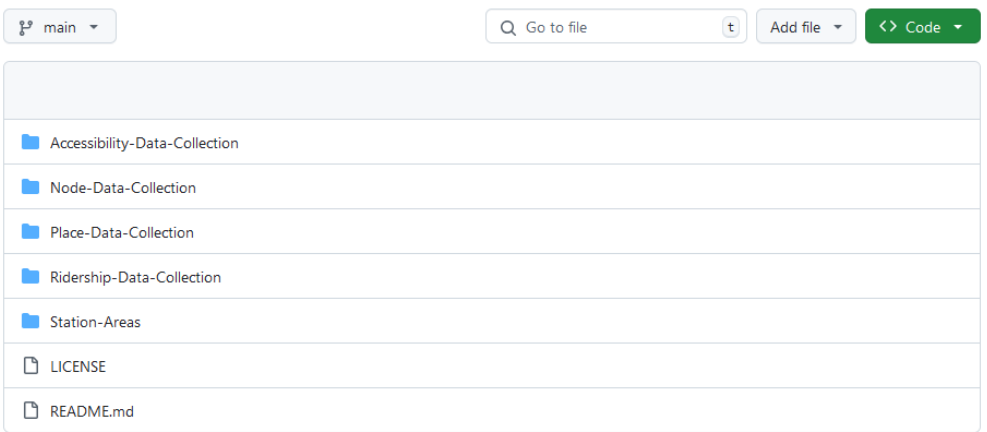
Node-Place-Accessibility-Ridership-Time-Model



Node Place Accessibility Ridership per Time (NPART) Model in the Hauts-de-France Region

Welcome to the *GitHub* repository dedicated to implementing an extended **Node Place Accessibility Ridership per Time Model** applied to the Hauts-de-France region. This project aims to provide a comprehensive framework for assessing the urban and transportation infrastructure within the region, leveraging spatial analysis to better understand the connectivity and accessibility of various places.

Project Overview

The Node Place Index Model is a critical tool for urban planners, geographers, and policymakers aiming to evaluate and enhance the mobility landscape of urban areas. By applying this model to the Hauts-de-France region, we seek to identify key areas of improvement, potential for development, and strategies for sustainable urban mobility.

This repository contains all the necessary **Python codes** used throughout the project stages. These resources are designed to be **openly accessible**, enabling others to replicate the study, contribute to its improvement, or adapt the methodology to their own regions. The code includes:

- **1. Codes for Generating Railway Stations Neighborhoods**;
- **2. Codes for Spatial and Statistical Data Collection**;
- **3. Codes for Statistical Analysis and Clustering**.

1. Codes for Generating Railway Station Neighborhoods

- Pedestrian and Cycling Buffers
- Pedestrian and Cycling Isochrones

2. Codes for Spatial and Statistical Data Collection

Node (N) *Transit*	Place (P) *Development*	Accessibility (A) *Oriented*	Ridership per Time (RT) *Demand*
N1: Frequency (Weekdays, High-speed Rail)	P1: Population Density	A1: Length of Walking Paths	RT1: Off-Peak Hour Ridership (Weekdays, 12AM-6AM)
N2: Frequency (Weekends, High-speed Rail)	P2: Employment Density	A2: Intersection Density	RT2: Peak Hour Ridership (Weekdays, 6AM-10AM)
N3: Frequency (Weekdays, Regional Rail)	P3: Residential Land Use	A3: Pedshed and Bikeshed Ratios	RT3: Off-Peak Hour Ridership (Weekdays, 10AM-3PM)
N4: Frequency (Weekends, Regional Rail)	P4: Commercial and Public Service Land Use	A4: Length of Cycling Paths	RT4: Peak Hour Ridership (Weekdays, 3PM-8PM)
N5: Service Span (Weekdays)	P5: Office and Industry Land Use	A5: Cycling Parking Capacity	RT5: Off-Peak Hour Ridership (Weekdays, 8PM-12AM)
N6: Service Span (Weekends)	P6: Green Space Land Use	A6: Public Sharing Bicycles	RT6: Off-Peak Hour Ridership (Weekends)
N7: Commercial Rail Speed	P7: Proximity Points of Interest	A7: Metro and Tramway Stops	
N8: Number of Directions	P8: Intermediate Points of Interest	A8: BRT and Bus Stops	
N9: Degree Centrality	P9: Superior Points of Interest	A9: Motorized Speed Limit	
N10: Closeness Centrality	P10: Residential Real Estate	A10: Car Parking Area	
N11: Betweenness Centrality	P11: Industrial, Commercial and Office Real Estate	A11: Household Motorization	
N12: Reachable Stations (One Hour)	P12: Share of affordable housing		
N13: Stations to Lille	P13: Income per Household		
N14: Travel Time to Lille			
N15: Stations to Paris			
N16: Travel Time to Paris			