

Pedestrian Activity Around Kendall Square
Final Team Project (E3), Spring 2025.

For the final projects in 11.024/324, we have 4 different topics, one for each team:

1. Making Kendall Sq a whole-day and weekend destination for diverse users.
2. Turning Main Street into a "shared street" between Ames St and Broadway and enlivening the ground floors along its edges.
3. Envisioning the Grand Junction rail corridor and built-environment changes around the new stations.
4. Improving pedestrian connectivity and legibility between the disparate parts of the greater Kendall Square area (Main St cluster, One Kendall cluster, Lafayette Square cluster, Third St cluster, etc.)

Each team should produce materials addressing three components:

1. Urban Design / Policy / Planning proposals. What should be done in the Kendall Sq area to address your topic? Include precedent analysis from comparable projects and illustrate the bold and future oriented interventions of your project. Illustrate your proposals in both plans and perspective images along with supporting materials.
2. Analyze the impacts of your project using pedestrian modeling techniques you have learned this semester. We will hand out a calibrated model of total pedestrian flows to all teams as a basis you may want to use for your before/after project analyses (see Appendix).
3. Develop an implementation plan for your interventions—who are the key stakeholders? What actions should they take, and what challenges would they likely face? Who would likely be the opponents of your plan, why, and (how) would you try to get them on board?

Files we have prepared for your work:

[KendallFlowModelData_Calibrated.zip](#) (package of GeoJSON files with calibrated ped flow model for “before” intervention conditions. CRS 6491).

[Basefile_2025_E3_PercLength.3dm](#) (Rhino file with E3 network data, similar to E1 and E2. CRS 6491).

[Kendall CAD 2D basefile.3dm](#) (Rhino file with 2D CAD base layers for environmental features that you can modify and redraw, e.g. trees, pavement markings, bus shelters, parcels etc. CRS 6491).

[Kendall 2D layers GIS.ppkx](#) (same layers as [Kendall CAD.3dm](#), but in GIS shp formats, as a GIS layer package. CRS 6491)

[cambridge 3d GIS.zip](#) (3D GIS layers with 3D buildings for all of Cambridge. NB! CRS here is different, CRS 6492. Need to re-project to 6491 if you merge data.)

Final presentations will take place on Thursday, May 15th 2-4PM in 10-485.

Please make sure to consult [existing city plans](https://www.cambridgema.gov/GIS/gisdatadictionary) for Kendall and use the rich plan drawing and GIS resources available from the City of Cambridge as base files for your designs/plans: <https://www.cambridgema.gov/GIS/gisdatadictionary>
<https://www.cambridgema.gov/GIS/3D/citywide3dmodel>
<https://www.cambridgema.gov/GIS/3D/3ddata>
<https://www.cambridgema.gov/GIS/3D/webscenes>
 Pls also reach out to CRA for any additional information your team may need.

Appendix: A Calibrated model of pedestrian flows

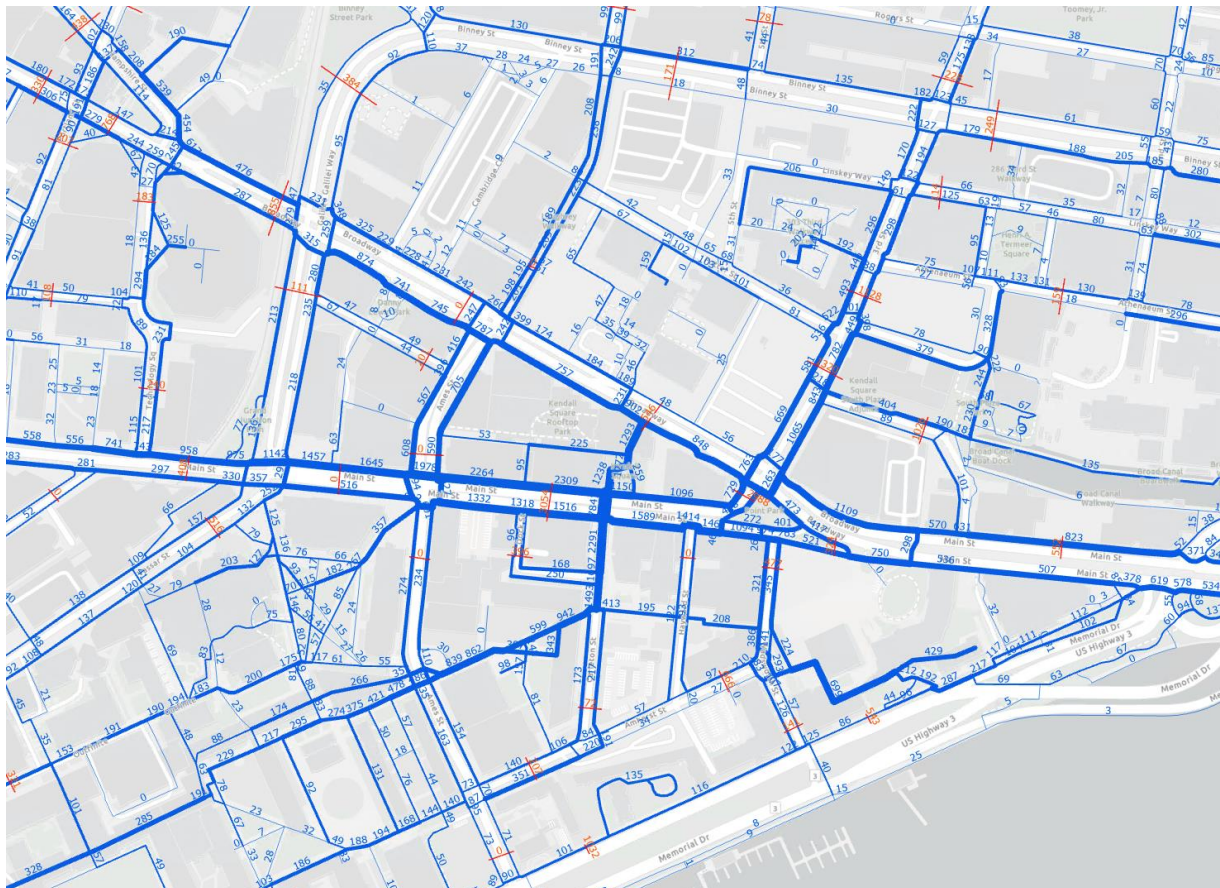


Figure 1. Total estimated pedestrian volumes around Kendall Sq during the PM peak period (5-6PM).

In the Canvas course website, Class21 Module (Apr 15, 2025), you will find the Kendall calibrated pedestrian flow model datasets under [KendallFlowModelData_Calibrated.zip](#). In this zip file, the *PMFlows_Calibrated_on2023Somerville_counts.geojson* file provides total

estimated pedestrian volumes during the PM peak period for the Kendall Square area:

The total foot-traffic estimates in this file have been calibrated on [a 2023 Somerville pedestrian activity study](#), which suggested what kinds of pedestrian trip types (O-D flows) are most common during the PM peak period, and with what trip generation rates (e.g. 14.8% of employees make a visit to an amenity, or a Job>Amenity trip). Additionally, the model calibration has also used [2018 observed pedestrian count estimates around Kendall Square](#) (see Figure 3), which were collected by students in this class in September 2018.

The calibrated model uses the following trip types and trip generation rates:

Jobs > Amenities	0.148
Homes > Bus	0.082
Homes > Subway	0.264
Jobs > Subway	0.296
Amenity > Amenity	6.4
Homes > Parks	0.109

In GIS, the calibrated model estimates “B_Calib” (corresponding to the blue labels and line weights in Figure 1), were thus calculated with the following formula based on 2025 estimated pedestrian flows around Kendall:

$$B_Calib = Jobs_Amn * 0.148 + Res_Bus * 0.082 + Res_Sub * 0.264 + Jobs_Sub * 0.296 + Amn_Amn * 6.4 + Res_Park * 0.109$$

Figure 2 illustrates the correlation between the estimated 2025 pedestrian flows around Kendall Sq, and the 2018 observed pedestrian counts at 62 count locations during the 5-6PM weekday period:

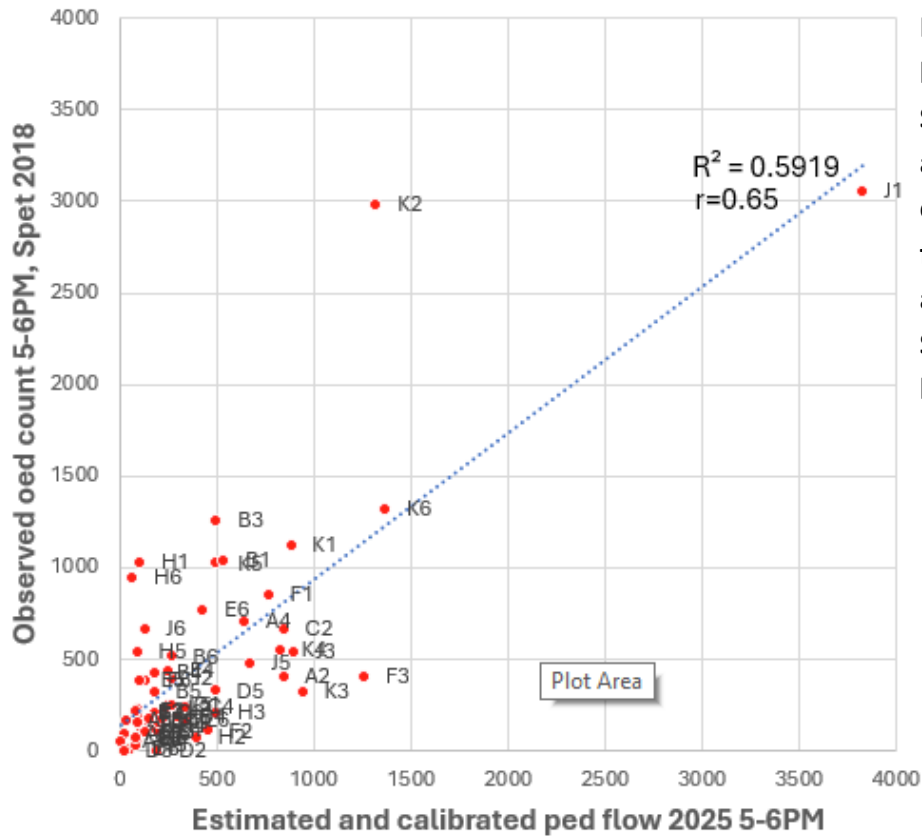


Figure 2. Correlation between actual (2018 September, 5-6PM) and estimated and calibrated (2025) foot-traffic on streets around Kendall Square. n=62 count locations.

The 2025 pedestrian flow estimates for each of these trip types (e.g. Jobs_Amn; Res_Bus etc.) are also shown in the *PMFlows_Calibrated_on2023Somerville_counts.geojson* file, and the origin, destination and network layers used to estimate these 2025 pedestrian flows are given as GeoJSON files under Canvas Module 21 (Apr 15, 2025), along with the pairing.csv table that shows the estimation parameter specifications.

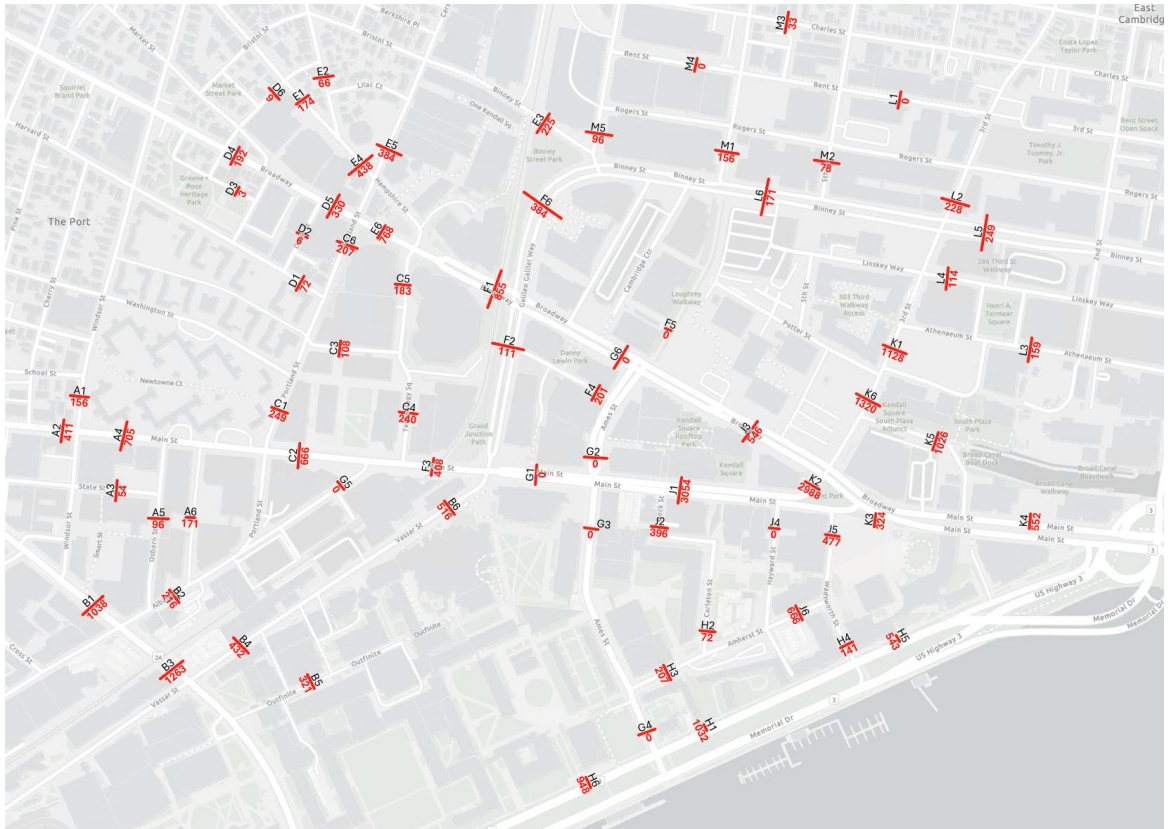


Figure 3. Observed pedestrian counts (n=62) during the PM peak period (5-6PM) in September 2018 around Kendall Square. Each line represents total pedestrian movements observed traversing the screen-line in either direction. Original counts were observed for 20min between 5pm and 7pm, the values on the map have been multiplied by 3 to approximate hourly counts.

How to use this model for team projects?

You can optionally make use of this model to examine how your interventions could affect total evening peak hour foot-traffic around Kendall Sq. The given model estimates provide a “before interventions” scenario. You can estimate an “after interventions” scenario by modifying the input GeoJSON layers so that they reflect the built environment changes that your team proposes:

- New Destinations (e.g. new transit stations, businesses, institutions, buildings, parks etc.) .
- New Origins (new residential, office, academic, lab, etc. buildings, or stations where trips may start from).

- Street quality improvements, that can be reflected as changes in network attributes by redefining the “PerLen” values in the network.geojson file.
- Street network changes (new segments added, segments removed or changed. With any network geometry changes, be sure to add a PerLen attribute to each changed segment, which can either be the same as the geometric length of the segment, or purposefully different to reflect quality segment qualities).

Note that while the use of this model can be effective to show how your built environment interventions may affect walking trips in the Kendall Square area, doing so is optional. You can also resort to other analytic approaches to demonstrate how your proposed interventions would affect pedestrian activity around Kendall, based on skills and tools you have now obtained from the course.

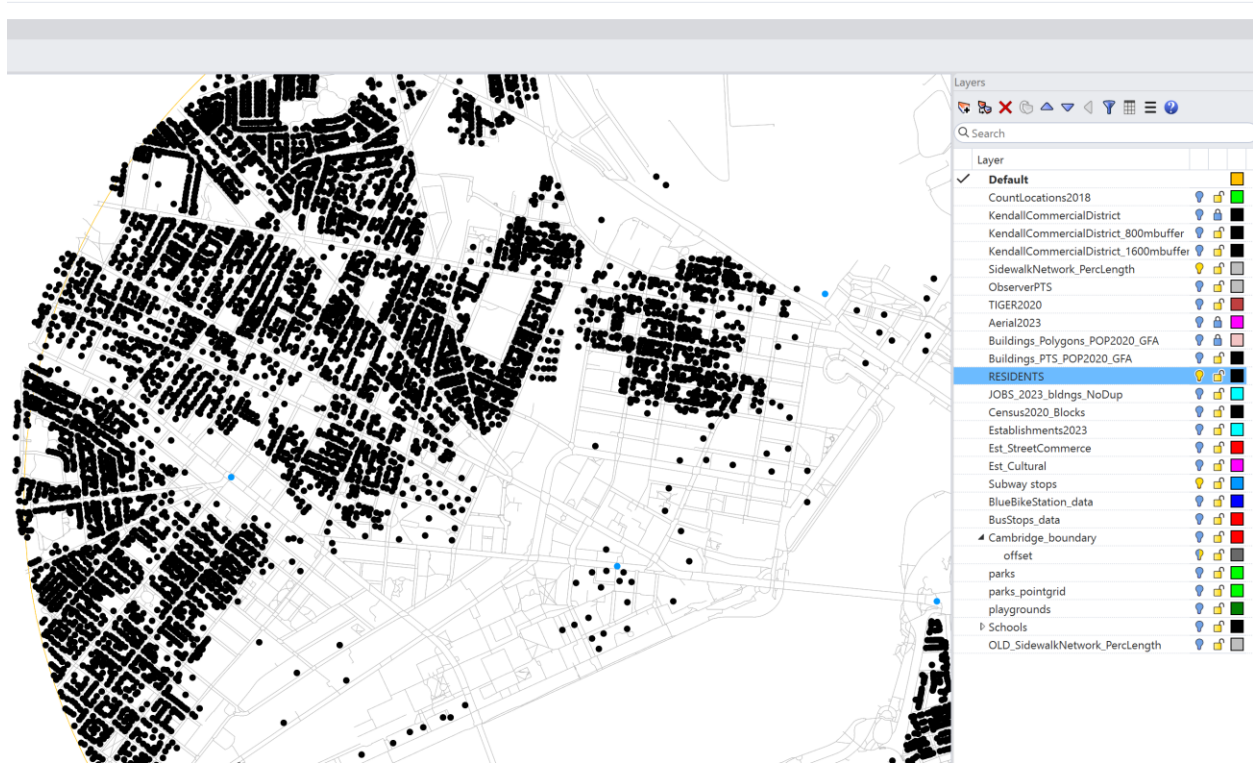
Appendix B: Datasets provided.

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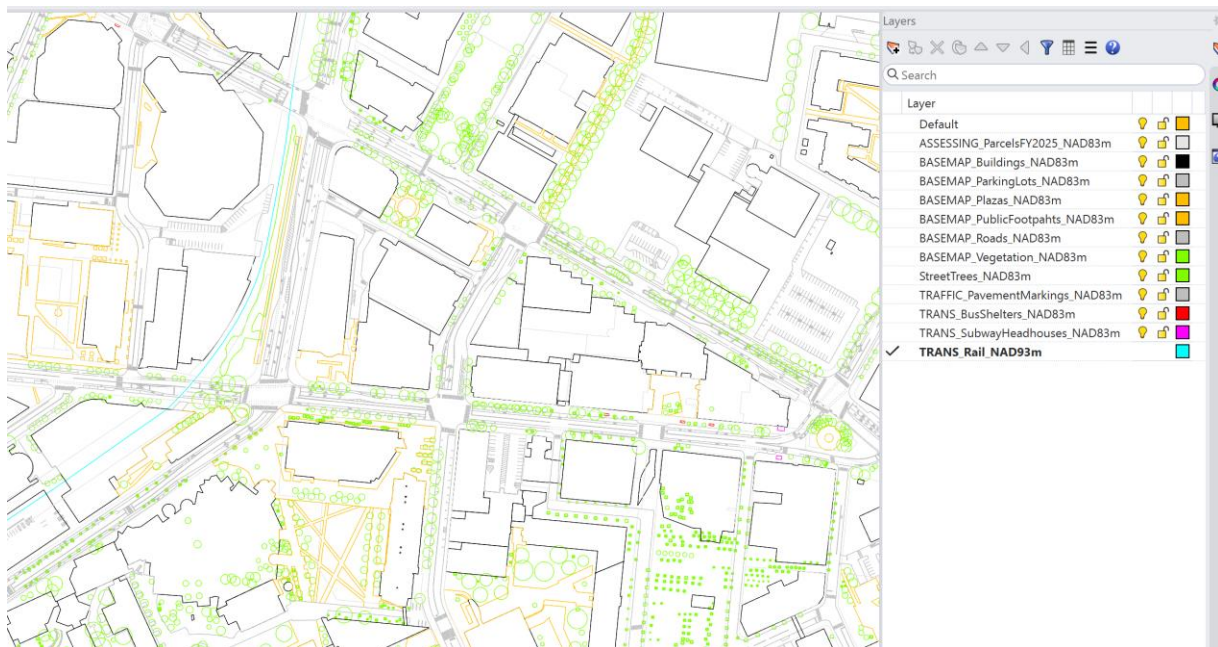
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BusStops.geojson	4/6/2025 10:27 AM	GEOJSON File	37 KB
EstCultural.geojson	4/6/2025 10:30 AM	GEOJSON File	16 KB
Jobs.geojson	4/6/2025 10:21 AM	GEOJSON File	601 KB
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Residents.geojson	4/6/2025 1:59 PM	GEOJSON File	2,026 KB
Schools.geojson	4/5/2025 1:17 PM	GEOJSON File	16 KB
StreetCommerce.geojson	4/9/2025 10:24 AM	GEOJSON File	3,646 KB
Subway.geojson	4/5/2025 1:16 PM	GEOJSON File	2 KB

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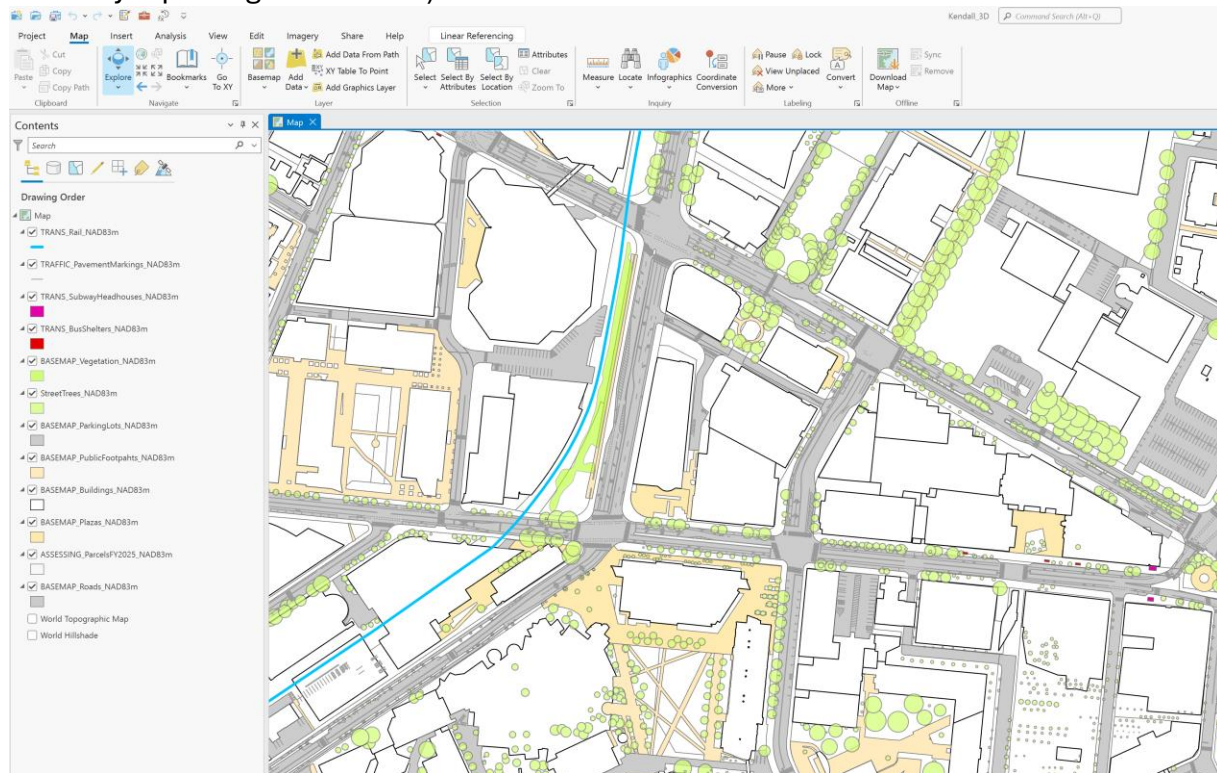
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