Data Streams will be selected.
Note: The Chainage data stream, in addition to the chainage itself, also contains data for Elapsed Time and Speed. However, whether you choose the Chainage data stream or not, each of the other data streams contain the chainage information, which, unlike the other subcategories of data within each data stream, cannot be turned off.

Click to select from any available Custom Record Layouts you've already created for a specific combination of Data Streams. The first time you open the Field Selection for Custom Record window, this will be blank, but the next time you return to this window with the same Data Streams selected, the last Custom Record Layout you chose will be displayed here.

Interval at which the data in this Data Stream was collected

Selected Fields and the order they will appear when displayed

Click to clear the current selection



Data Stream name

Available fields within the Data Stream (Selected Fields will have an overstrike bar through them)

Click to confirm the Custom Record Layout and display the data in the Geometric Datastreams window

Click for Help on creating Custom Record Layouts

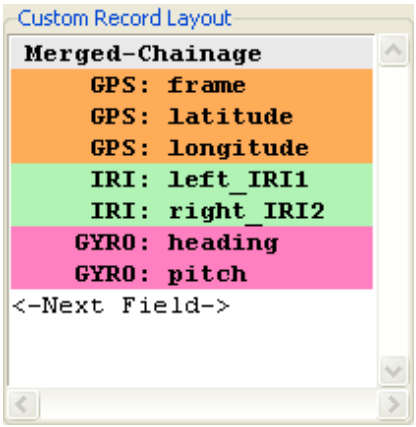
Van information – These do not have to be selected but will appear here regardless of what Data Streams you select for customization.

Editing Your Custom Record Layout

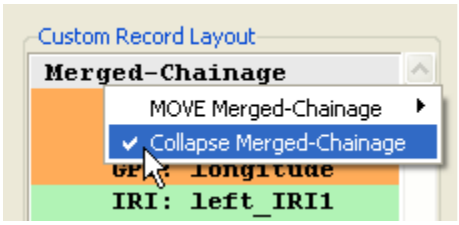
As you click to choose fields from each Data Stream, they will appear in the order you chose them, in the Custom Record Layout Box.
Note: You must select at least one field from each of the Data Streams in order to click the **OK button** and have the data displayed and ready for exporting. The minimum of one field for each Data Stream does not include the chainage field, as those are on by default and cannot be turned off. The truck information data stream (white text over a black background) is the exception and no data fields need to be selected.

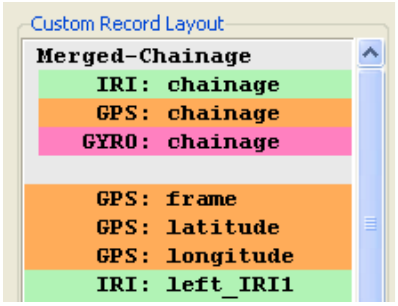
Using the Custom Record Layout controls

In the picture below, there are three unique components: the **Merged-Chainage** at the top of the box, the **<-Next Field->** line at the bottom of the box, and the colored bands of **geometric data fields** that fall in between.



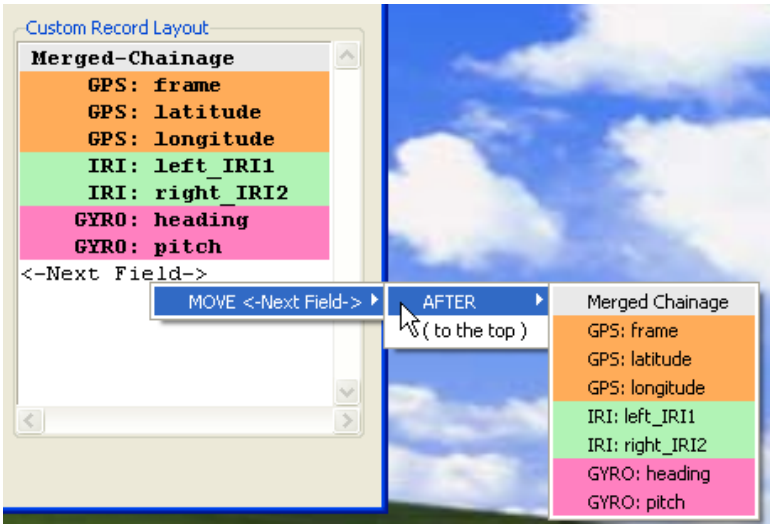
The **Merged-Chainage** field at the top of the box is unique in two ways. The first is that unlike the individual colored bands of geometric data, the Merged-Chainage field is actually comprised of the chainage numbers accompanying each of the Data Streams represented (except for the Van information Data Stream). Below: the picture on the left shows the menu that appears when you click the **Merged-Chainage** Line and pictured right is the expanded Merged-Chainage field.





The second unique aspect of the **Merged-Chainage** field is that unlike the other fields, it cannot be deleted. However, like the **Next Field** and the other data fields, its order in the list can be changed, as described below.

The **Next-Field** Line is different from the other lines in the Custom Record Layout box in that it is not a field, but rather the position in the list where the next selected field will appear. By default, its position will be at the end of the list, but it can be moved to any other position by clicking on it and then by choosing an option from the menu that appears, as pictured below.



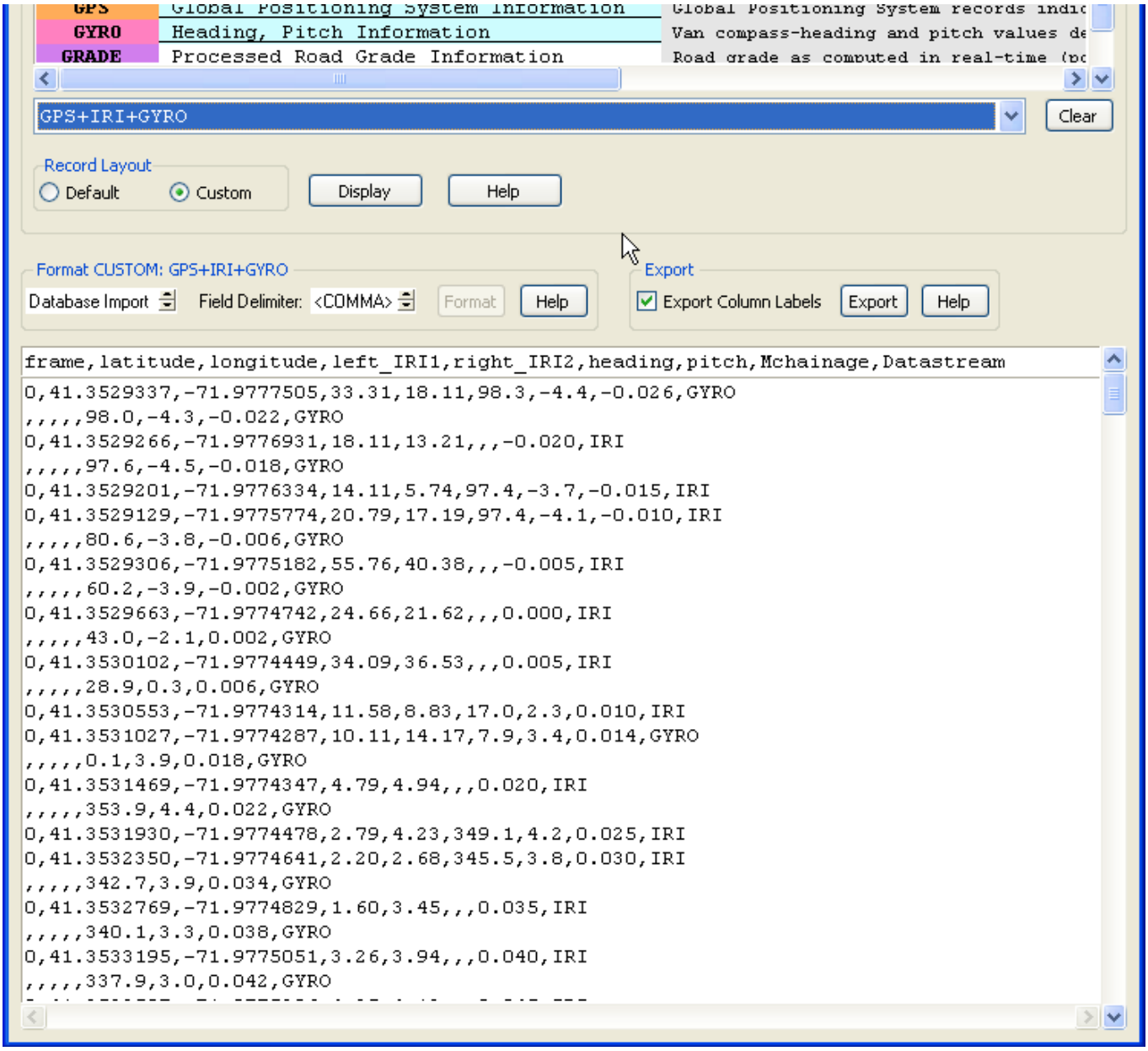
The individual **Geometric Data Fields** can similarly be moved to any position in the Custom Record Layout box, but what makes them unique is that they can be removed from the box (minimum of one field for each Data Stream will still apply). Aside from pushing the **Clear** button which removes everything from the box, these can be removed by clicking on the one you wish to remove and then simply clicking the **Delete** option in the menu that pops up, as pictured below.

Formatting and Exporting Your Data

After arranging the Data Fields in your preferred order, click the **OK button** at the bottom of the window. Your data will now be displayed in that order and, unless otherwise specified, in the default format (Printed Report, Wide columns) in the Data box of the Geometric Datastreams window. At the top of the window, if you haven't done so already, check the **Format/Export** option to make the Formatting and Exporting options available.

If you haven't changed the format prior, you can now do so with a number of options to choose from. As seen on page 50, you may choose between a Printed Report format with either Wide or Compact columns, or you can choose a Database Import format with fields delimited by either Commas, Tabs, or Spaces. After changing any of these options, you must press the **Format button** to redisplay the data in the desired format before you are able to export it.

Geometric data after being formatted in the Comma Delimited Database Import Style

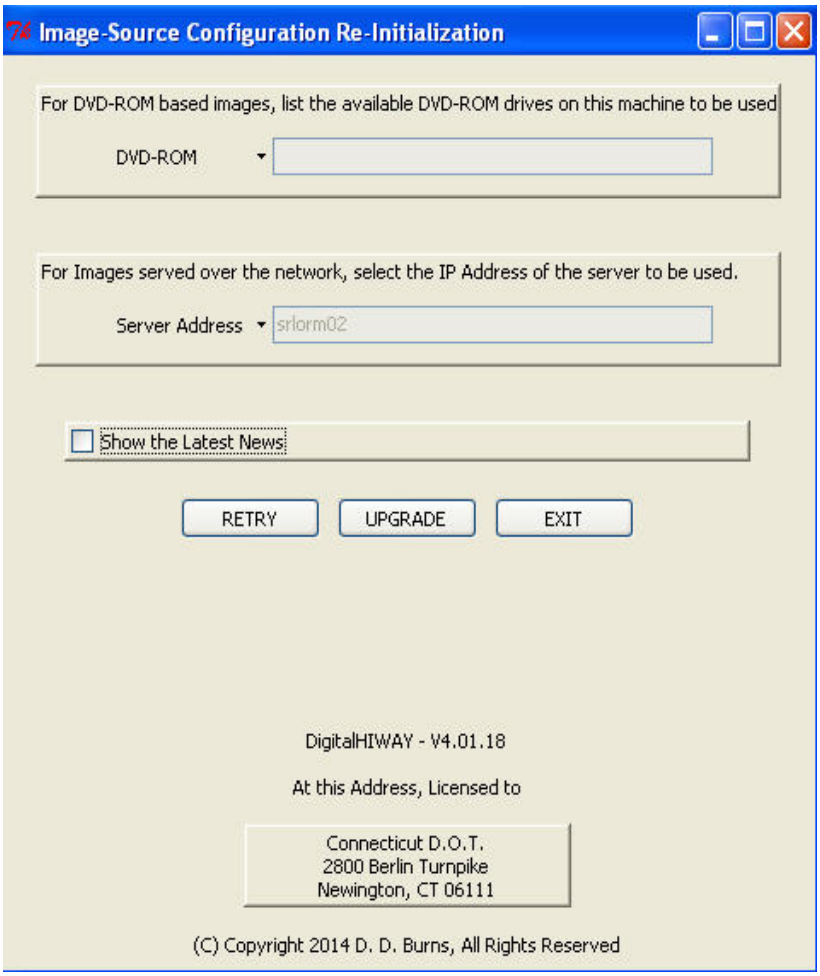


After you've formatted the data to your liking, check or uncheck the **Export Column Labels box** and then press the **Export button**. Unchecking this box simply removes the headers from the exported document.

Upon pushing the **Export button** you will need to locate a place where the output file will be exported to and then name the file with a proper file extension (.txt for example). The click **Save** to complete the export.

Linking to the DigitalHIWAY Image Source(s)

Accessed by clicking the **Configure button** on the **Session Save/Restore window,** the Image-Source Configuration Re-Initialization window, is where you will be able to configure the image source settings, turn the **News** option on or off, and Upgrade DigitalHIWAY when new versions or data have become available.



See the next page for more information on configuring DigitalHIWAY.

To properly configure DigitalHIWAY you must select from one of two media options from which to view images on:

DVD: DVDs are available from the Photolog Office containing years 1999 to the most current year. For each year, there is a "pack" of DVDs. In 2003, for instance, there are twenty-one DVDs. You can only use this method if you have a DVD-ROM drive.

Advantage: You can scan along a route quickly and this allows for a standalone operation with no network connected to the server required.

Disadvantage: You have to change disks when viewing routes from different DVDs.

Server: This is the most commonly used method of viewing Photolog routes. At this time you can access Photolog images from 1985 through the present year by attaching to the server during configuration.

Advantage: Multiple route viewing is seamless.

Disadvantage: Route-image scanning is limited to one frame per second.

If your computer is equipped with a DVD-ROM drive and you are on the ConnDOT network, you may choose both the DVD and Server options. Selecting both options gives you the speed of DVD should you need it, and the flexibility of quickly viewing numerous routes without changing disks.

If you configure for both DVD and network, then you will have to choose which one you'd like to use each time you open a new route:

You will be asked this twice, once for log direction and a second time for reverse direction.

☺ **NEW!** The server setup is preset in the configuration window. If you are on the ConnDOT network you do not have to change the IP Address.

When satisfied with your configuration click on **Continue.** This saves the configuration and starts the DigitalHIWAY Index.

DigitalHIWAY News

This feature of DigitalHIWAY allows the Photolog Services staff to keep users informed of the latest updates and changes to the Photolog software as well as other pertinent information.