



CONFERENCE CODATU XVIII

CETUD - 2^{ÈME} ASSISES TERRITORIALES DE LA MOBILITÉ URBAINE

SOMMET CLIMATE CHANCE AFRIQUE

DU 4 AU 6 OCTOBRE 2022

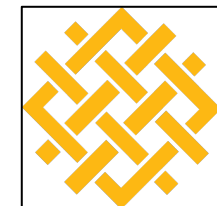


Putting **Khartoum** (Sudan) on the **Map** - 06 October 2022

Transforming Africa's Transit through the DT4A Innovation Challenge

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DT4A Innovation Challenge



WORLD
RESOURCES
INSTITUTE

KRT
KHARTOUM - MAP
السكة سكتنا .

The Core Team

Co-Director



Ilham Ali is a master's graduate from MIT in the Technology & Policy Program. She specializes in the intersection of sustainable development with satellite remote sensing and geospatial data. Ilham is the founder of ZAHARA for Education, where the mission is to expand educational opportunities between Sudan and the US. She has experience working in a range of volunteer and youth initiatives in Sudan.

Co-Director



Awad Abdelhalim, Ph.D., is a post-doctoral researcher at the MIT Urban Mobility Lab. He completed his doctoral dissertation on computer vision and transportation safety at Virginia Tech's Department of Civil Engineering. He is a B.S. graduate of the University of Khartoum's School of Civil & Environmental Engineering. Awad has also worked as a Research Associate at the DC Department of Transportation.

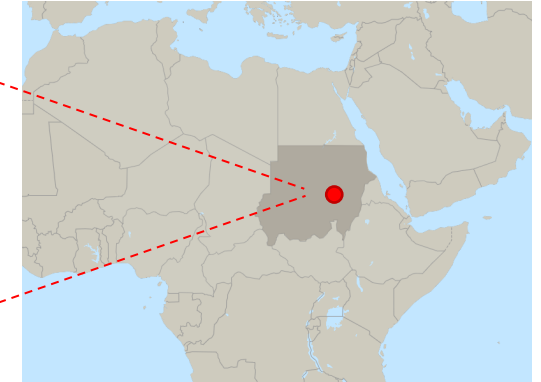
Head of GIS
& Transit Data



Abubakr Ziedan is a Ph.D. candidate in Civil Engineering at the University of Tennessee Tickle College of Engineering. He earned his M.S. in Civil Engineering from the University of Tennessee, Chatanooga and his B.S. first-class honors from the University of Khartoum. Abubakr has worked previously as a Transportation Planner at the Ministry of Infrastructure and Transportation in Khartoum.



Khartoum, Sudan



Transit Woes in the Capital

According to previous studies by the Ministry of Transportation, approximately 80% of the population of Khartoum relies on some combination of bus transportation and walking for their daily modal needs.



- Rising prices
- Long queues
- Overcrowding
- Low Availability
- No visibility into the system

KhartouMap Project

Location:
Khartoum, Sudan

KRT
K H A R T O U M - M A P
السكة سكتنا .

1

Public Communications and
Raising Awareness of Project

2



Mapping &
Validating GPS
Routes

3

Conducting Neighborhood-
Level Transit Mobility Surveys

4

University Hackathon & Start-up
Seed Fund Opportunities



Khartoum has a Single-Modal Transport System

Most, if not all, routes are operated by private vehicle owners driving an aged fleet of diesel buses and vans. There is no light-rail system, and train service serves only cross-city travel (despite short-lived government plans to reopen intracity train transport in 2019).



Mitsubishi Rosa
Buses, 25 passengers



Toyota Hiace Vans, 12-
14 passengers



Amjad Vans, 7-8
passengers



**Transit Stops are Formal and Informal
Throughout the Tri-City Area**

Successful Route Mapping and Validation is Underway

- Multiple data streams are integrated and validated
- Field teams collect GPS tracks on active routes
- The data processing team has created automated corrective scripts for standardization to OSM

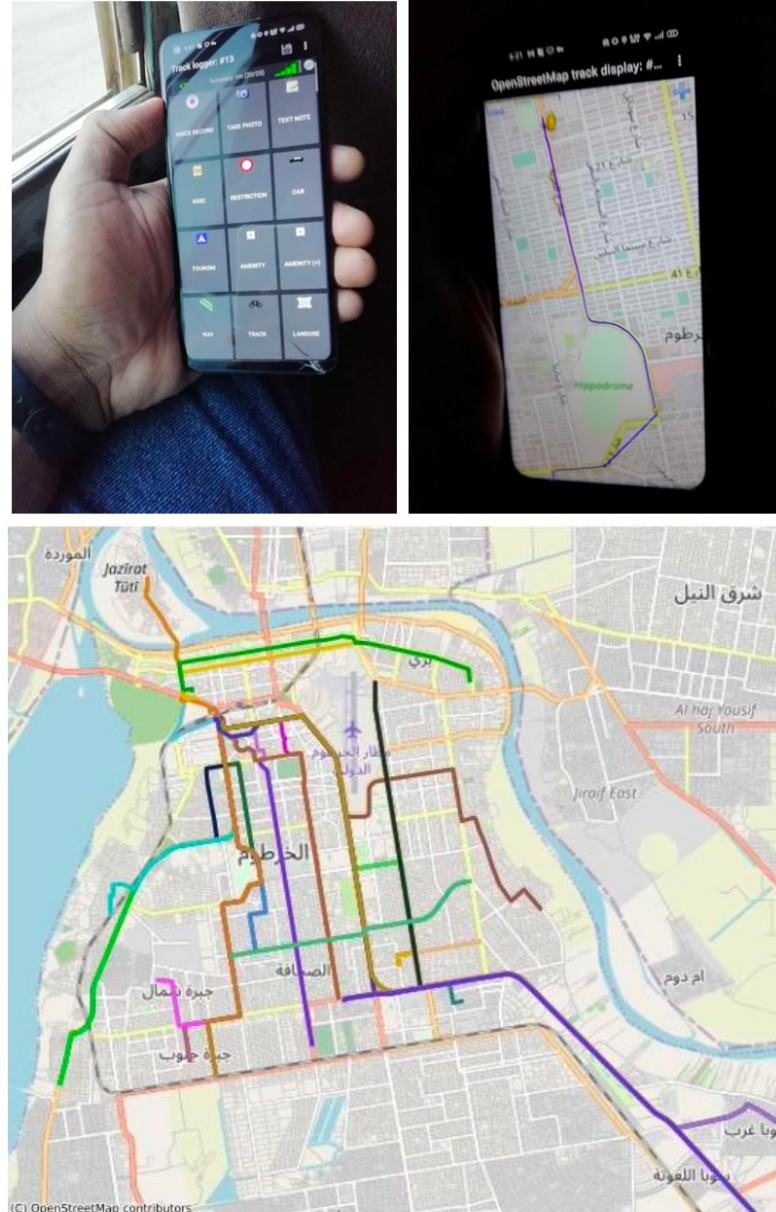


Figure 4. Mapped and Validated Routes in Khartoum, Sudan.



5 Project Deliverables Are Key Steps Towards Transit Improvements



Deliverable #1: GTFS Bus Route Database

- Required field data to be collected about routes spanning the entire tri-city capital area, including and making special efforts to reach underserved areas

- Stops.txt
 - Stop_id
 - Stop_code
 - Stop_name
 - Stop_desc
 - Stop_lat
 - Stop_lon
 - Location_type
 - Parent_station
- Routes.txt
 - Route_id
 - Route_short_name
 - Route_long_name
 - Route_desc
 - Route_type
 - Route_sort_order
 - Continuous_pickup
 - Continuous_dropoff
- Shapes.txt
 - Shape_id
 - Shape_pt_lat
 - Shape_pt_lon
 - Shape_pt_sequence
 - Shape_dist_traveled
- Translations.txt
 - Table_name
 - Field_name
 - Language
 - Translation
 - Record_id
 - Field_value

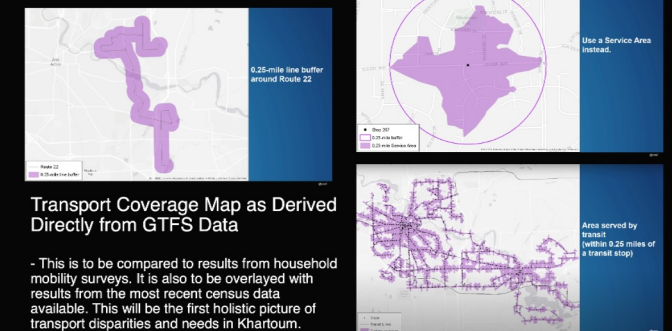
Deliverable #2: Paper Transit Route Map

- Visual map of the transit routes in the city



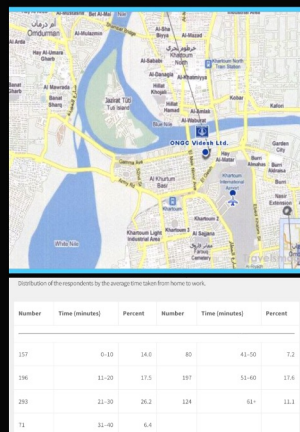
Deliverable #3: Khartoum Transit Coverage Map

- Map detailing the areas served by the transit routes. In other words, which residents are able to access the transit system with ease?



Deliverable #4: Representative Household Surveys on Mobility, by Neighborhood

- Sample Fields
 - Transit Use Type
 - Frequency of Use
 - Avg Amount Spent, Day
 - Avg Amount Spent, Month
 - % of Total Income
 - Time on Transit
 - Disability Needs
 - Average Wait Time
 - Time of Day
 - Source of Largest Service Distributions



Deliverable #5: University Student Projects & Contests

These contests & projects will be organized to encourage college students to make first-use of the data amassed and begin making transit innovations and solutions for Khartoum.

- Open Data, Question Prompts
 - Using Khartoum GTFS data, propose optimal new transit stops.
 - Augment current single-modal transportation with 1-2 more proposed means.
 - Consider both energy-use & pollution from current transport. Devise a solution to lower particulate matter and increase energy efficiency.
 - Advise on human behavioral strategies to reduce traffic deaths to pedestrians.
 - Artistically reimagine empty roadside spaces for new uses including vendors and greenspace.
 - Imagine the construction of a dedicated electric bus-line. Where should it be placed to ease traffic issues in the tri-city?
 - Using the household survey data, provide solutions to address disparities in transportation access for marginalized groups in Khartoum.



Project Sponsors

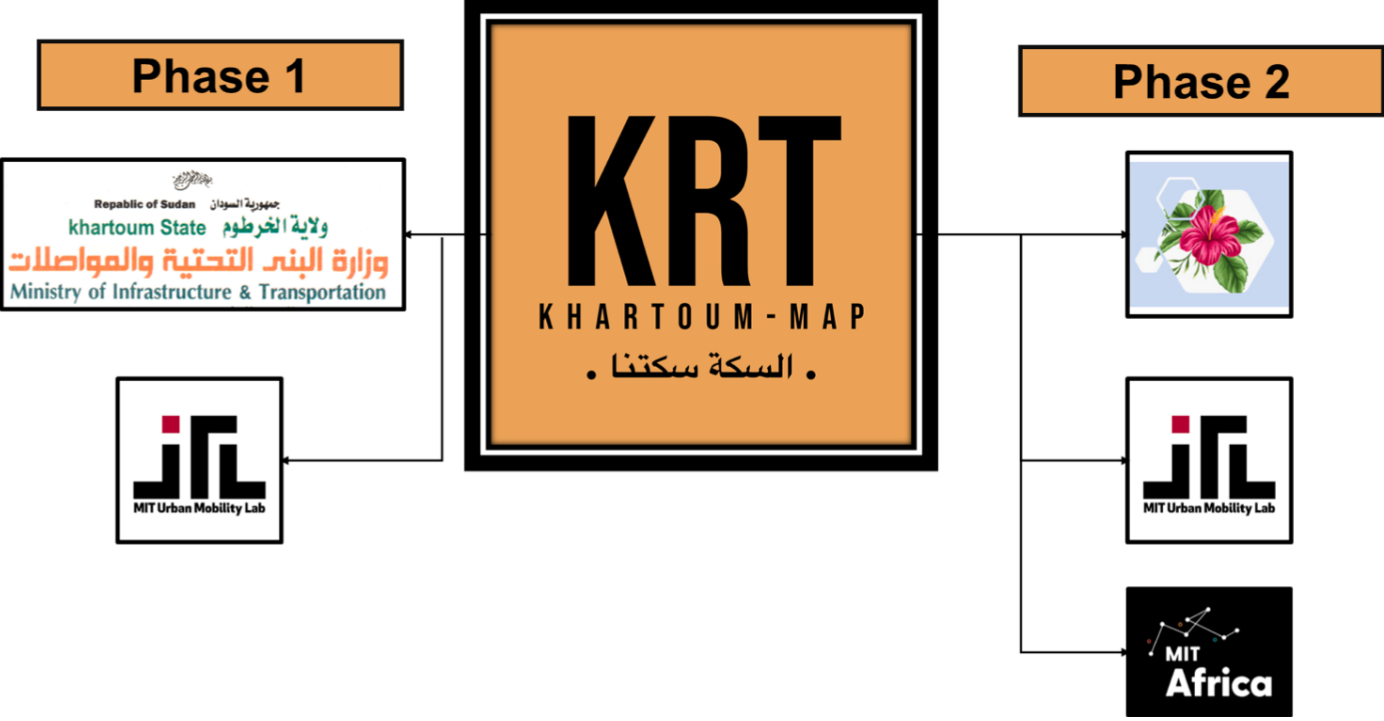


Figure 2. Stakeholders Mapping.



How Can You Help KhartouMap?



1) Support the Household Mobility Survey Effort

With additional financial support, we can expand the survey reach and its representation of the population.

2) Sponsor a University Hackathon Prize

We have three prizes available and are looking to expand the opportunities available with named prizes.

3) Match the Seed Fund Allocation

Seed fund will go to support MVP development of startup based on transit data produced. Seeking a matching donation to support the entrepreneurial ecosystem.

4) Conduct Accessibility or Comparability Studies with other Cities

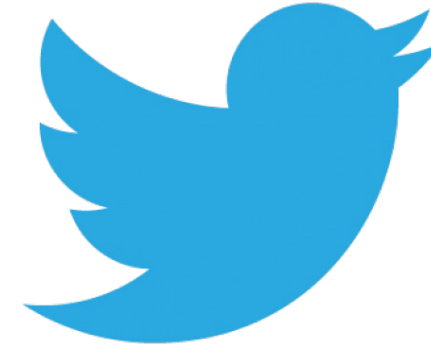
We are very interested in comparability of Khartoum with other regional or global cities and invite researchers to commit to using our data.

5) Contribute to the Crowdsourcing Effort

We are opening a parallel open data collection effort, and we invite all in Khartoum to participate.

Contact Us!

KhartouMap on Socials:



Hashtags: #KhartouMap السكة سكتنا

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