Understanding ClimbPro on the Edge

(Updated for the May 2020 software release)

What is ClimbPro?

ClimbPro is a feature on the Edge that will identify and classify climbs based on the needs of cyclists whilst they are navigating. It will provide the rider with key information about those climbs.

This includes:

- the number of climbs
- the distance to the next climb
- the length of each climb
- the elevation gain left to go on a climb
- the average grade of the remainder of a climb
- An estimation of the time left to reach the top of the current climb (New in the March 2020 release)

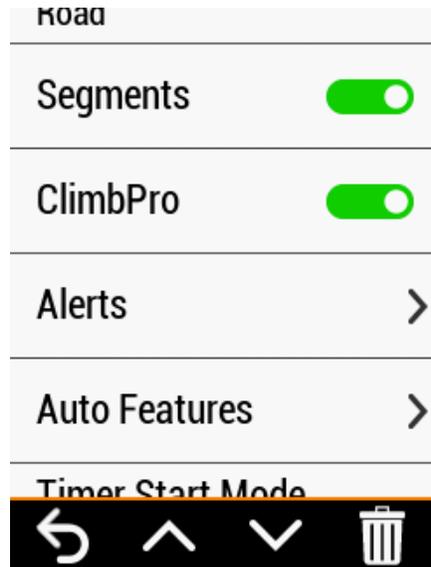## What navigation options are supported by ClimbPro?

- Following a course that has been loaded on the Edge
- Roundtrip routing
- Navigation to a specified destination

How do I switch ClimbPro on/off?

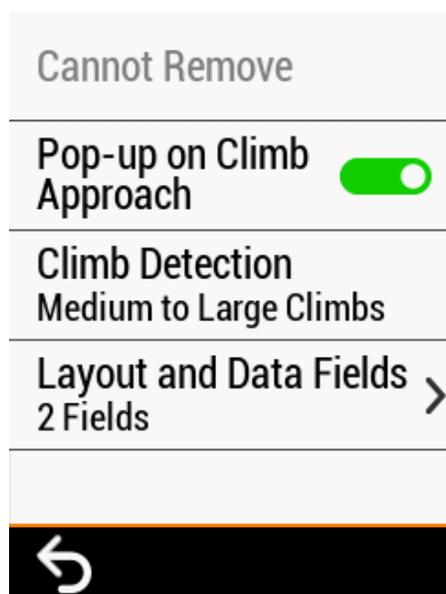By default, ClimbPro is enabled.

Control of the whole feature is under each activity profile.

Activity Profile -> <your profile>

Separately when ClimbPro is enabled you can control if you are taken to the ClimbPro page when a climb starts.

The control of this feature is on a per activity profile bases and is located under the Activity Profile -> <your profile> -> Data Screens -> ClimbPro -> Pop-up Climb Approach
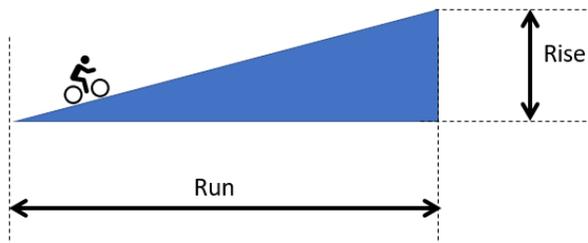
First a quick primary on grade or slope

The grade value is a critical part of how ClimbPro selects climbs so it is usefully to make sure that the concept is understood.

ClimbPro uses grade as a % in its calculations.

Garde or slope is the rise (gain in elevation) over the horizontal distance travelled (the run).

$$Grade\ (\%) = (Rise/Run) \times 100$$

How does ClimbPro identify the climbs it will report?

ClimbPro will identify and report climbs at two different levels. ClimbPro users a scoring system to select the climbs.

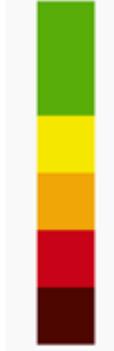**Climb Score = length of the climb(meters) x grade(percent)**

ClimbPro then uses the climb score to select and classify climbs.

At the macro level ClimbPro will identify categorized climbs on the Elevation page when navigating or on the Elevation page when previewing a course.

In professional road cycling the process for categorizing climbs is subjective and is controlled by the race organizers who will take into consideration what the riders have already climbed when categorizing each climb. ClimbPro use an objective measure and treats each hill in isolation using the following climb score values:

- Cat 4 > 8000
- Cat 3 > 16000
- Cat 2 > 32000
- Cat 1 > 48000
- HC (Hors Category) > 64000

Categorized climbs are identified on the elevation page using the following colors.

Elevation Page	
Category	Color
None (< Cat. 4)	Green (Default color)
Cat. 4	Green
Cat. 3	Yellow/Gold
Cat. 2	Orange
Cat. 1	Red
HC	Dark Red

In addition to identifying the categorized climbs on the elevation page ClimbPro also identifies climbs at the micro level. These climbs are reported in a list and can be individually previewed when reviewing the course and will be reported in a new training page when you are following the course or navigating.
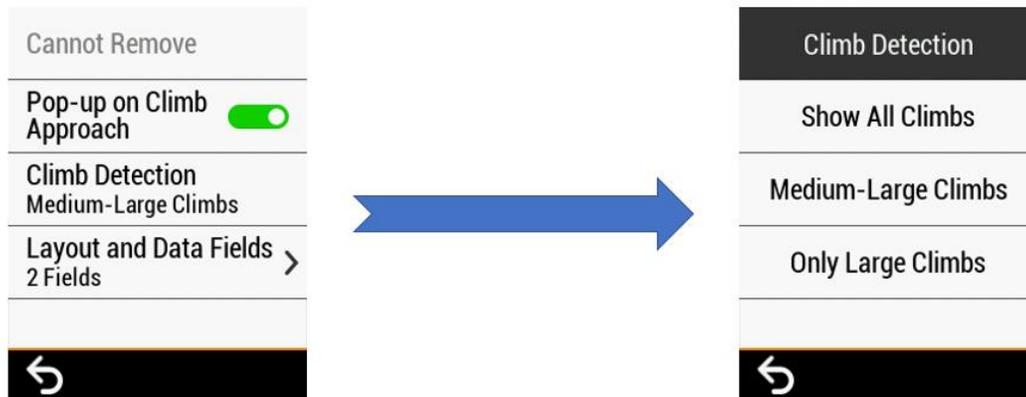
The rules for considering a climb are listed below. All rules must be satisfied.

1. At least 500 meters in length
2. Average grade of 3% or more
3. Must exceed the selected Climb Score (see below for details)

The Edge 530/830/1030 have the ability for the user to adjust the climb score value used (threshold).

Under the ClimbPro page settings is an option that allows you to select different Climb Score values.

The medium option is the default and maps to what the Edge was doing before this control option was added.

Show All Climbs with a Climb Score Value greater or equal to 1,500

Medium-Large Climbs >= 3,500 (Default value)

Only Large Climbs >= 8,000 (This is the Cat4 threshold used by ClimbPro.)

Here are some examples to illustrate the rules using the default climb detection of "Medium – Large Climbs". E.g. A Climb Score of **3,500**

a. 700 meters in length with an average grade 3%. NOT a climb (Rule 3), Climb Score not reached
   Climb Score = 700 x 3 = 2,100
b. 1.5 kilometers in length with an average grade 3%. Is a climb.
   Climb Score = 1,500 x 3 = 4,500
c. 500 meters in length with an average grade 7%. Is a climb.
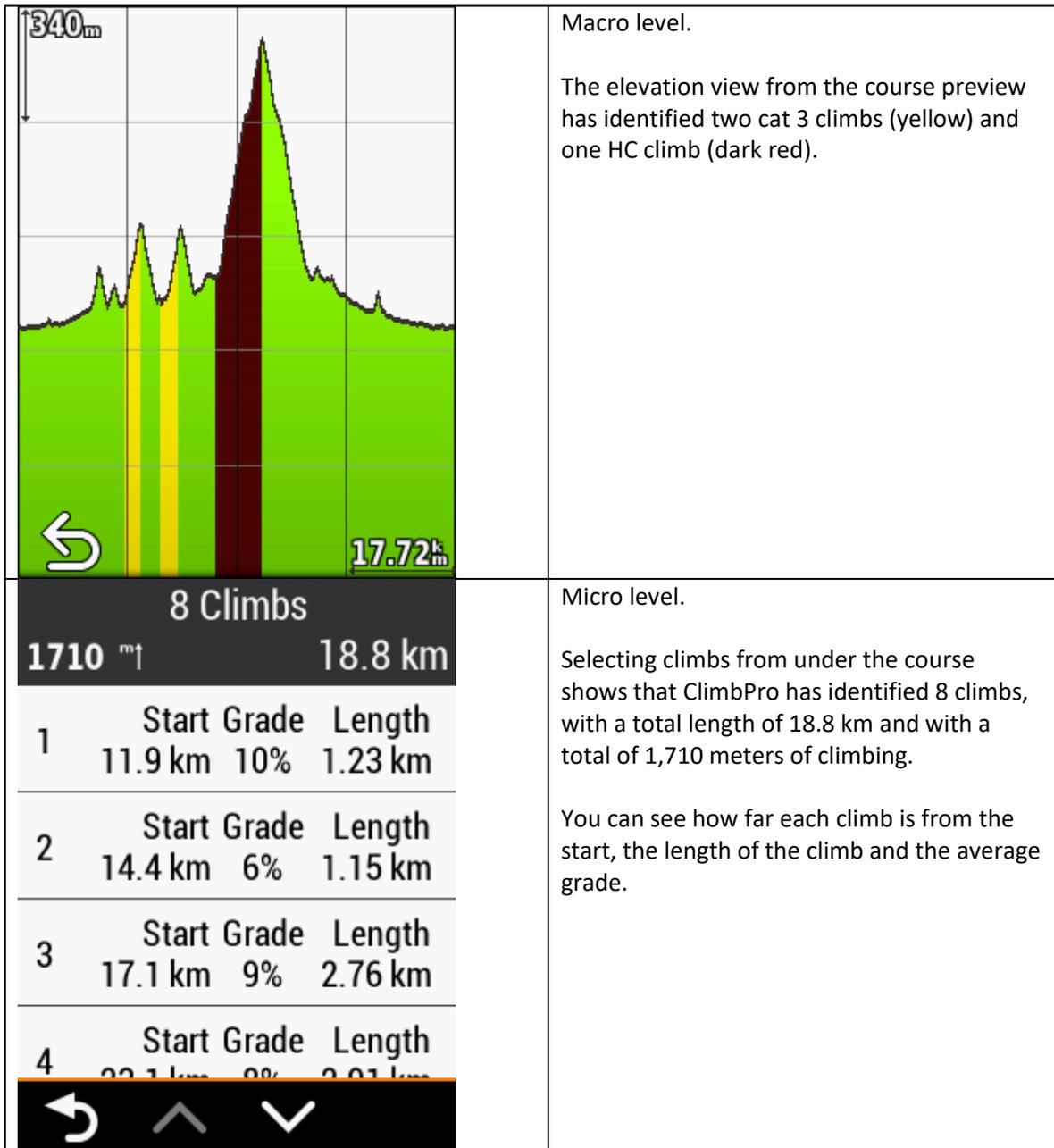   Climb Score = 500 X 7 = 3,500

d. 500 meters in length with average grade 6%. NOT a climb (Rule 3), Climb Score not reached

Climb Score = 500 X 6 = 3,000

e. 450 meters in length with average grade 15%. NOT a climb (Rule 1), too short
f. Total climb 20 kilometers in length, first 5 km with average grade 6% and the rest (15km) with an average grade of 1.5% NOT a climb (Rule 2). Note ClimbPro will identify a shorter climb, but not the full 20km climb.

This algorithm does not guarantee that the summit of a climb will be included in a climb if it flattens out near the top, consider example[f].

When on the ClimbPro page the profile is broken down into sections for the grade and uses the following coloring.

ClimbPro Page	Elevation Page		
Grade Zone	Category	Color	
<0%	None (< Cat. 4)	Green (Default color)	
0~3%	Cat. 4	Green	
3~6%	Cat. 3	Yellow/Gold	
6~9%	Cat. 2	Orange	
9~12%	Cat. 1	Red	
>12%	HC	Dark Red	

Here is a sample course.

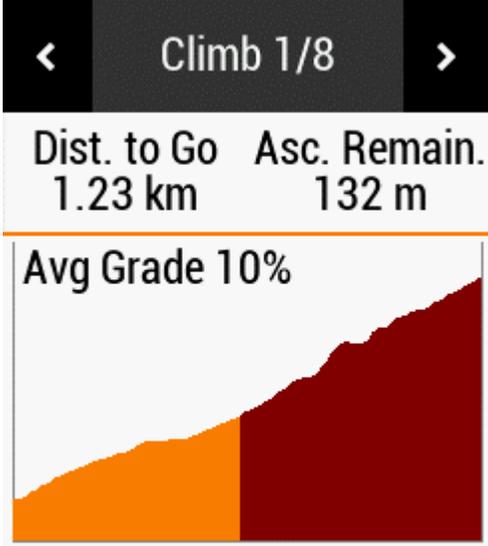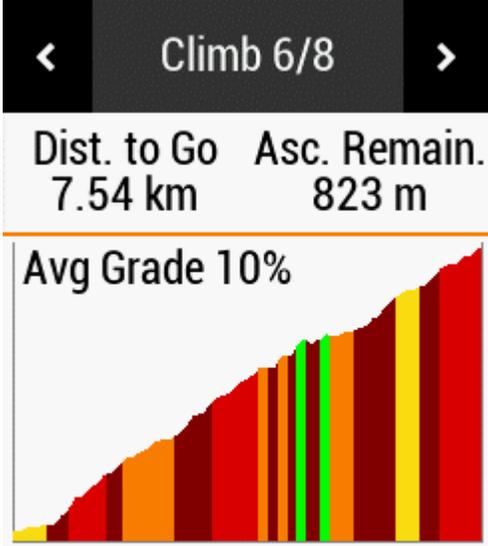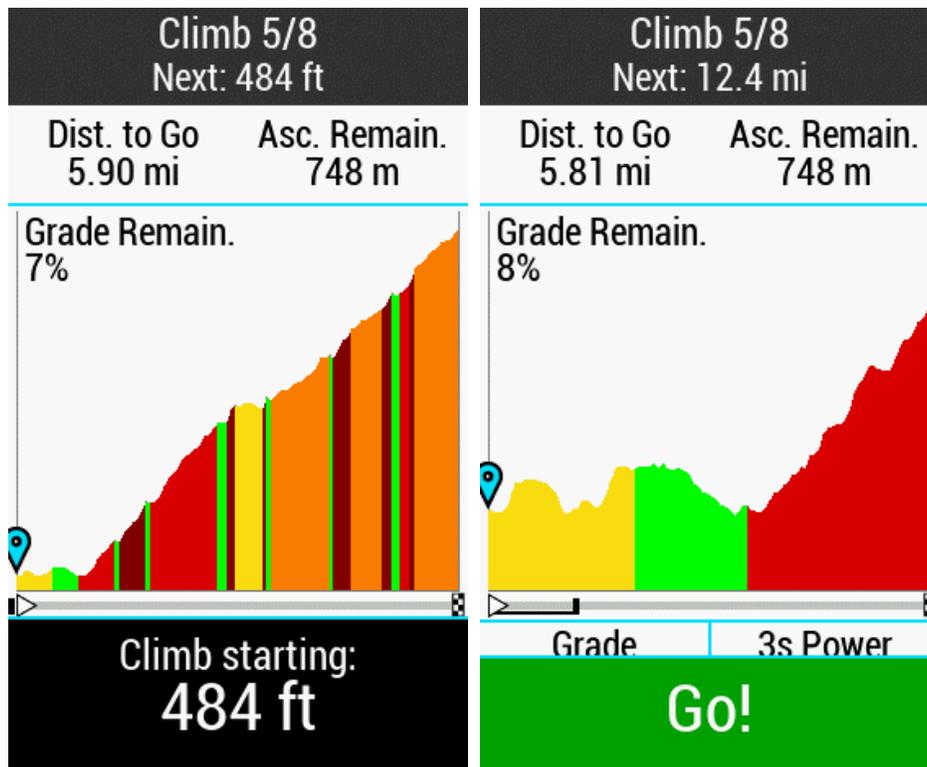|		
340m ... **17.72km**		Macro level. The elevation view from the course preview has identified two cat 3 climbs (yellow) and one HC climb (dark red).

8 Climbs
1710 m↑   **18.8 km**
 	
1   Start   Grade   Length
    11.9 km   10%   1.23 km
 	
2   Start   Grade   Length
    14.4 km   6%   1.15 km
 	
3   Start   Grade   Length
    17.1 km   9%   2.76 km
 	
4   Start   Grade   Length
		Micro level.
		
		Selecting climbs from under the course shows that ClimbPro has identified 8 climbs, with a total length of 18.8 km and with a total of 1,710 meters of climbing.
		
		You can see how far each climb is from the start, the length of the climb and the average grade.

	You can select a climb from the list to see how the grade/profile changes and what the ascent is for that climb.
	Here you can see how the grade colors change.

Can you describe the in-ride experience?

Once you have loaded your course the Edge will add a new training page that will show you how far you are from each of the climbs
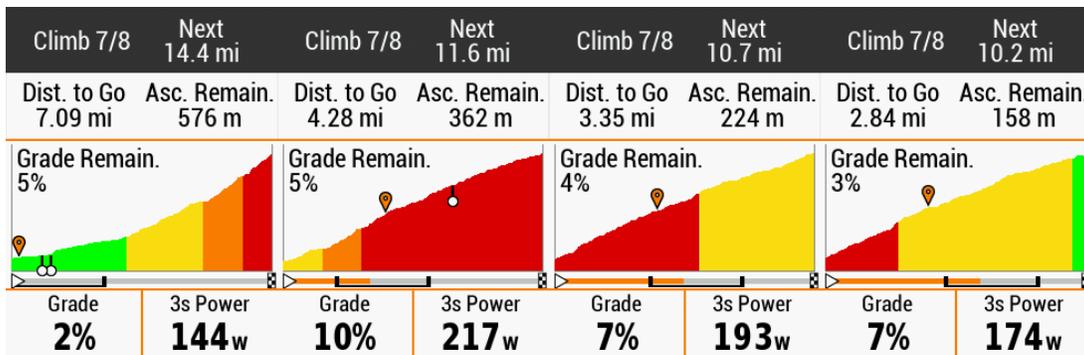

As you get close to a climb the Edge will switch to the ClimbPro page and give you an over view of the whole climb and then when you get to the start point it will report "Go!"
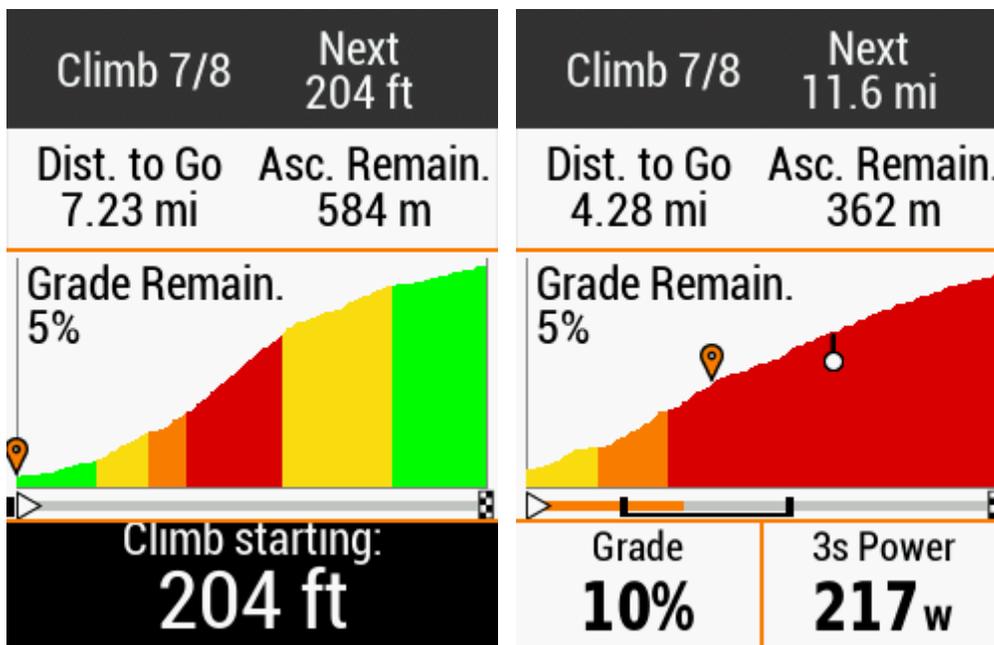
Whilst on the climb it will zoom in on the profile to give you a more detailed view of the profile. This is the same way that the segment page works when viewing the elevation profile of a segment.
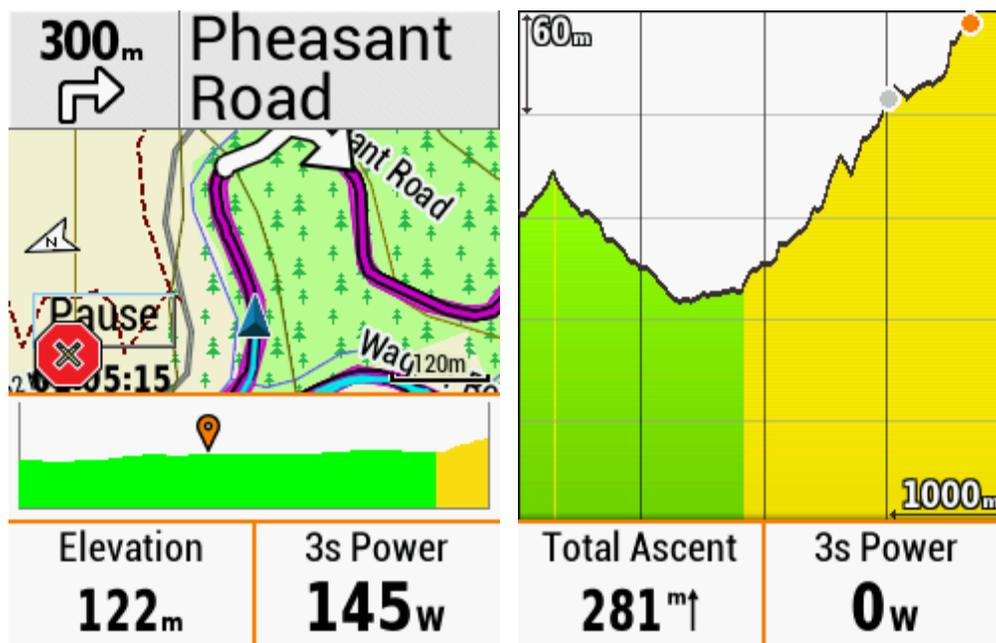
Here is an example of the zooming in operation on a climb. The orange progress bar is how far through the total climb you are and the two vertical black bars on the progress bar mark the section of the climb that is shown above the progress bar.

If there are grade changes outside of a grade zone it will color code them

The elevation profile will show the identified climbs at the Marco level. This is both on the elevation profile page and on the map page if you add elevation to that page. This option is controlled under the map screen settings for the activity profile you are using.
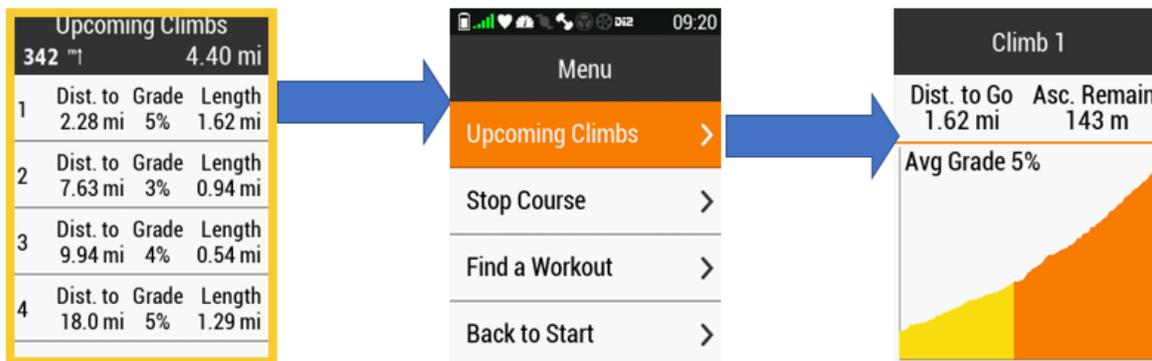

Can I view future ClimbPro profiles once I have started?

Yes, you can view what the profile of a future climb will look like before you get to it while you are riding the course.

On the 830 go to the ClimbPro upcoming climb list and just touch one of the entries and it will bring up the profile for it.

On the 530 as it does not have a touch screen go to the ClimbPro upcoming climb list and press the context menu button (top right) from there select Upcoming Climbs. You can then use the up/down keys to cycle through the climbs.

How does the use of ClimbPro differ from Segments?

Segments can be created for any terrain, not just hills. They are ideally suited for regions where you don't need navigation support because you are familiar with them and will ride them on more than one occasion and wish to compare your times on them.

ClimbPro is ideally suited for rides in a new area where you need navigation support and have not experienced the climbs before. It will provide you with information about the climbs and the distance between them so that you can better manage your efforts.

I understand the use case for ClimbPro, but can I still use segments

You can run segments and ClimbPro concurrently, but there are some nuances to understand.

If you are using Garmin segments, then the course must be created in Garmin Connect and transferred to the Edge using Garmin Express or Garmin Connect Mobile. This will create a course that has the segments embedded in it.

If you are using Strava segments, then the course must be created in Strava and transferred to the Edge using the Strava Route app on the Edge. This will create a course with the segments embedded in it.

When riding the course ClimbPro will take precedence over segments so if you have started a segment and then start a climb identified by ClimbPro the Edge will switch to the ClimbPro page. The segment is still being processed. The Edge will report when you complete the segment and you can still scroll to view the segment page.

I'm not seeing any climbs on the courses I load

First make sure that the course you are using has elevation data. If it does then the elevation profile is not meeting the requirements of ClimbPro. For users in flat regions this may be frustrating, but ClimbPro is designed to only report significant climbs.

Will ClimbPro break up a climb into multiple climbs if there are flat sections or descents in the climb?

Provide rule #2 is not broken then ClimbPro will treat it as a single climb

(Rule # 2 - Average grade of 3% or more)

Here is a real-world example. In the San Francisco bay area there is a well-known climb that ascends Mount Hamilton. The climb is long and has 2 significant descents in it, but because the overall grade is 4% the total climb is treated as a single climb by ClimbPro. This is using a Climb Score of 3,500 (Medium) as the threshold for selection.

STRAVA   🔍   Dashboard ⌄   Training ⌄   Explore ⌄   Challenges   **STRAVINI** ⌄

⭐ **Mt Hamilton - (Low-Key Hillclimbs)**
Edit title
Ride Segment Mount Hamilton, California

Distance	Avg Grade	Lowest Elev	Highest Elev	Elev Difference	Climb Category	23,507 Attempts By 8,261 People
29.53km	4%	117m	1,276m	1,159m	HC	

How does what ClimbPro compute match up to the real-world experience?

When comparing what ClimbPro has computed with what you experience when riding the course will be dependent on the quality of the elevation data that ClimbPro has to work with.

Most of the course planning sites are using DEM (Digital Elevation Models) data to provide elevation data. This can vary in resolution depending on the images and processing they used. I don't really have a way of evaluating the quality of DEM data from various sites. What I would suggest is trying some different sites for courses in your area and see which ones match the best to your real-world experience

If you have the option to build a course from data collected from someone's real ride data using a device with a barometric sensor that will likely give the best match. One thing to note is how that ride data is converted to a course. As of March 2020, Garmin Connect replaces the elevation data from the activity with data from the DEM when it builds a course. This is not what you want. To get around this download the activity file in FIT format from Garmin Connect and place it in the activity folder on the Edge and use the create course from an activity on the Edge to build the course. If you cannot gain access to the FIT file, then download it as TCX and use a TCX to FIT convertor to get the FIT file you need.

I have not tried other sites to see if they use the original elevation data when building a course from an activity or replace it with DEM data.

Estimated time to the top of the climb

New in the March 2020 build is an estimation of how long it will take you to reach the top of the current climb. When you are on a ClimbPro climb the Edge will take over the **Time to Destination** and **ETA at Destination** data fields and populate those with an estimate of how much longer it will take you to reach the top and what the time of day will be when you get there. You can add these data fields to a training page or replace one of the two data fields on the ClimbPro page with one of them.

The estimation uses a speed/grade lookup table. It takes your current grade and speed and uses that information to predict what your speed will for the other grades found on the climb.