

GPX Tracks Planning Document - Task 227

Document Notes:

1. Planning Document - describes the system in existence, and explains the aspects of the feature being planned.
2. Reference Document - team members attempting to figure out the specifics should be able to use some of the sections included as a quick reference for the GPX-XML tags needed.

The problem as presented by our design:

1. The current implementation of recording the path taken by the user when cycling runs into an issue with a planned feature, plotting a viable cycling pathway for the user on the map (instead of the straight lines currently drawn). If the user attempts to do this visual plotting for a recorded route using the appropriate maps API (Apple or Google, depending on the build), the massive number of recorded route points will most likely cause an API limit to kick in.
2. There is no convenient metadata tag in GPX to mark the routes as recorded vs planned. Adding one requires additional extensions; we are already extending the schema with a Rating tag on waypoints.
3. While it is possible to record time on waypoints and rte points (because they use the same type from the schema), it's less useful to record this data on plotted routes.

The solution I am suggesting is to switch recorded position data to using the GPX schema's track tag (type in schema: <trk>); this possibility was not explored previously due to our initial unfamiliarity with GPX and XML schema (this was recently rectified in Task 209). In addition, tracks use a sub-tag called track segments (<trkseg>) to delineate traveled chunks, so multiple tracks can exist without conflict on the same route.

List of changes to make:

1. Add functions for the track (and ID), track segments as appropriate, and track points.
2. Recorded pathways should use tracks instead of routes (current state).

An example of the expected usage based upon the schema in GPX is below, showing a basic hierarchy of the track components (tags) to be used:

```
<gpx>
  <trk>
    <type>Cycling</type>
    <trkseg>
      <trkpt lat="#" lon="#">
        <time>{dateTime string}</time>
      </trkpt>
    </trkseg>
  </trk>
  <wpt lat="#" lon="#">
    .. our existing waypoint organization ..
  </wpt>
</gpx>
```

References

GPX Schema 1.1 - <https://www.topografix.com/GPX/1/1/>

GPX Explication and Useful Info - <https://mapscaping.com/gps-exchange-format-gpx/>