**SCOPE OF WORK**

The project is in collaboration with StarHub, to integrate spatial and temporal analytics to understand human movement pattern and connectivity, taking dwelling time into consideration when relevant. The research will entail the use of StarHub’s mobile geolocation data, which will be overlayed onto StarHub’s geolocation grid, and thus be presented as aggregated geolocation insights. The scope includes the following:

1. To examine spatio-temporal human movement pattern across the island during five selected major events to identify human hotspots for cleanliness planning (retrospective data). The analysis will also compare movement pattern between weekend and weekday;

Data required: Retrospective cellular insights for the following 5 events during these 5 sets of dates. To provide hourly snapshots of human movement data at specific locations, with simple profiling e.g. foreigners vs. locals.  The shape files of the locations of concern will be provided.

* + 1. New Year Countdown: 31 Dec 2014 – 1 Jan 2015
    2. Chinese New Year: 7 – 8 Feb 2015, 14 – 15 Feb 2015, 18 - 19 Feb 2015
    3. Thaipusam: 3 Feb 2015
    4. Hari Raya: 4 – 5 July 2015, 11 – 12 July 2015, 16 – 17 July 2015
    5. National Day Parade: 1 Aug 2015 (Preview), 7- 9 Aug 2015.

1. To examine spatio-temporal human movement pattern (connectivity) across the island to understand the potential impact of any dengue transmission area on all other parts of the island (retrospective data), and to also understand movement dynamics in areas of persistent dengue transmission. Connectivity data will be generated in a format that can be compared with existing geolocation data (e.g., EZlink data) at the EHI. The analysis will compare across different time periods (e.g., weekend vs. weekday, day vs. night). Basic demographics (e.g., age-band, gender and housing type etc.) will be provided to further analyze specific groups of people;

Data required: Selected aggregated weekly and monthly cellular insights between Jan 2015 to Dec 2015.

1. To examine monthly movement patterns of people that move in and out of Singapore border checkpoints to understand their spatio-temporal distribution;

Data required: Selected aggregated retrospective cellular insights, up to 24 months.

1. To examine dwelling time and movement pattern (such as congregation) of specific segments of population, including students, homemakers, domestic helpers, foreign workers and retirees by dwelling type (HDB, condominium and landed houses) and across different time (e.g. weekday vs. weekends, day vs. night) Segments that exhibit similar geolocation behavior can be grouped together (e.g., homemakers, retirees and domestic helpers).;

Data required: Retrospective aggregated cellular monthly insights for 3-month period that encompasses school terms and school holidays;

1. To examine spatio-temporal movement of workers and nearby residents of up to 10 construction sites, to understand the spread of the cases in the neighborhood, and the interconnectivity of dengue clusters associated with construction sites.

Data required: Retrospective aggregated monthly cellular insights, exact time frame to be determined during the course of research, limited to 1-month of insights per site, and pending data availability.

Results derived from this project will enable NEA to understand human movement pattern and its relation to dengue transmission, and to guide intervention measures for pre-emptive control efforts. It would also facilitate NEA’s operational planning for cleaning and enforcement against littering offences, as well as guide placement of litter bins, posters and other educational material.