Various cluster approaches

Basis for Clustering	Homogeneity	Diversity
1. Spatial Distribution (Geography / Location)	**1. 1.** ***Homogenous Spatial Clustering***: All the toilets in near locations are grouped in the same cluster. This way of clustering is done considering smaller clusters at local levels and aggregating the same at zonal/city level. Subsequently, the aggregation of toilets at local levels leads to the formation of 3 zones (clusters). Different zones different concentration of toilets will lead to dispersed number of toilets per cluster.	**1.2.** ***Diversified Spatial Clustering:*** Clusters are formed to ensure cumulative distance to the nearest toilet is almost same across the clusters, helping the operator to closely monitor all the toilets in the cluster and allowing optimal deployment of manpower. Thus, operating cost of toilets is reduced. For this clustering option to work it is important to have no user fee levied for any type of toilet usage. This reduces the role of caretaker to only maintenance of toilets and one caretaker can possibly maintain multiple toilets thereby reducing the cost of operations substantially. **Note:** The municipality may need to identify alternative modes for compensating the loss from user fee revenue.
2. Revenue Potential	***2.1. High/medium/low potential cluster:*** Clustering according to revenue potential, allowing the possibility of revenue sharing from private operators for high and/or medium potential cluster and cross subsidizing low potential cluster. The current footfalls as per the inventory data and the existing user fee for various types of usage are considered. This clustering option attracts private operators and high number of bids while offering the municipality a higher share of revenue. Low potential cluster can be tendered separately with financial support from the municipality	***2.2. Similar Revenue Potential Clusters to ensure cross subsidization:*** Ensure similar extent of revenue from user fee and advertisements across clusters. However the extent of support required for each of the clusters varies as the number of toilets in each cluster is different. The municipality has the advantage in terms of treating all the clusters equally in terms of financials (same extent of support or similar payment terms from operators). The advantage is spatial distribution and cross subsidization of toilets within cluster. However, the toilets within cluster will have different operational model i.e. the frequency of cleaning, maintenance cycles, etc. Hence cost optimization is not maximized. Moreover, non-revenue toilets are likely to be neglected by the operator.
3. Extent of Rehabilitation required	***3.1 Clustering based on Extent of Renovation:*** Cluster toilets based on the extent of renovation required, as per the inventory, to help operators and municipality to know the extent of upfront support required for renovation and also on defining the terms of the contract document. a) Clustering based on cost of renovation b) Mixing up properties based on extent of renovation	
4. Value Clustering	***4.1 Clustering based on overall value:*** The cumulative cash flow for operator forms the basis for clustering. In arriving at the cumulative cash flow for the operator (cash related transactions: cost – renovation, reconstruction, operating expenses; total revenue – user fee, advertising, commercial; time period of agreement.) Clustering according to the expected cash returns (either clustered according to high, medium and low value or keeping expected returns similar in every cluster). This method assumes that all capital expenses are born by operator. a) High/Medium/Low value b) Average value across all	