



GOVERNMENT OF INDIA
MINISTRY OF HOUSING AND URBAN AFFAIRS



INFLUENCE OF LAND USE ON DIURNAL PATTERN OF TRANSIT RIDERSHIP



A TOD PERSPECTIVE ON DELHI METRO

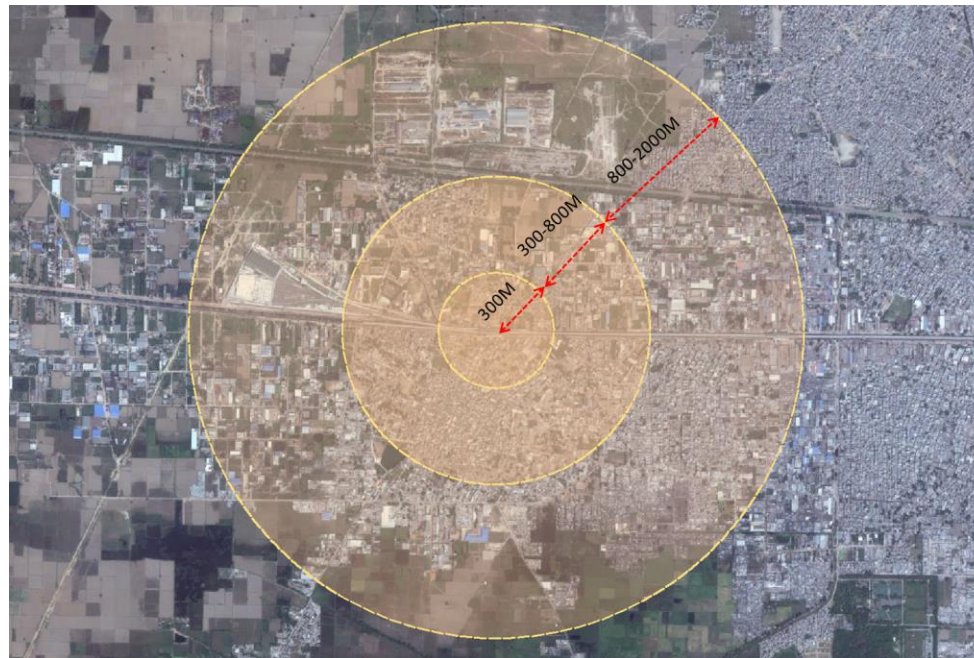
AMIT SHARMA

OBJECTIVE

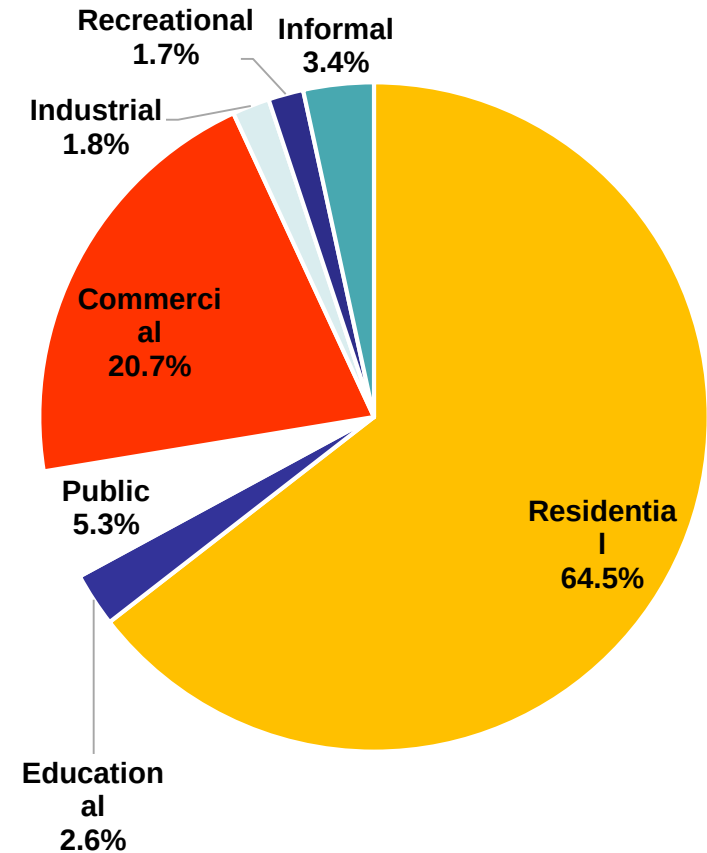
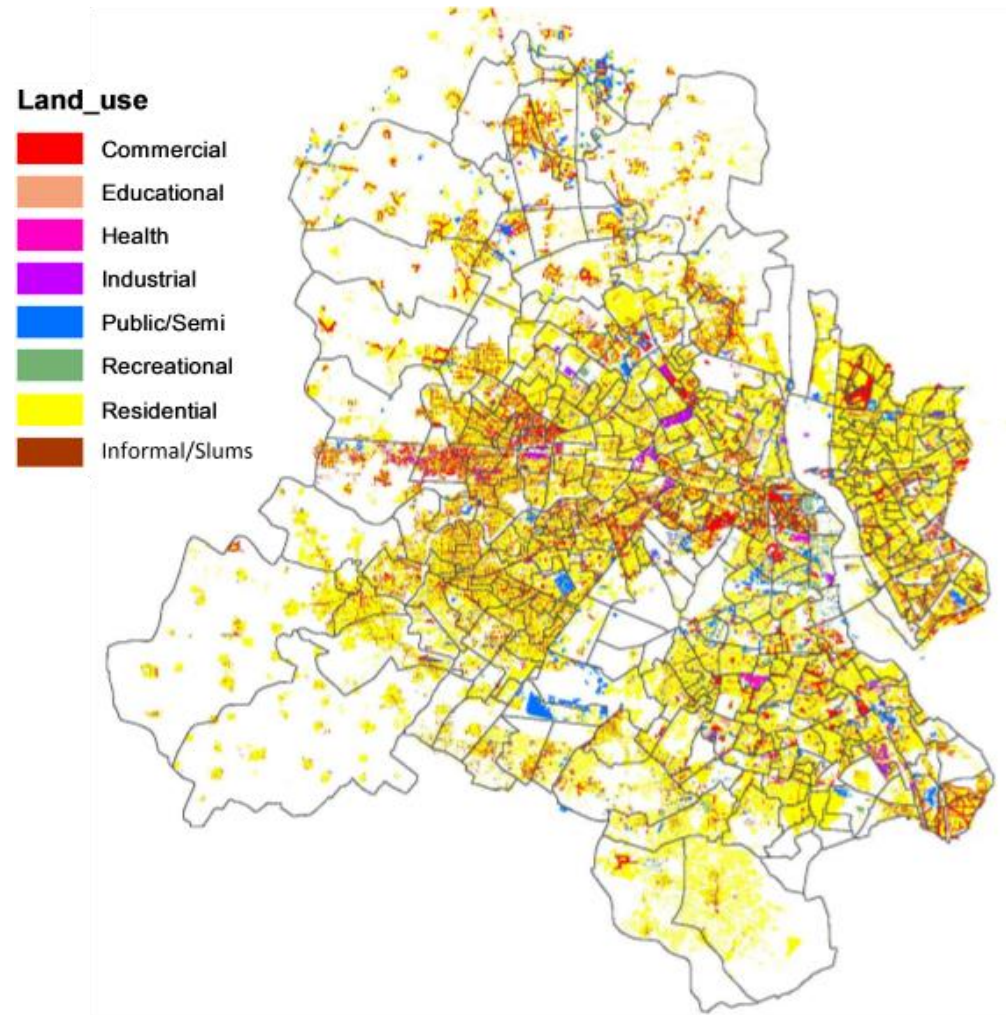
Understand the causal relationship b/w Land use and hourly ridership



STUDY AREA – RIDERSHIP & CATCHMENT



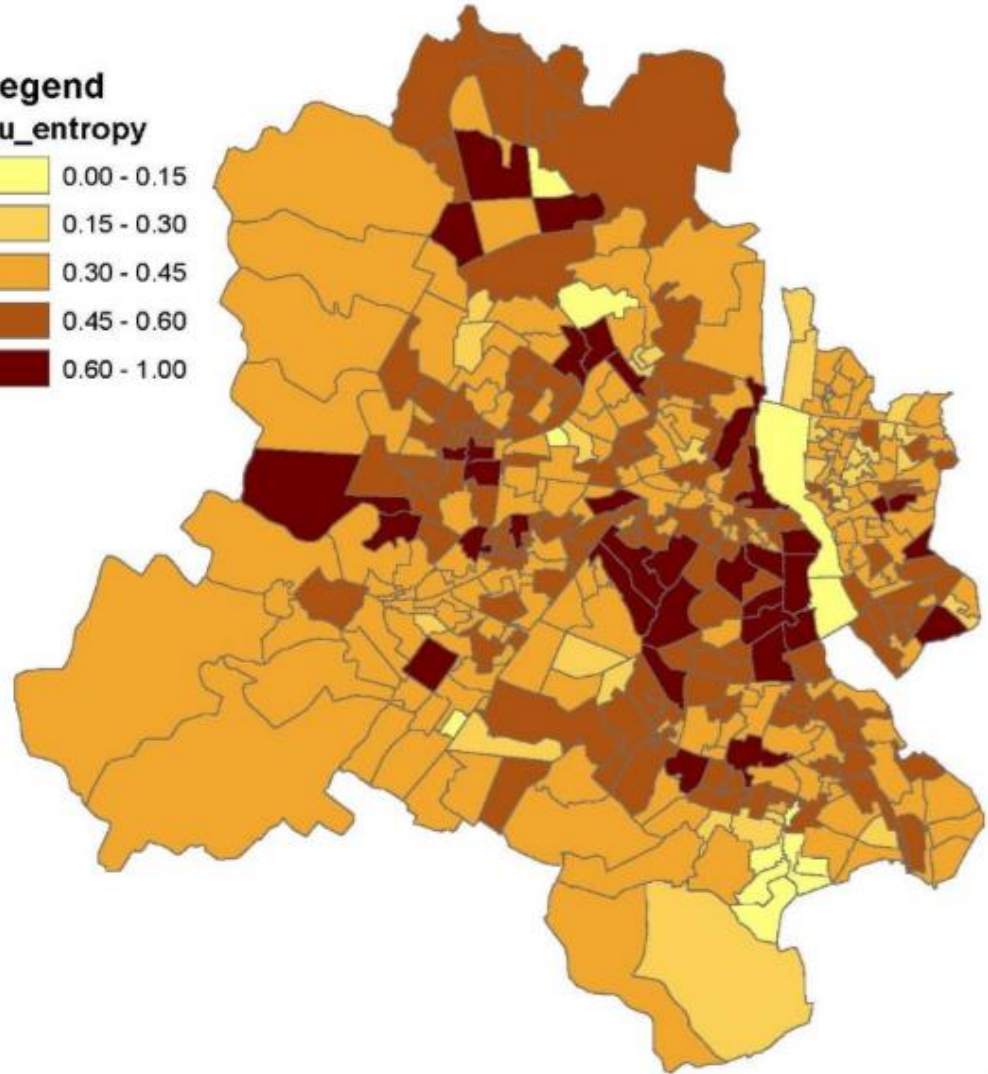
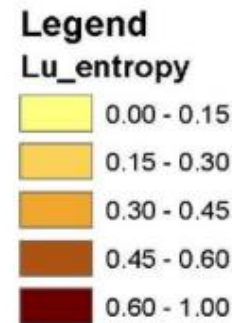
DATA - LAND USE IN DELHI (2014)



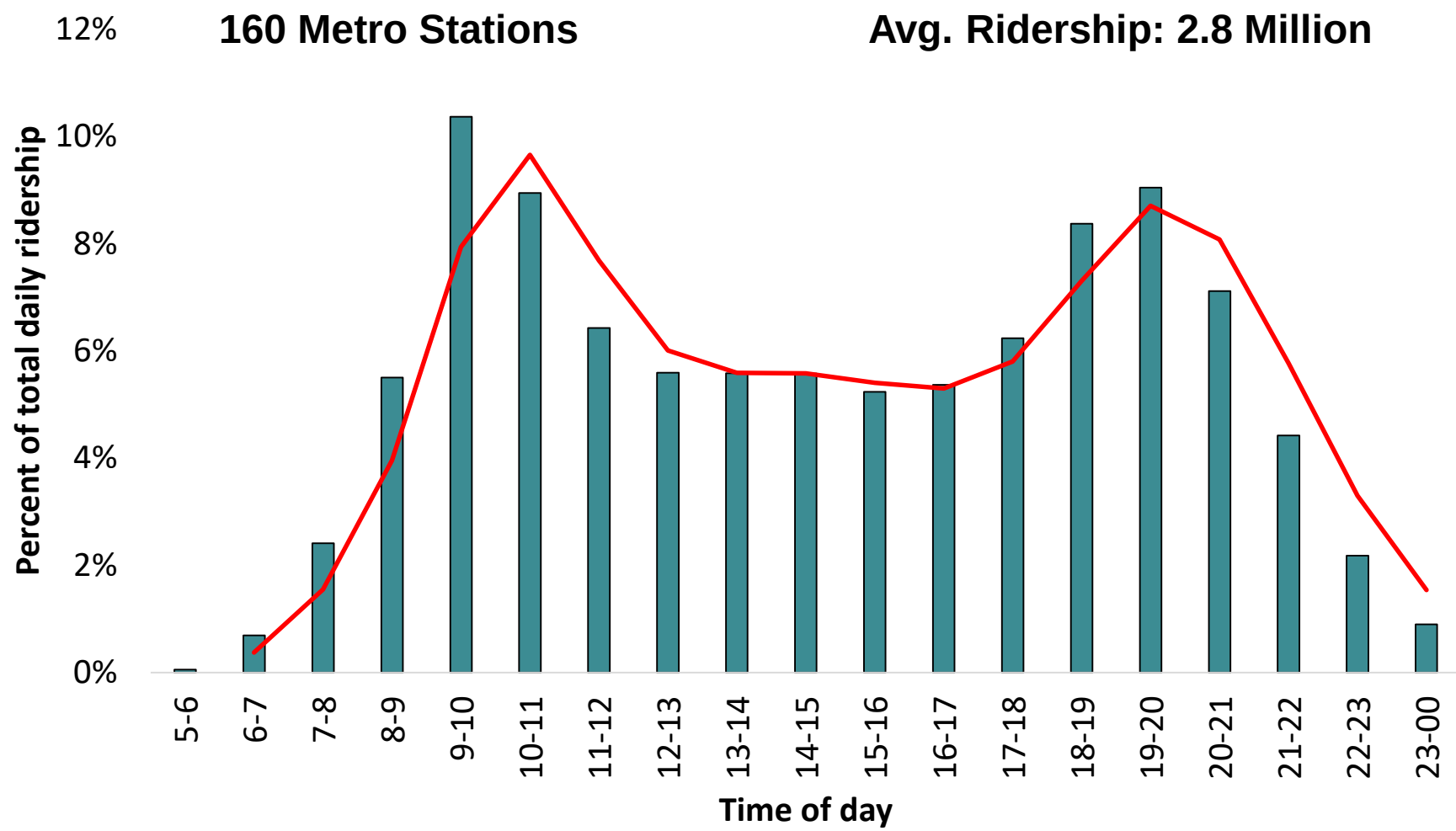
DATA- LAND USE MIX IN DELHI (2014)

$$Entropy = -\frac{1}{\ln(k)} \sum_{j=1}^k P_j \ln(P_j)$$

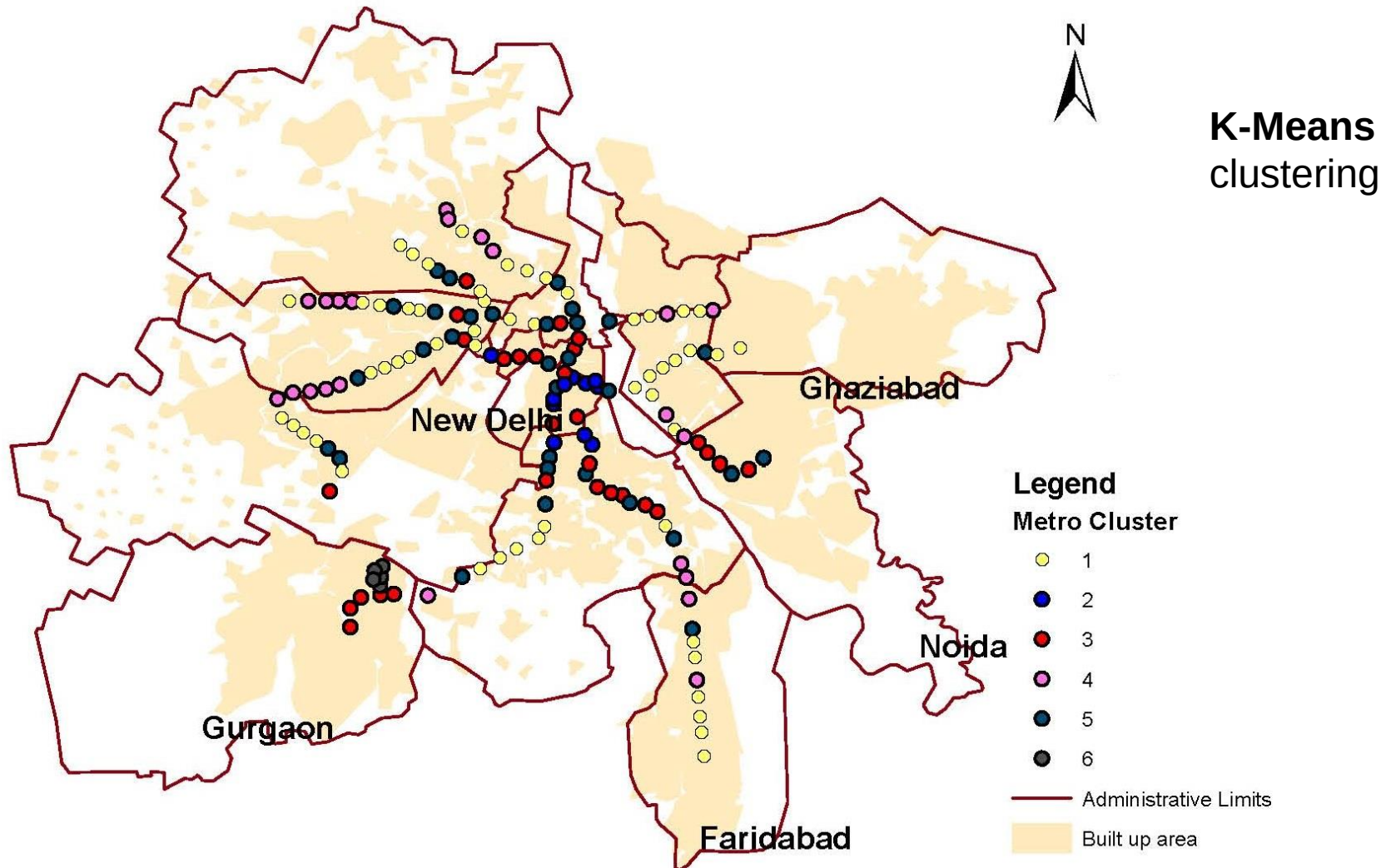
Where, j is the number of the land use types and P_j is the proportion of area of the jth land use type



DATA- RIDERSHIP/ BOARDING FOR ALL METRO STATIONS (2016)



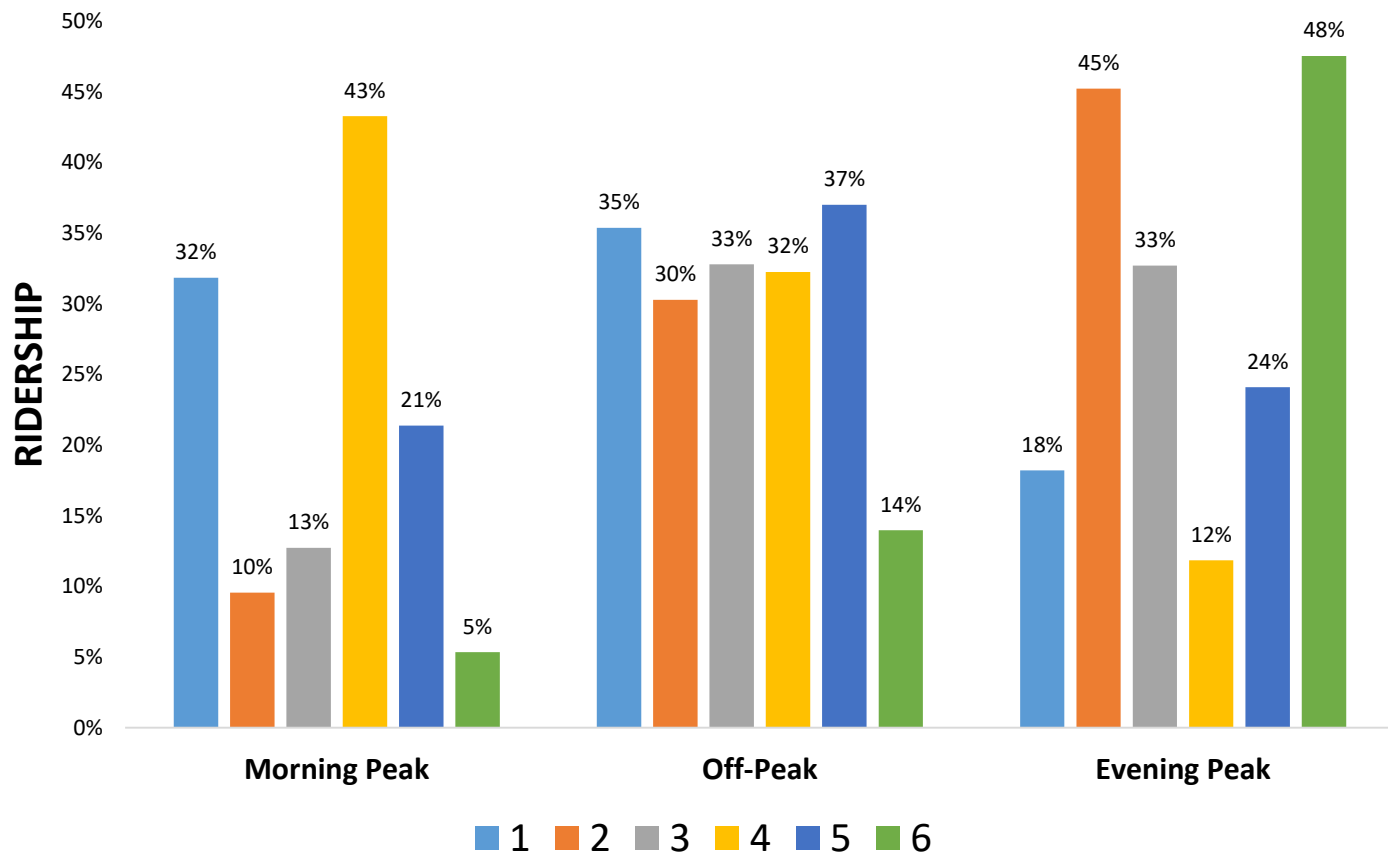
ANALYSIS- DELHI METRO STATION CLUSTERS



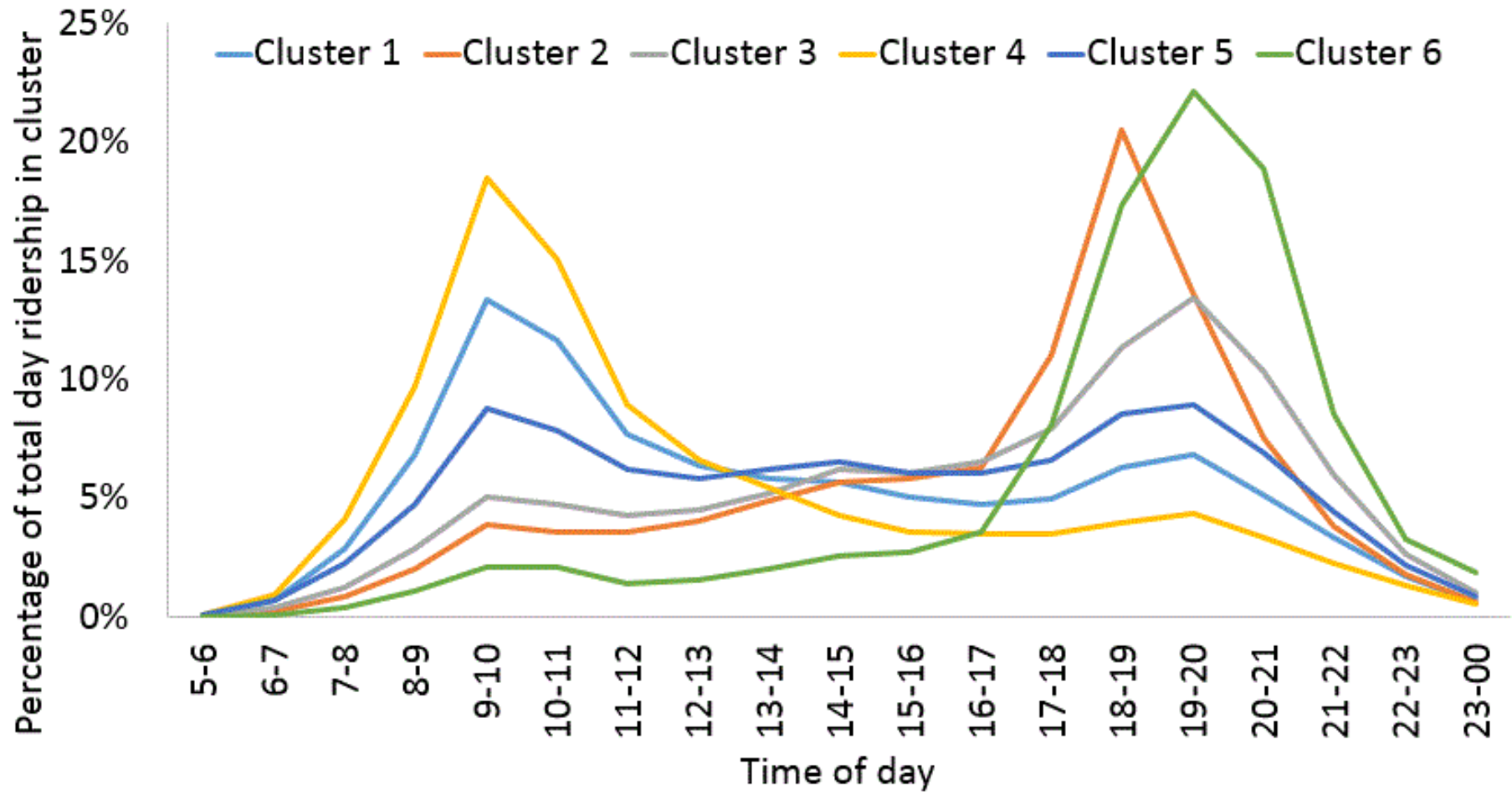
DATA- AVERAGE LAND USE DISTRIBUTION FOR EACH CLUSTER- BUFFER DISTANCE 800M

Cluster	Resi	Comm	Education	Public	Health	Industrial	Other	Entropy
1	73%	17%	2%	1%	1%	3%	2%	0.41
2	49%	19%	3%	23%	0%	0%	5%	0.59
3	60%	28%	3%	4%	1%	2%	1%	0.47
4	70%	23%	1%	2%	0%	3%	0%	0.41
5	67%	18%	4%	5%	2%	3%	3%	0.46

DATA- PASSENGER BOARDING FOR EACH CLUSTER



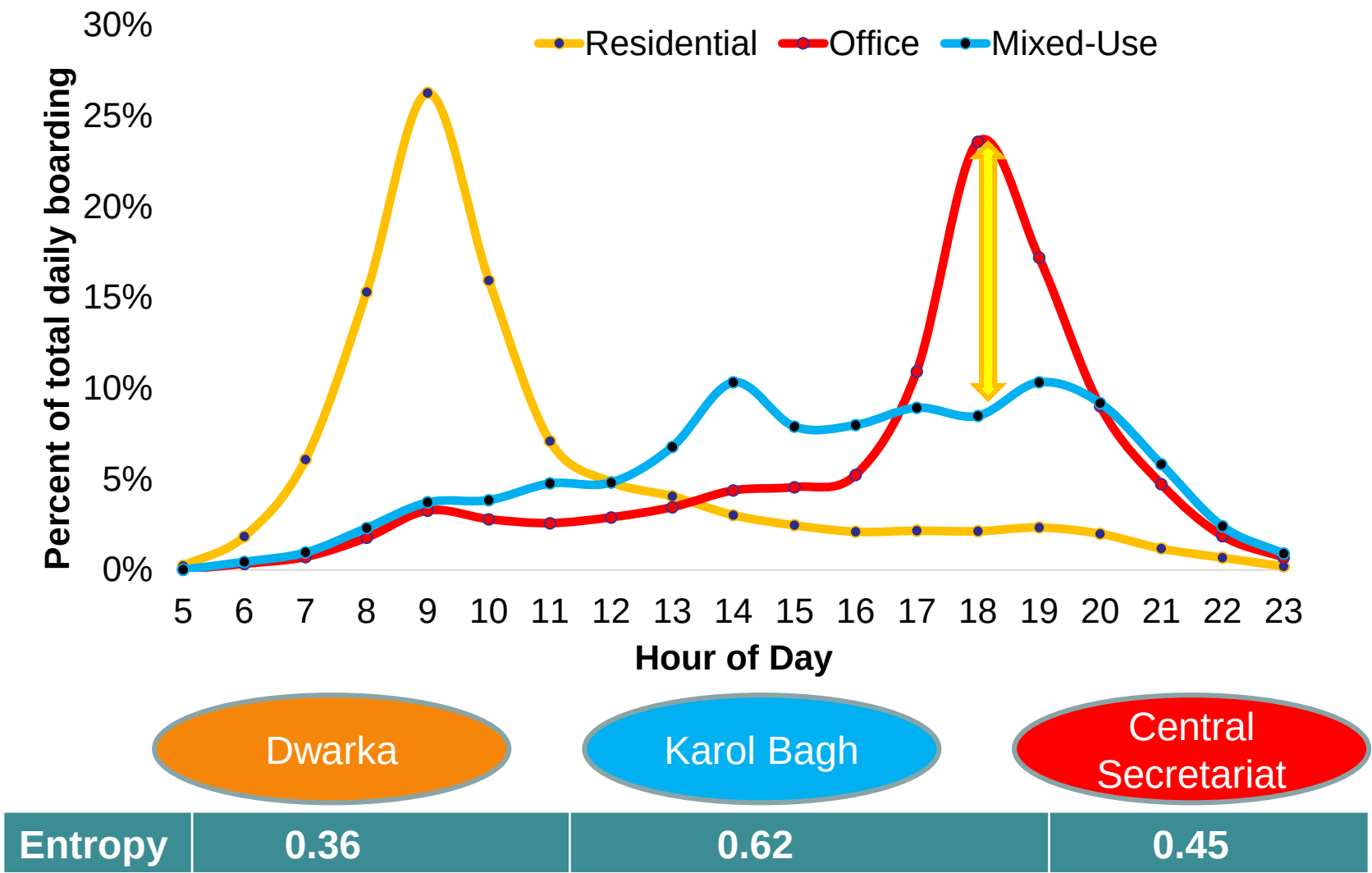
ANALYSIS- PASSENGER BOARDING FOR EACH CLUSTER



ANALYSIS- CORRELATION B/W LAND USE & HOUR SPECIFIC BOARDING

Hours	Residential	Commercial	Educational	Public/Semi-public	Health	Industrial	Other
5-6	-0.06	0.15	0.03	-0.14	-0.02	-0.03	0.12
6-7	0.05	0.07	-0.15	-0.21	-0.13	0.19	0.01
7-8	0.33	-0.07	-0.25	-0.37	-0.16	0.18	-0.14
8-9	0.42	-0.15	-0.21	-0.38	-0.13	0.09	-0.15
9-10	0.43	-0.18	-0.20	-0.39	-0.12	0.10	-0.08
10-11	0.39	-0.13	-0.21	-0.42	-0.13	0.19	-0.15
11-12	0.37	-0.12	-0.12	-0.39	-0.06	0.13	-0.19
12-13	0.35	-0.09	-0.02	-0.41	0.07	0.08	-0.24
13-14	0.16	-0.06	0.24	-0.19	0.21	-0.12	-0.14
14-15	0.03	0.00	0.44	-0.07	0.19	-0.23	-0.06
15-16	-0.12	0.02	0.38	0.06	0.19	-0.21	0.11
16-17	-0.27	0.09	0.36	0.23	0.25	-0.24	0.12
17-18	-0.44	0.06	0.22	0.61	0.14	-0.22	0.15
18-19	-0.46	0.00	0.11	0.70	0.00	-0.10	0.19
19-20	-0.37	0.12	0.05	0.38	0.03	0.00	0.12
20-21	-0.35	0.29	0.02	0.14	0.05	-0.03	0.14
21-22	-0.32	0.36	-0.04	0.04	0.06	-0.06	0.12
22-23	-0.26	0.33	-0.08	-0.03	0.04	0.02	0.06
23-24	-0.21	0.24	-0.03	-0.01	-0.01	0.10	0.01

RESULTS: SUMMARY



ACKNOWLEDGEMENTS

Prof. Rahul Goel, IIT DELHI

Prof. Geetam Tiwari, IIT DELHI

Special Thanks

MoHUA & DMRC