Mobile Network Big Data for Smarter Urban & Transportation Planning

LIRNE*asia*

http://lirneasia.net/projects/bd4d/

L I R N E *a s i a*

Pro-poor. Pro-market.

IDRC ✳ CRDI

Canada

UKaid
from the British people

Mobile Network Big Data is only option at this time

	Mobile SIMs/100	Internet users/100	Facebook users/100
Myanmar	50	2	12
Pakistan	73	10	11
India	73	18	9
Bangladesh	76	10	9
Sri Lanka	107	26	16
Philippines	112	40	41
Indonesia	125	17	25
Thailand	143	35	49

Source: ITU Measuring Information Society 2014; Facebook advertising portal

LIRNEasia
Pro-poor. Pro-market.

Hourly loading of base stations reveals distinct patterns
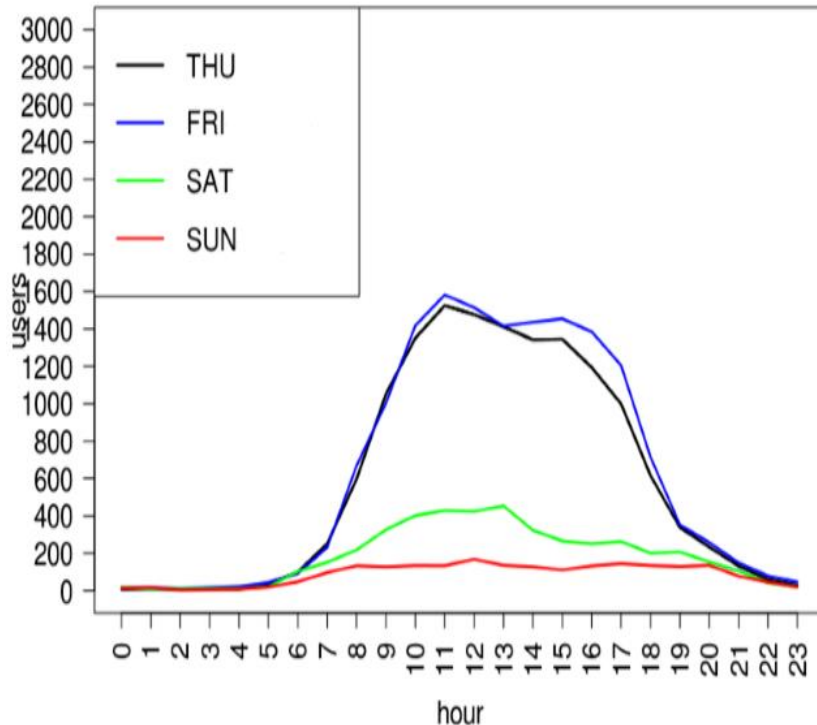

Type X: ?
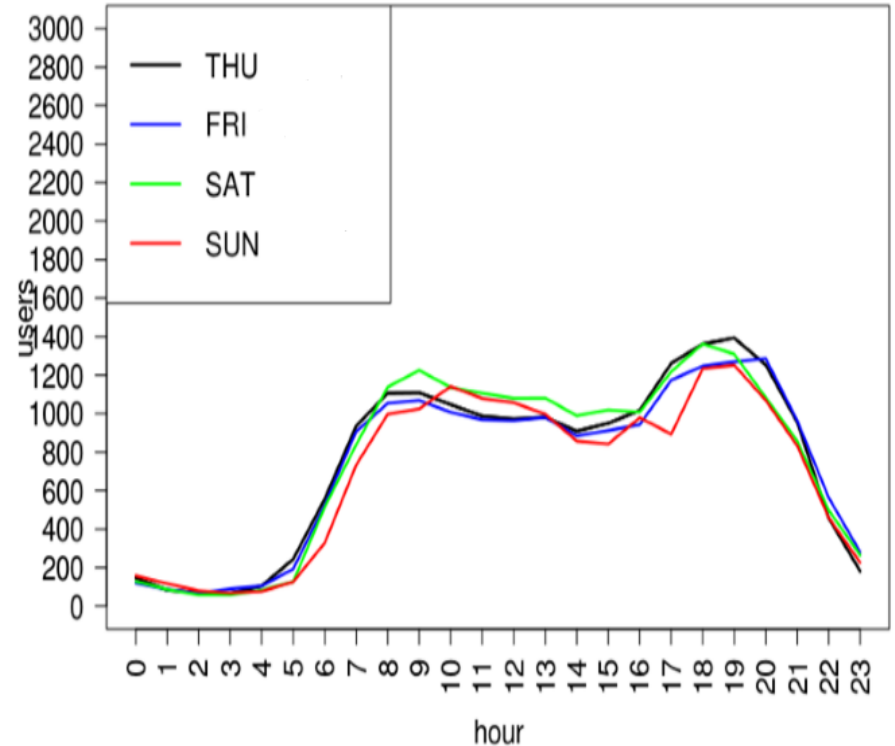
Type Y: ?

- We can use this insight to group base stations into different groups, using unsupervised machine learning techniques

Three spatial clusters in Colombo District

- **Cluster-1 exhibits patterns consistent with commercial area**

- **Cluster-3 exhibits patterns consistent with residential area**

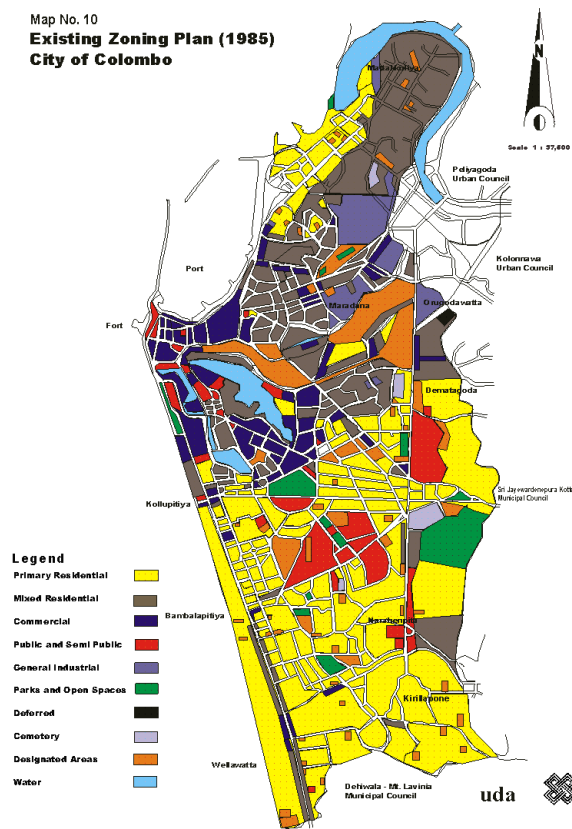- **Cluster-2 exhibits patterns more consistent with mixed-use**

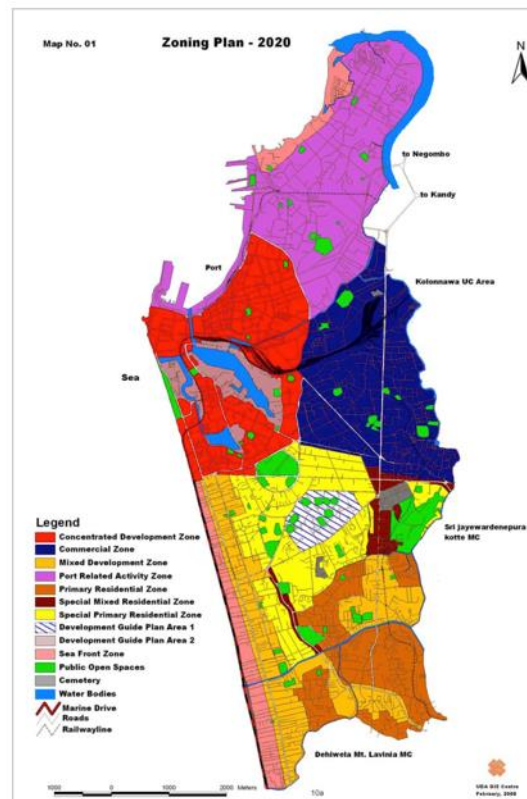# Our results show Central Business District (CBD) in Colombo city has expanded
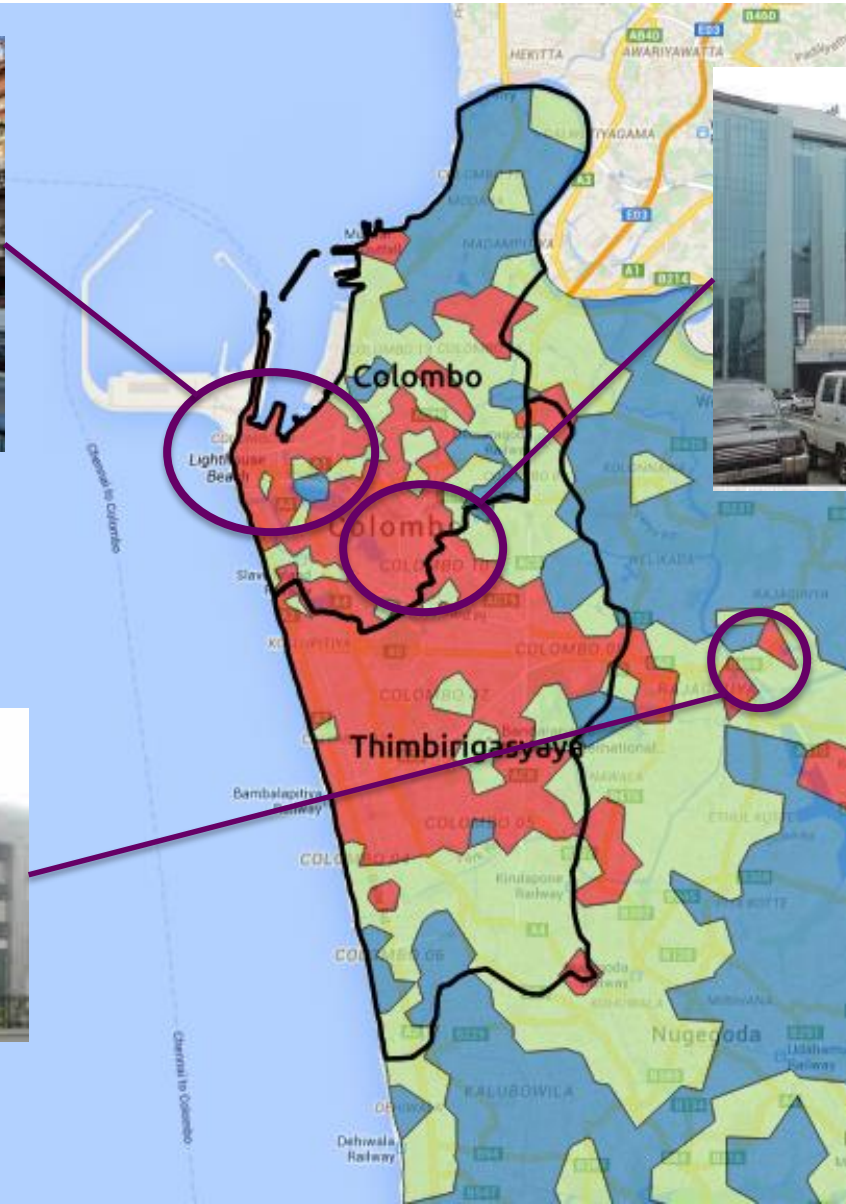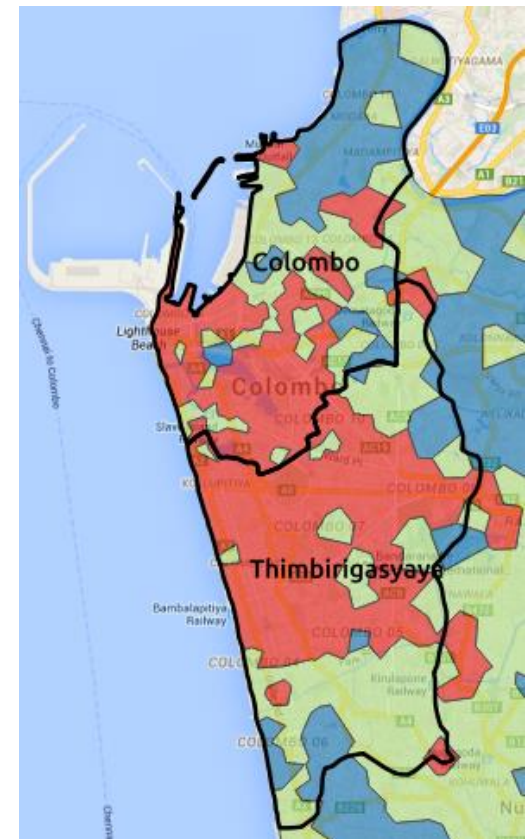
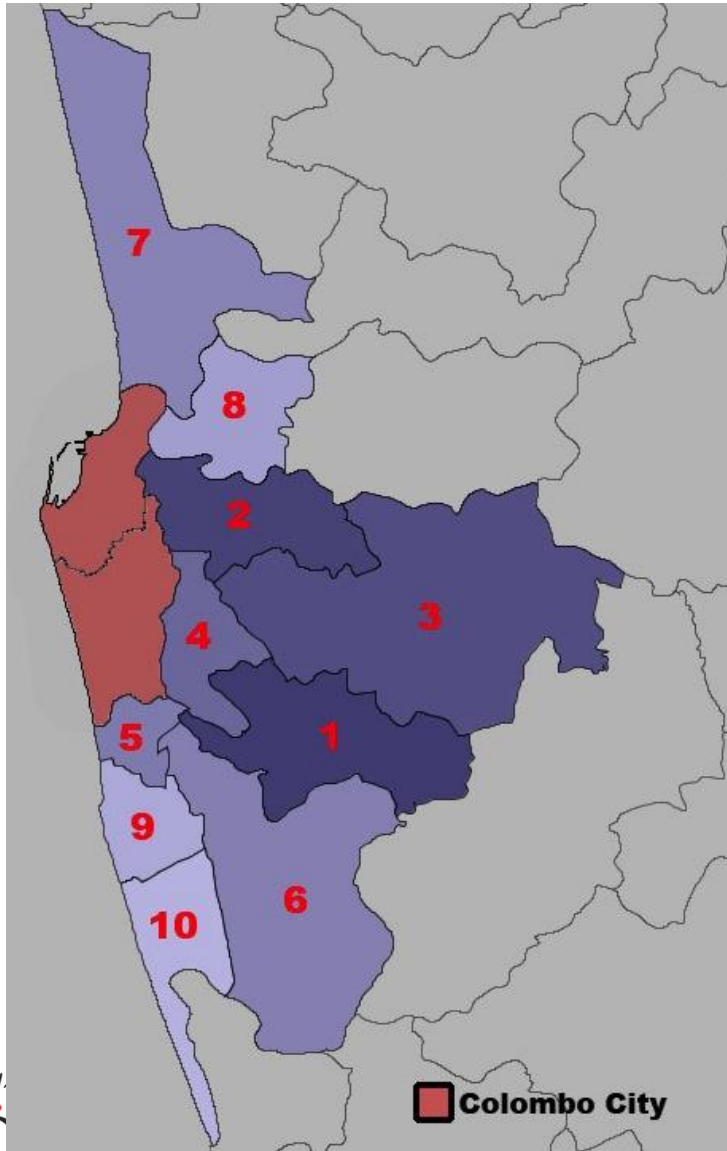# Plans & reality

1985 Plan

2020 UDA Plan

2013 reality

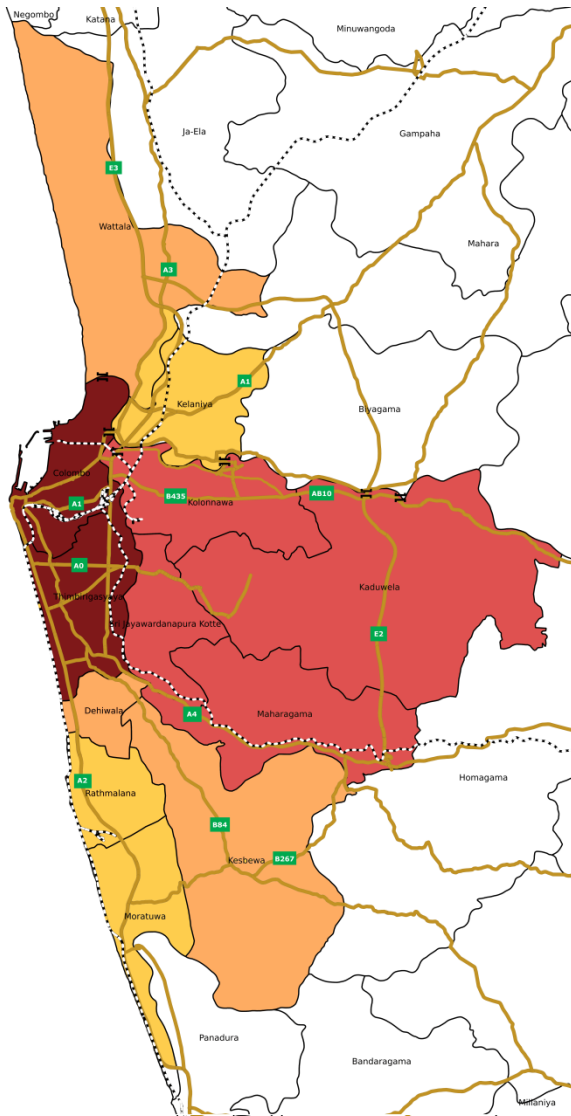# 46.9% of **Colombo City's** daytime population comes from surrounding DSDs, but some surprises . . .

Colombo city is made up of Colombo and Thimbirigasyaya DSDs

Home DSD	%age of Colombo's daytime population
Colombo city	53.1
1. Maharagama	3.7
2. Kolonnawa	3.5
3. Kaduwela	3.3
4. Sri Jayawardanapura Kotte	2.9
5. Dehiwala	2.6
6. Kesbewa	2.5
7. Wattala	2.5
8. Kelaniya	2.1
9. Ratmalana	2.0
10. Moratuwa	1.8

Do the current LG boundaries make sense?

- Commuters cause costs which are not reflected in city revenues

- Fragmented governance makes coherent planning for transport, flood control, solid waste management, etc. difficult

Potential configurations of a Metropolitan Corporation

Home DSD	Population	Percentage contribution to Colombo's daytime population
Colombo City (2 DSDs)	555,031	53.1
Maharagama	195,855	3.7
Kolonnawa	190,817	3.5
Kaduwela	252,057	3.3
Sri J'pura Kotte	107,508	2.9
Dehiwala	807,834	62.6
Kesbewa	244,062	2.5
Wattala	174,336	2.5
Kelaniya	1,807,600	72.1
Ratmalana	95,162	2.0
Moratuwa	167,160	1.8
Total	2,204,015	79.9