

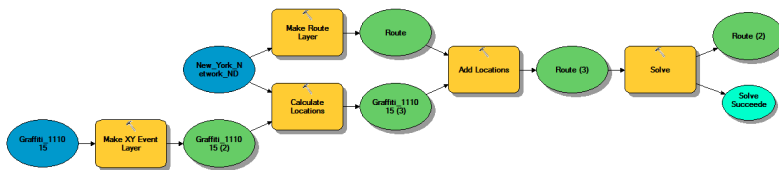
## Graffiti Grouping/Routing Project

The DSNY exports a list of graffiti spots (around 450) to be cleaned every two weeks. We are exploring possible approaches to optimizing current GIS steps that calculate efficient routes in five boroughs.



### Current Steps (using GIS):

1. Data Preparation (X/Y coordinates)
2. Network Calculation (Traveling Salesman Problem)



### Revised Steps (using Python):

```
9 # Import arcpy module
10 import arcpy
11
12 # Check out any necessary licenses
13 arcpy.CheckOutExtension("Network")
14
15
16 # Local variables:
17 New_York_Network_ID = "New_York_Network_ID"
18 Graffiti_111015 = "G:\GIS\Map\111015\Grafitti_111015.mdb\Grafitti_111015"
19 Graffiti_111015_2 = "Grafitti_111015"
20 Route = "Route"
21 Graffiti_111015_3 = "Grafitti_111015"
22 Route_3 = "Route"
23
24 # Process: Make Route Layer
25 arcpy.MakeRouteLayer_management(New_York_Network_ID, "Route", "Cost", "FIND_BEST_ORDER", "PRESERVE_NONE", "NO_TIMEINNOVATIONS", "", "ALLOW_UTURNS", "Oneway", "USE_HIERARCHY", "", "TRUE_LINES_WITH_MEASURES", "")
26
27 # Process: Make XY Event Layer
28 arcpy.MakeXYEventLayer_management(Graffiti_111015, "xcoord", "ycoord", Graffiti_111015_2, "", "")
29
30 # Process: Calculate Locations
31 arcpy.CalculateLocations_na(Graffiti_111015_2, New_York_Network_ID, "5000 Meters", "New_York_Network", "SHAPE\New_York_Network_ID_Junctions NONE", "MATCH_TO_CLOSEST", "", "", "", "", "", "Locations", "INCLUDE", "New_York_Network", "New_York_Network_ID_Junctions #")
32
33 # Process: Add Locations
34 arcpy.AddLocations_na(Route, "Stops", Graffiti_111015_3, "Name Service_Request #", "5000 Meters", "", "New_York_Network", "SHAPE\New_York_Network_ID_Junctions NONE", "MATCH_TO_CLOSEST", "APPEND", "NO_SNAP", "5 Meters", "INCLUDE", "New_York_Network", "New_York_Network_ID_Junctions #")
35
36 # Process: Solve
37 arcpy.Solve_na(Route_3, "HALT", "CONTINUE", "")
38
```

3. Manual Grouping (10 per group, separate borough spots)
4. Final Edits (rename boroughs & columns, combine address, export to excel)

**Current problems:** time-consuming, subjective grouping, inefficient network calculation

1. Data Preparation (X/Y coordinates)
2. Grouping by Boroughs (BK+SI if SI < 8)
3. \*Network as Distance (without sequence)
4. Grouping by median center/mean center/clustering/the next closest spot (10 per group)
5. Final Edits (rename and combine, export to excel/csv)