MSTA GPS Routing Best Practices for 2022

Norm Kern, January 7, 2022 V10

In general

The starting point for preparing routes for sharing and making them predictable is "Turn all the junk off!." Take control of your routing- do not let a dumb device route for you.

Turn off all avoidances, using standard navigation (not curvy roads), and keep your maps updated. The only way to ensure that a route will go where you want is to use enough points to force it there. The fewer points that you use, the better the chance that the GPS/ phone app will take you where you do **not** want to go.

The routes that we do for MSTA events almost always are loops- riders stay in the event hotel and do day rides. There is almost always a lunch stop, and many riders turn off their GPS units and the route does not always resume after lunch.

I do most routes in two parts. It eliminates the confusion caused by routes that start and end in the same location, and it's always easy to restart after lunch by loading the next (Part 2) route segment. This also reduces the number of points in a given route file. Another benefit of breaking routes into two parts is there is no confusion at the beginning of the route or after lunch looking at the screen and figuring out which way to go.

Check your BaseCamp settings before you start creating a route

(These procedures are all explained thoroughly in the Complete BaseCamp training agenda, which is linked in the Supplementary Materials section at the end of this document**.)**

(Do not connect your GPS to your computer yet.)

1. Set options in BaseCamp Toolbar: Right click on the toolbar and check all except Playback, Playback Info, Task Launcher, and Area Avoidances. Next, set these options in the toolbar: Activity Profile = Motorcycling, Select Map Product = City Navigator North America NT 2021.10 (or the most recent version)

2. Map Detail = Highest.

3. Set the following options in the menu: Edit>Options>Activity Profile = Motorcycling

4. Change the preferences and avoidances for the Motorcycle activity profile. In general, it is better to shut all avoidances off and not rely on avoidances to draw your route. It is better to add enough via points to force the route where you want to go. Go to the BaseCamp menu and select these choices:

   1. Edit>Options>Activity Profile>Routing>Route Preferences = Faster Time.

2. Edit>Options>Activity Profile>Routing>Road Type Avoidances = All Unchecked

3. Edit>Options>Activity Profile>Routing>Feature Type Avoidances = All Unchecked

4. Edit>Options>Activity Profile>Routing>Area Avoidances = Unchecked

5. Edit>Options>Activity Profile>General>Map Display Features>Select. Expand Points by selecting the + icon. Expand Transportation by selecting the + icon. Uncheck Air Transportation so your map is not cluttered with airport icons (You can uncheck other items if desired).

This may change some of your older routes that were created using the motorcycle activity profile. If in doubt, backup BaseCamp and all your routes by going to File>Backup. Another good practice is to always create a track from the route before recalculating it. That makes it easy to check to see if anything changes when you recalculate an old route using the modified activities profile.

About Route points

Before we start creating a route, it is important to understand the difference between the three types of Route points.

Way point- A location point that can be used in a route that **also exists independently of the route**. When used in a route, Way points always alert, both in instructions and voice prompts. (When a route is imported on the GPS, Way points that are used in the route are added to Favorites/Saved Places on the device when the route is imported.)

Via point- A location point that **alerts** but **exists only within a route**. (Via points are **NOT** added to Favorites/Saved Places on the device.)

Shaping point- A location point that **does NOT alert** and **exists only within a route**. Shaping points are very useful in routes for newer GPS models but are not always recognized by older GPS models. Via points can be selected in the Route Dialog Window and converted to shaping points and vice versa.

Norm's Standard routing procedure - Part 1 Start to Lunch

Creates a Standard version of the route that is suitable for older GPS models- zumo 450, 550 660, etc. Watch video at
https://www.youtube.com/watch?v=oh5HSTvSJb4&t=914s

1. In Basecamp create a new List which will contain the Tracks, Way points and Route segments for your route. Name the new list with your intended Route Name. I use the format *xx NAME Vyy zzz*, where *xx* is a number that lets event attendees refer to rotes by number to simplify requests for downloading routes, a descriptive *NAME*, *Vyy* is an optional Version number, and *zzz* is the total mileage that will be added to the name later.

2. Create a Way point located half to one block from the event hotel in the direction the route is going. I name it with a two letter code for the event, followed by "Start" followed by a direction relative to the host hotel. For FlyBy Week I use *FBStart E* and *FBStart W*, depending on which direction the route goes from the hotel. I use the same two start points for all my FlyBy Week routes

We will create routes in at least two parts- Start to Lunch and Lunch to Finish.

3. Use the New Route tool to start a new route and select the starting Way point you previously created to begin the route.

4. Create plenty of Via points to force the route to follow the intended roads.

Important Tip: When positioning the Insert tool for each Via point, let it "settle" for a few seconds. A tag will appear next to the pointer indicating what is being selected. Ideally you want a road address, but you will often get an intersection or point of business. Zoom in on the map by hitting the + key for better control. If you settle and wait for the tag before clicking, your route points will be centered on the road. Otherwise you will have lots of Via points to clean up and reposition later.

5. Create a "MILES" Via point every 30 to 40 miles by selecting an existing Via point at the appropriate distance and renaming it with the *mmm MILES Rxx* naming convention so it can be used as a reference by riders. When the voice prompt announces it, it tells the rider how far into the route they are. (*mmm* in the Via point name is the number of miles into the route and *Rxx* is a reference to the particular route to make the Via name unique, as Basecamp does not permit identical point, route or track names in its database. For example I would use R05 to refer to any named points for Route 05 in my event.)

6. Create a Way point for a Gas Stop/Break about every 75 miles or less. Name them *mmm MILES GAS STOP Rxx* so they announce and inform riders of the gas availability and how far they are into the route. You can add the name or the brand of the station if you wish.

7. Optional- you can include the distance to the next gas stop on the route in your gas stop name. (30 characters max) e.g. *75 MILES GAS NEXT GAS 35 MILES*

8. Select a Via point about half way between each Gas Stop/Break and rename it to a "MILES" point.

9. Finish the route with a Way point at the lunch location. Name of the Way point is typically the name of the restaurant.

10. Set a start time of 9am for the route. (Or earlier if the day's route is very long.) Double click the Start Way point in the Route Dialog Window to open the details window for the Way point.

11. Set a 15 minute layover time for each Gas Stop/Break.

12. Rename the route by copying the name of the route list it is in and adding Pt1 and its mileage to it.

Norm's Standard routing procedure - Part 2 Lunch to Finish
 Watch video at: https://www.youtube.com/watch?v=20pNuU88_u4&t=3s

1. Create and insert a starting Way point for second part of the route half to one block from the lunch location in the direction the route is going. Since it is a conventional Way point that exists outside the route, it will need to be a unique name, but I like to include *PT2 START* in the name for clarity.

2. Use the New Route tool to start the route. Do **NOT** use the lunch stop Way point for the start of the second part of the route, but use the one you created in Step 1 above.

3. Repeat steps 3-8 in Part 1 above for Part 2 of the route.

4. Use the event hotel Way point as the finish destination for the afternoon route and include the word *Finish* in the name, e.g. *FB Finish*.

5. Allow 1:00 hours (or whatever you prefer) for lunch and set the appropriate start time for the second part of the route.

6. Set a 15 minute layover time for each Gas Stop/Break.

7. Riders usually set their trip odometers on their bike and GPS to zero at the beginning of the day, but don't reset after lunch for the second part of the route. Therefore, I add the total miles from Part 1 of the route to each "MILES" Route point including Gas Stop/Breaks.

Check and finish the routes
Repeat these steps for both Part 1 and Part 2,

1. Create a fresh track from the route to use as a reference. Select bright green for the color.

2. Double click the route to open the Route Dialog Window and position it in the lower left corner of the screen.

3. Make sure the Center Map option in the lower left corner of the Route Dialog Window is checked.

4. Single click the starting Way point in the list of Route points. It will appear centered on the map panel at maximum magnification.

5. Use the Move tool if needed to precisely position the point on the road.

6. Click the next Route point to view on the map and reposition if necessary.

7. Some Route points will be at intersections. Move them away from the intersection.

8. If a Route point is near a turn, make sure it is AFTER the turn.

9. Some Route points will have the names of businesses and possibly some sort of icon other than a point. In this case, use the Insert tool to create a generic Route point nearby. (easy when zoomed in) Route points that have a business or other distracting name but no icon can simply be renamed by double clicking them in the Route point list.

Route point names must be unique within the Basecamp database unless they are a duplicate of a point used in other routes. If you get an "Invalid Input" warning, simply add a 1 or some other character to the end of the point name.

10. When you are done with Step 5-9 on all the Route points, you may have noticed that BaseCamp set some of the Route points to "(won't alert)" or Shaping point status. This will cause some points to be skipped by older GPS units, so convert all Route points to Via points. The Start and Finish points are special and have automatic alert status, so click on the second Route point in the Route Dialog Window. Scroll down to the next to last Route point and <shift> click it. All Route points except the first and last will be selected. Right-click anywhere in the selected points area to open the quick menu. Click "Alert on arrival" to set all selected points to alerting Via points. Wait a few seconds for the operation to complete. All points in the route are now either Way or Via points.

11. When you are satisfied with the route, recalculate it one more time and compare with the track. If all is well, delete the reference track and create a new one. Make the newly created reference track bright green. (Recreating the track gets rid of small errors that were caused by Route points that were not precisely positioned, etc.)

Name the Standard routes

If your rally has multiple routes available, I suggest this naming convention:

NN Name Pt# MMM VV where *NN* is a sequential number for the rally's routes. Numbering allows riders to ask for routes by number rather than remembering names. *Name* is a description such as "BVLunch," *Pt#* designates Part 1, 2, etc. *MMM* is the length of the route in miles, and *VV* is an optional version ID such as TP for the "Trip Planner" version we will create next.

About Trip Planner "TP" routes

The zumo XT, 590 and 390 series, BMW Nav 5 & Nav 6 and some new Nuvis use a routing app called Trip Planner which requires modified routes to work properly.

The Standard route we first created uses Way points and Via points, both of which alert when encountered during navigation of the route. Trip Planner GPS models are limited to a maximum of 29 Way and Via points per route. When imported on Trip Planner GPS models, routes with more than 29 Way and Via points are split into multiple routes. Even worse, if you get off route or otherwise miss a Way or Via point, these GPS models will force you to go back to any Way or Via points you missed unless you manually Skip them. It's unworkable.

The solution to the problem is to convert all Route points **except** Start, Finish, *mmm MILES*, *mmm MILES GAS,* and *m.m MILES AFTER GAS* points to Shaping points by selecting them in the Route Dialog Window, right clicking to open the quick menu and left clicking "Don't alert on arrival.(Shaping point)" This converts the selected points to shaping points, which force the route to follow the specific roads but don't alert and don't force you to go back if you miss one or more of them. A TP version route with over 100 points works fine as long as 30 or less are Way or Via points and the rest are Shaping points.

Why not simply use the TP route version on older non-TP GPS models? Those models only recognize some of the shaping points, dropping others. Not recommended. (Shaping points in routes on older models that are recognized still produce alerts, so there's no benefit there either.)

BTW Older zumo models can handle up to about 100 Way and Via points per route. Only low end Nuvis have problems with lots of Route points, so using more points improves reliability for both old and new GPS models.

Important additional TP point placement strategies

1. Getting a route started- On Trip Planner model GPS units, the start of a route always defaults to the second alerting point on the route. Many route users don't pay attention to this, so I start each route with **two** alerting points- the first is a Way point 1-2 blocks from the event hotel in the direction the route is headed. The second alerting point is a Via point located a quarter of a mile to a couple of miles further on a part of the route that cannot be skipped. That way, whether the rider uses the default (second alerting point) or the physical first Way point makes no difference.

2. For TP routes, Gas Stop/Break Way points **must** be placed in the middle of the road just before the physical location of the gas stop to force riders to pass over them so they are not skipped.

Likewise there needs to be an additional alerting Via point after them that makes it easy to Skip the Gas Stop/Break Via point if the rider misses it.

The Finish point of each route segment is not critical to pass through since it's at the end of the route. Part 2 of the route repeats the two alerting Route point starting convention to get riders started on the right foot again.

How to create a Trip Planner (TP) version of a Standard route
Watch video at: https://www.youtube.com/watch?v=IPQMDlMvZg0&t=12s

1. Duplicate the Standard version of each part of the route.

2. Rename the duplicates to the same as Standard version, and adding the TP suffix.

For each of Part 1 and 2 of the route

3. Find a Via point 1-2 miles into the route in a location that can't be skipped and name it *m.m MILES START 2*, where *m.m* is the distance in miles from the start

of the route, e.g. *1.8 MILES START 2.* Use all caps to make the point easy to spot in the route point list.

4. Make sure all Gas Stop/Break points are positioned in the middle of the road just before the Gas Stop/Break

5 Option- If the physical location of a Gas Stop/Break is significantly off the main road, you can skip Step 9 and do the following:

> 1. Create a new Via point ON the road just before the Gas Stop.

> 2. Double click on the original Gas Stop Via point and copy its name, then rename it to the original name of the gas station etc.

> 3. Paste the Gas Stop name you copied into the name of the Via point you just created.

6. Insert an additional Via point 1-2 miles after each Gas Stop/Break and name it *m.m MILES AFTER GAS*, where *m.m* is the distance in miles from the Gas stop, e.g. *1.8 MILES AFTER GAS*

Convert Via points to Shaping points

7. Double click the TP route to open the Route Dialog Window.

8. Scroll down to the next to last point on the route and click it.

9. Scroll up to the start of the route.

10. <shift>click the **third** point on the route. This selects all Route points from the third to next to last. They will be tinted light blue.

11. Position the mouse over one of the light blue tinted Route points. Right click for quick menu and then left click the "Don't alert on arrival" item. Wait a few seconds for the operation to complete. All the selected Route points will have "(won't alert)" after their name.

12. Go to the top of the Route point list. Scroll down the list. Click each *mmm MILES*, *mmm MILES GAS,* or *m.m MILES AFTER GAS* point you encounter to select it. Right click to open the quick menu and left click on "Alert on arrival" Repeat until you get to the end of the list. Both route versions are now complete.

12. Final step- Update the name of the List holding the routes finished routes by adding up the total mileage of all the parts and adding that number to the end of the list name. For example: *02 BridgeRide 315*

Export the routes to GPX files for distribution
Watch video at: https://www.youtube.com/watch?v=UsQWtIqlr1E

Finished routes need to be exported to GPX files on the computer for upload to the web and transfer to GPS units.

1. Click the *02 BridgeRide 315* List item in the Basecamp Library

2. Click the File drop-down menu item near the upper left corner of the BaseCamp screen

3. Click the *Export* option. A submenu will appear.

4. There are two options- *Export '02 BridgeRide 315'*... which exports the entire contents of the List, and *Export Selection* which exports whatever items are selected in the Details Window in the lower left corner. We want the entire List, so click *Export '02 BridgeRide 315'*...

5. In the File Dialog Window choose the drive and folder location for the GPX file. The file name defaults to the name of the List, which is fine.

6. Click Save to complete the operation.

    7. Done!

Now that we have the routes, here is how to set up the various GPS models for best results:
Watch video at: https://www.youtube.com/watch?v=QmA8dmbKMfU&t=64s

a) Zumo XT, 590 and 390 series, BMW Nav 5 & Nav 6

- Settings>Calculation Mode>Faster Time> Save

- Settings>Navigation>Avoidances>Disabled (all boxes unchecked) > Save

- Tap Vehicle Icon in upper left of main screen>Motorcycle>Save

- Settings>Map & Vehicle>Map Detail>More>Save

b) Zumo 660 series, BMW Nav 4

- Tools>Settings>Navigation>Avoidances. (Disabled) Uncheck everything, especially seasonal closures and unpaved roads.

- Tools>Settings>Navigation> Route Preferences = Faster Time

- Tools>Settings>System>Usage Mode = Motorcycle.

- Tools>Settings>Map>Map Detail = High.

c) Zumo 550/450

- Tools (wrench icon)>Navigation>Avoidances>Disabled (all boxes unchecked). Especially Unpaved Roads and Ferries.

- Tools (wrench icon)>Navigation>Route Preferences = Faster Time

- Tools (wrench icon)>Map>Map Detail = Most

All above models- Off-Route Recalculation Mode

These improved routing techniques make routes much more reliable, so the best choice depends on what you do when you miss a turn or otherwise get off route.

If Off-Route Recalculation is set OFF, you can look at the screen and see you are no longer on the route. Simply zoom out and see where you need to go to most easily get back to the route.

If Off-Route Recalculation is set ON, the GPS will recalculate and autoroute you back to the next Via or shaping point on the route. Unless you have loaded the track for your route and made it visible you will no longer know how the route was intended to go.

Reminder for all GPS models:

Avoidances- Disable all- Very important, as avoidances can prevent correct calculation of routes on the device.

Map detail- More/High/Most- Very important, as route calculation only uses roads visible on the map. You want all roads to be visible.

Transferring GPX file(s) to a GPS
Watch video at: https://www.youtube.com/watch?v=QjzkuD73AMk&t=10s

Best practice: Using File Manager on the computer, simply copy the desired GPX files directly to the GPX folder of the GPS internal memory directly.
Step by step:

1. Connect the GPS to your computer using an appropriate USB cable.

2. Once the GPS is recognized, double click on Internal Storage.

3. When you see the GPX folder, double click on it to enter.

4. Drag and drop the GPX files you wish to transfer from the computer to the GPX folder.

5. When done, disconnect the GPS from the computer. (Since the Garmin GPS is recognized by the computer as a device rather than an external drive, there is no need to Eject it before disconnecting.)

There are two other methods for transferring GPX files to a GPS unit that I DO NOT recommend.

The first is from the Basecamp List directly, using BaseCamp itself, and selecting the GPS internal memory as the destination. Routes will automatically import when the GPS is disconnected from the USB connection and the device is turned on. Quick and simple, but there is a risk. Since there is no copy of the raw GPX file, if the route becomes corrupted, you cannot re-import it. Not recommended.

The second is doing the same as above, but to an SD memory card installed in the GPS. Routes transferred this way are not automatically imported and the GPX file is stored intact on the card. Unfortunately BaseCamp renames the GPX files with generic names, which makes figuring out which GPX files to delete later when no longer needed very difficult. Not recommended either.

IMHO, GPX files are small and take up very little internal memory, so there is nothing to be gained by using an SD card. For those who wish to do so, Ed Conde has a safe methodology for using the SD card that he discusses in a later section.

Import routes on the GPS

Once GPX files are stored on the GPS, routes (and optionally tracks) must be imported before they can be used.

1. Power On the GPS and give it time to boot up.

2. When the GPS is booted up, most will discover the new routes and offer to import them. Select Yes. Be sure to choose routes with the TP suffix if you have a zumo 390 series, 590, 595 XT, BMW Nav5 or Nav6. For older models, import the Standard version routes.

3. The GPS will import and calculate them using the map database on the device and routing settings we selected above.

Option: Using tracks as a reference with routes

1. Garmin zumo 660 and Trip Planner models with a Tracks app can display tracks on the screen in various colors as a reference and backup to your routes. If you want use tracks for your routes, you may have to import them separately, using the Tracks App, (or My Data on the zumo 660) Select Import and choose the matching tracks for the routes you imported.

2. When you want to use a particular track, select it in the Tracks app and mark it visible on the map. Check the color and change it if you wish. Bright green works best for me.

3. The Track will then display as a green line on the map. When you load the matching route, the magenta route line will load on top of the track and hide it.

4. If the calculated route deviates from the track, the green line becomes visible. When this happens, follow the green line, which is the intended route. The two lines will converge back together at or before the next route point.

Setting up your GPS & BaseCamp
You will need your fully charged GPS, your USB cable, and a laptop with power cord. You should familiarize yourself with Garmin BaseCamp by reviewing the videos on Introduction, Installing, Organize & Filter, Routes, Find and Transfer by clicking on *https://www.garmin.com/en-US/learning-center/basecamp-pc* for pc or *https://www.garmin.com/en-US/learning-center/basecamp-mac* for mac.

If you are, feeling inspired, you can also look over the Owner's Manuals and the BaseCamp Help files accessible from the BaseCamp Menu Bar or by clicking on *https://support.garmin.com/en-US/?productID=52801&tab=topics*

Here are the links for **downloading both BaseCamp for routing and Garmin Express** for updating maps and Garmin Express firmware.

BaseCamp: *https://download.garmin.com/software/BaseCamp_474.exe*

Garmin Express: *https://download.garmin.com/omt/express/GarminExpress.exe*

Complete BaseCamp training agenda from Ed Conde of New England Riders- This is the best guide to install, set up and use Garmin BaseCamp to create routes.
For PC: *https://www.newenglandriders.org/download/basecamp-tutorial-for-pc-part-1/*

https://www.newenglandriders.org/download/basecamp-tutorial-for-pc-part-1-advanced-routing/

For Mac: https://www.newenglandriders.org/download/basecamp-tutorial-for-mac-part-1/

https://www.newenglandriders.org/download/basecamp-tutorial-for-mac-part-2-advanced-routing/

Work through these tutorials so you can understand and do the MSTA-specific procedures in the main article above.

A few other topics of interest

SD Card vs Internal Memory

I recommend that you buy an SD card (memory card) for your GPS and upload routes to it instead of to the GPS internal memory. If your route becomes corrupted while on the road, you can download it again from the SD card. An SD card may also be handy for exchanging routes with friends on the road. Create a folder labeled "Garmin" and a subfolder labeled "GPX" on the card (some GPS's create these folders automatically.) These folders will contain the routes sent from BaseCamp.

Keeping most routes on the SD card also allows you to upload routes only when you actually need them. This keeps internal memory clear which can be important for 660s and 550s with limited memory.

For an important ride or trip, I tend to keep routes on the SD card and internal memory.
If you have trouble uploading rides from your SD card to internal memory, I suggest that you try to fix the problem by calling Garmin and/or using online research. Here is the fix if your zumo 396 SD Card has trouble communicating with Garmin Express: *https://support.garmin.com/en-US/?faq=wRNPwojx3GAFk14dYkVnF9*

Remove vs. Delete
In BaseCamp, there is a huge difference between "Remove" and "Delete."

"Remove" removes a route/Way point, track, etc. from a folder. These items remain in BaseCamp in another folder or in the Unlisted Data folder.

"Delete" permanently deletes the item from BaseCamp. It will be gone for good. Use "delete" with caution.

Best practice: Only Delete from Unlisted.

Loading MAPS into BaseCamp

A number of folks have problems with this so I will repeat map loading into BaseCamp here. Look at the attached photos.

With your GPS connected, start Garmin Express.

Choose your GPS (an update window will open)
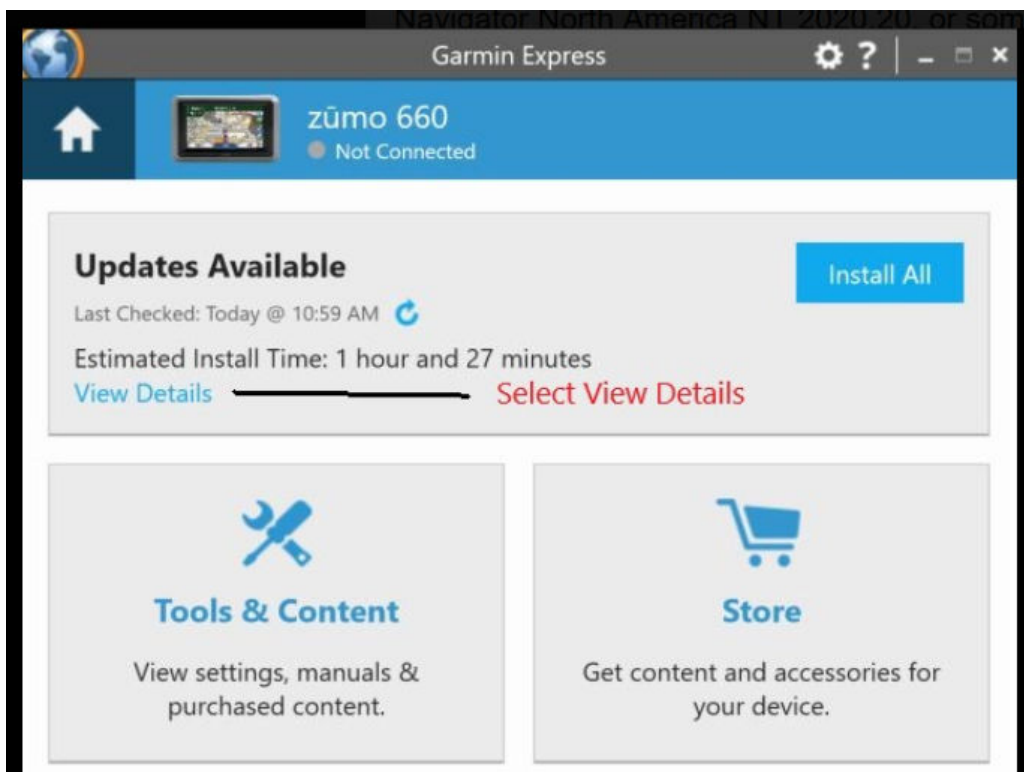
Select View Details (updates will show)

For the U.S. and Canada map, select Installation Options

Select *Device only* (your GPS) if you already have the detailed map in BaseCamp

Select *Computer and Device* if you are updating the map on your GPS and in BaseCamp.

Select *Computer Only* if you already have the latest map on your GPS, but not in BaseCamp.

If you do not have a detailed map loaded to BaseCamp, your map will show as Global Map, which only has major highways. You can not route with a Global Map. Make sure that you have the detailed map loaded to your device and to BaseCamp. To check, disconnect your GPS and ensure that you have City Navigator North America NT 2020.20, or something similar, listed in your BaseCamp Map products drop down window.

Garmin Express ⚙ ? — ☐ ✕

3

zūmo 660

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Add a Device

Select your GPS

Garmin Express ⚙ ? — ☐ ✕

🏠 zūmo 660
● Not Connected

Updates Available

Install All

Last Checked: Today @ 10:59 AM ⟳

Estimated Install Time: 1 hour and 27 minutes

View Details ——————————— Select View Details

Tools & Content

View settings, manuals &
purchased content.

Store

Get content and accessories for
your device.

Garmin Express ⚙ ? _ ▢ ✕

🏠 **zūmo 660**
⬤ Not Connected

◀

3 Updates Available

Install All

US & Canada

Install

Version: 2020.30
File Size: 3.85 GB
Installation Time: 1 hour and 27 minutes

• Updates map data.

Installation Options ⊙ ———————— Select Installation Options

To use maps with Garmin BaseCamp™, you can install the files on your computer in addition to your device.

Installing files on the computer may take a significant amount of hard drive space. When you choose to install files to your computer, you will be installing Garmin BaseCamp in addition to map updates.

Learn About BaseCamp ↗

Select where you would like to install the files.

⦿ Device Only ———————————————— Select Device only
○ Computer and Device
○ Computer Only