

## Development of a Comprehensive Disaster Resilience System and Collaboration Platform in Myanmar: Transportation and Human Mobility Perspective Project Progress Report

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### 1 PROJECT AIMS

This project aims to build a disaster safety city through research and development efforts in order to improve effective disaster management and emergency preparedness in Myanmar.

### 2 TRANSPORTATION AND HUMAN MOBILITY GROUP

Transportation and Human Mobility Group is one of the research and development groups in this core project. The goals of our group are:

- To understand human mobility and travel behaviors in Yangon City for effective disaster management and emergency preparedness
- To measure public transport traffic congestion status in Yangon City to improve future public transport bus route planning
- To develop a real-time geospatial data collection, sharing, retrieving, visualization and building a geospatial analysis platform (G-SPACE) for emergency response system

### 3 RESEARCH AND DEVELOPMENT PROGRESS

#### Geovisualization of people flow in Yangon City using CDR Call Detail Record

Understanding human mobility (“Where people flow”) from spatial perspective is important for effective urban transportation planning, traffic congestion analysis and public facility management. This research aim to visualize people flow in Yangon City using mobile call data and road network data model. In this research we estimated every mobile phone user origin and destination route for one-day trip.

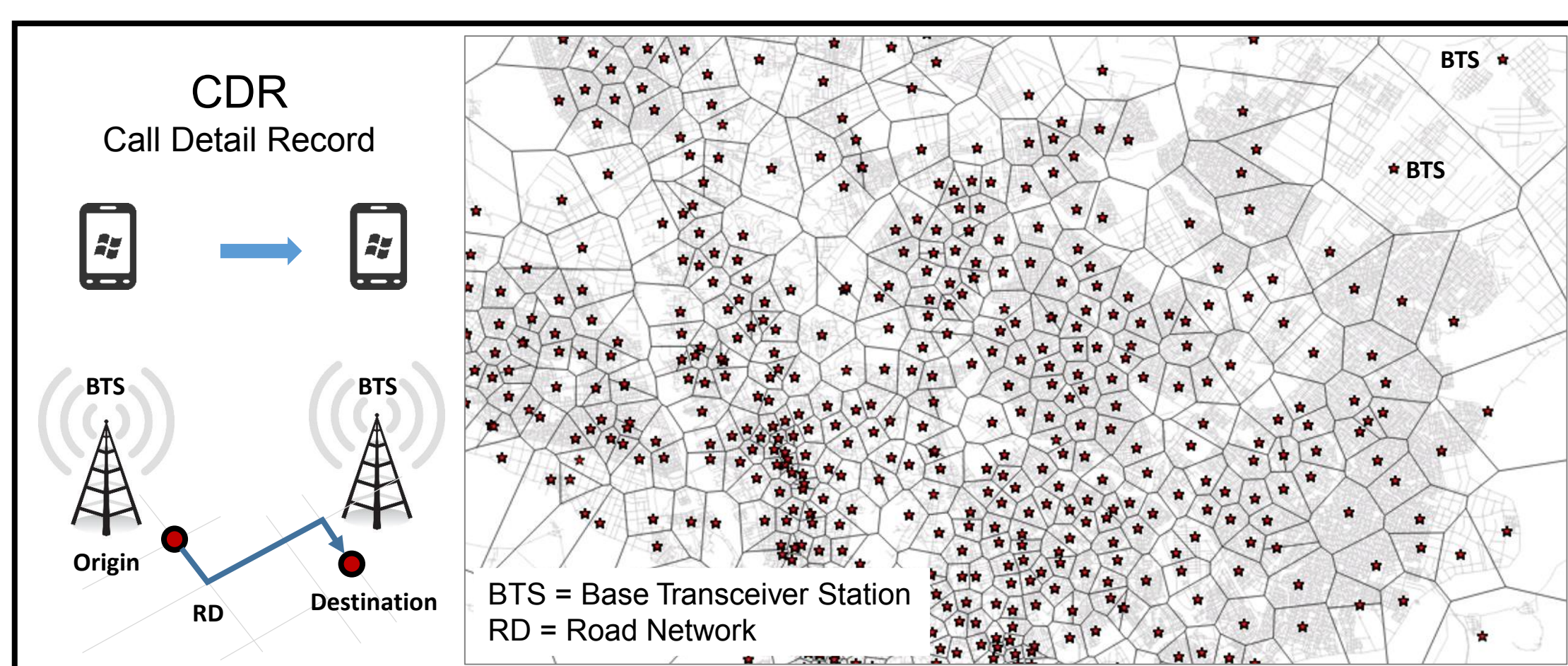


Figure 1. Origin and Destination route identification from CDR data and road network data model.

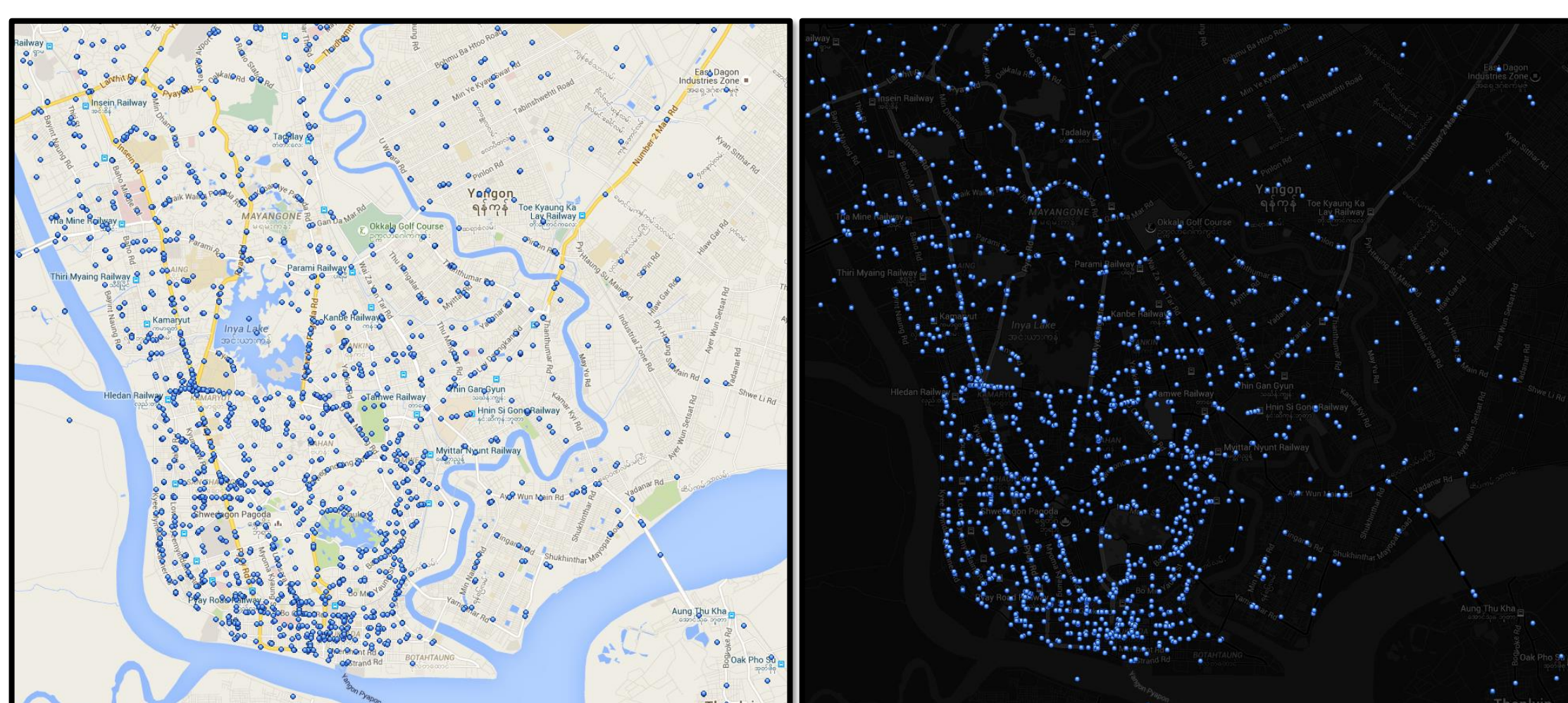


Figure 2. Yangon City people flow geovisualization with CDR data using “Mobmap” google API.

#### Building a Grid-based Multi-temporal Population data generated from Person Trip data and mobile CDR

Dynamic population data at multi-temporal scale is essential to every city and urban planners, transportation planners, disaster management teams, retail and market managers and so on. In this research we used geospatially enable person trip data integrates with mobile CDR data to generate a grid based population data (250m X 250m) at multi-temporal scale (i.e. every 30 minutes).

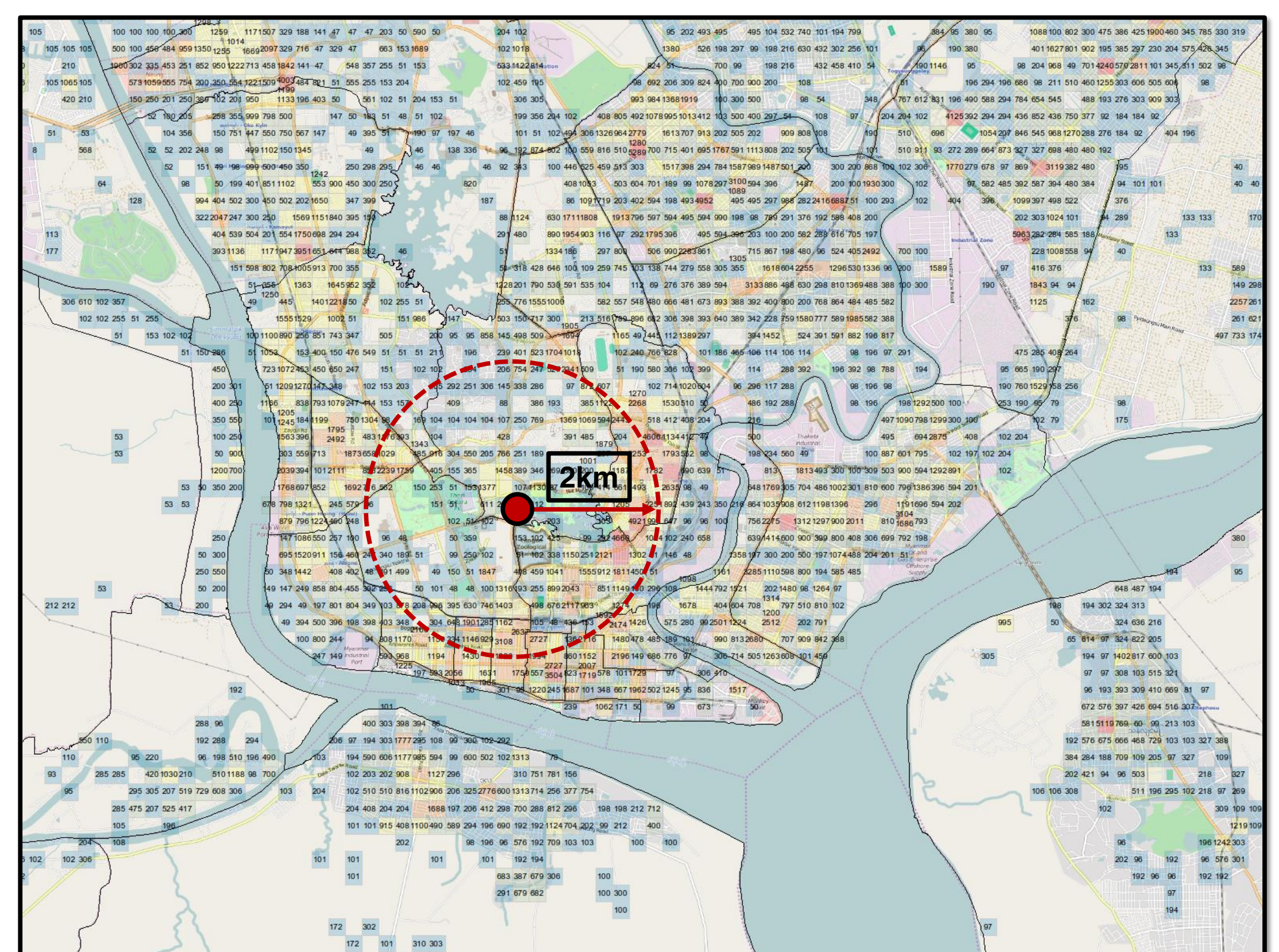


Figure 3. Grid-based multi-temporal population (every 30 minutes at spatial resolution 250m X 250m) generated from geospatially enabled person trip survey data and mobile Call Detail Record (CDR)

#### Public Transport Traffic Congestion Mapping and Bus Route Optimization Analysis

In order to improve public bus transportation system in Yangon City, we need to study current traffic congestion status, traffic volume and locations of bus stops. Until now, Yangon City does not have any sophisticated traffic monitoring and congestion control systems, we mounted GPS on public buses and measured the every bus positions, speed and direction by every day. We used these GPS trajectory data to measure each road segment traffic congestion status and finally map the whole public transportation system in Yangon City. The data collection is ongoing process and we expected to collect from 500 buses in various public transportation lines in Yangon City.

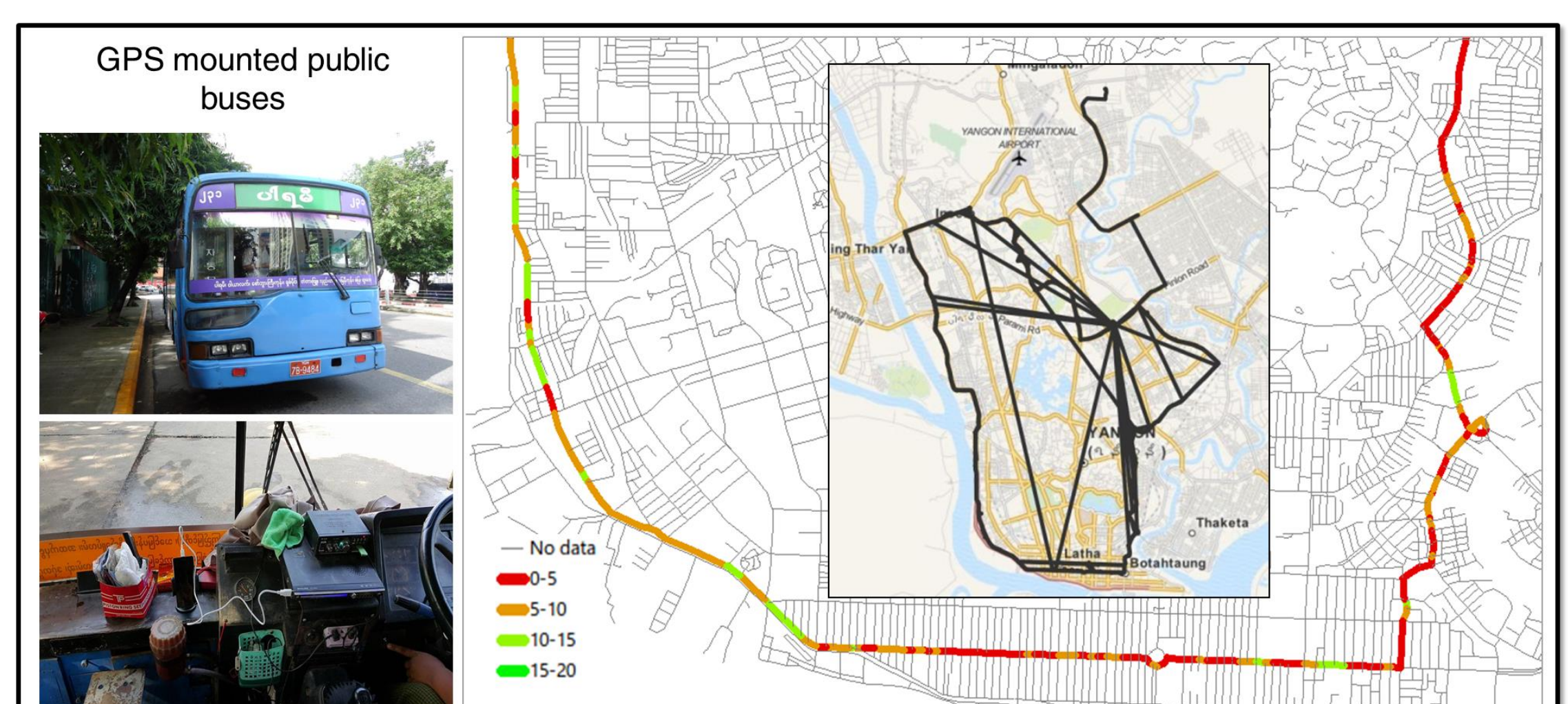


Figure 4. Bus GPS tracking data collection system and public bus traffic congestion mapping