'CYCLING TRAILS ACROSS THE US' CONSOLIDATED MAPPING PROJECT

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Proposal: 'Cycling Trails Across the US' Geospatial Mapping Web Portal.

Problem Statement: Cycling has become more popular in the United States for exercising, commuting and general recreation. But there is no single resource for users to research cycling trails. This proposal is to create a web portal that allows users to view, submit and rate cycling trails across the United States.

1. Introduction
The number of people who rode bikes in the United States in 2022 was 54.7 million, which represents a 7% increase from the year before. Industry experts are estimating a yearly increase in demand of bicycles of 5.3% between 2020 until 2027. The increase in demand is driven by numerous factors, including the rise of environmental awareness, an increasing emphasis on fitness and health, and the increasing popularity of bicycles as an alternative form of transportation.

2. Focus Area
The study area for this proposal will focus on the contiguous United States (CONUS) which includes the 48 US states on the continent of North America including the District of Columbia. The total area and population for the county is as followed:
   - 3.1 million square miles
   - 333 million people in the United States

As of the 2022 Census data, the population was 333M with the following geographic breakdown:

Region	Population	% of Population
Northeast	56,983,517	17%
Midwest	68,909,283	20.6%
West	78,896,805	23.6%
South	130,125,290	38.9%
Totals	333,287,557	100%

3. Data Methodology
The data used for this analysis will be downloaded from multiple sources including:
   - OpenCycleMap API
     - https://www.thunderforest.com/docs/map-tiles-api/
   - Department of Transportation National Transit Routes and National Transit Stops (shapefile or geoJSON).
     - https://geodata.bts.gov/datasets/80086198b67c456194b064ba21b82326_0/explore?location=39.304663%2C-115.293335%2C6.59
     - https://geodata.bts.gov/datasets/b7832004516e4d02b60631bbd7bef4e1_0/explore?location=14.439155%2C147.000767%2C2.03
   - TrailForks Mountain Bike Trails (JSON)
     - https://www.trailforks.com/about/api/
   - ESRI State Boundaries (shapefile or geoJSON)
     - https://hub.arcgis.com/datasets/1612d351695b467eba75fdf82c10884f/explore
   - User submitted information

4. Proposed Web Portal Structure

This proposal will attempt to provide the following functionality:
- Backend Oracle database
- Microsoft Azure virtual machine infrastructure
- Front end web site with user view and submission capabilities
- Cycling trail metadata (see [5] below for included metadata)
- User capabilities to map routes
- Functionality to import existing trails and have multiple layering resources

5. Objectives
The first objective is to produce a map which will include the following meta data:
- Distance
- Difficulty rating
- Trail condition (paved, dirt, gravel)
- User comments
- Closest connecting commuting line

The second objective of this proposal is to estimate a cost for implementation for a minimal viable product (MVP), the expected user base, and a return on investment (ROI).

6. References

Study: 103.7 million American ride bikes. (Unpublished Date). Velo Powered by Outside. https://velo.outsideonline.com/news/study-103-7-million-americans-ride-bikes/.

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