

## Evaluating access to jobs via transit from disparate neighborhoods

### **Objective**

Design and conduct a geospatial analytical method for comparing different neighborhoods in terms of the number of low-paying jobs that are easily accessible by public transit from each neighborhood.

### **Background**

The Green Corridors project is a U.S. Housing and Urban Development (HUD) funded project lead by Dr. Elizabeth Mueller of the Community and Regional Planning department at the University of Texas at Austin. The project's objective is to design and conduct a replicable methodology that planners and advocates can use to evaluate threats from development to affordable housing and opportunities for protecting affordable housing in their cities. As Dr. Mueller's graduate research assistant, I am helping to design a rubric for comparing, across many criteria, "activity corridors" in different parts of the city. One criterion by which we would like to compare the corridors is transit access to jobs for low-income residents of each respective corridor. We have struggled to develop a method that is sufficiently precise, accurate, and consistent, but we have not yet tried a geospatial analytical approach. This final project for GISWR presents an opportunity to develop a geospatial analytical method through an iterative and exploratory process. If successful, this work will be included in the final publications and other products associated with the Green Corridors grant. It will also be used in local advocacy and policymaking.

### **Research Questions**

1. What is the relative accessibility by transit to low-income jobs from each of the eight study corridors in Austin?
2. Is there a geospatial analytical method for estimating job accessibility that can be applied in Austin and in other cities?

## Update

As I have switched to this project topic this week, most of the work represented in the update—except for the maps—was done prior to my adopting this project for GISWR. I created the maps, however, specifically for this update.<sup>1</sup>

Map 1 shows the boundaries of the eight study corridors. Map 2 shows these boundaries with the CapMetro transit routes and stops laid over them. Map 3 is a screen shot from OnTheMap.ces.census.gov, the map-based data portal from the census borough. An explanation of its origin and original purpose follow:

Using OnTheMap, I created a city-wide map that shows the concentrations of jobs paying between \$1251 and \$3333 monthly (approximately \$15,000 and \$40,000 annually). From this map, Dr. Elizabeth Mueller and I defined six “job hubs.” We took care to select six hubs that were somewhat spatially distributed across the city. At each hub, a circle defined by a 1-mile diameter was selected, and a count of all jobs below \$40K within the circle was taken. For each hub, the center of the circle was located at a centrally-located bus stop.

The table below shows the number of full-time jobs within the selected circle that pay less than \$40,000 annually. The bus stop which marks the center of the circle is given in parentheses.

I have not yet determined if I will use this job-hub approach for the analysis now that I am availing myself of the power of GIS. Before bringing GIS into the analysis, job-hubs was a convenient way to measure accessibility to jobs, because it allowed us to measure a finite number of trips (from each corridor to each job hub). With GIS, we could use a more complete map of job locations. My boss is at a conference this weekend, but I have emailed her about this and I am awaiting her reply.

A similar question presents itself about the trip-start locations, thanks again to the analytical power available with GIS. Whereas in our previous methodology we had been calculating trip-starts from a central

### JOB HUBS

<b>UT Campus</b> 21,953 (San Jacinto and 20th)
<b>The Triangle</b> 10,132 Jobs (Lamar and 45th)
<b>North Burnet</b> 2,940 (Jollyville and Braker)
<b>South Lamar</b> at HWY 71 2,554 (Western Trails and Frontier)
<b>HWY71 - IH-35 Interchange</b> 2,539 (Ben White and Woodward)
<b>Downtown</b> 39,986 (Congress and 8th)

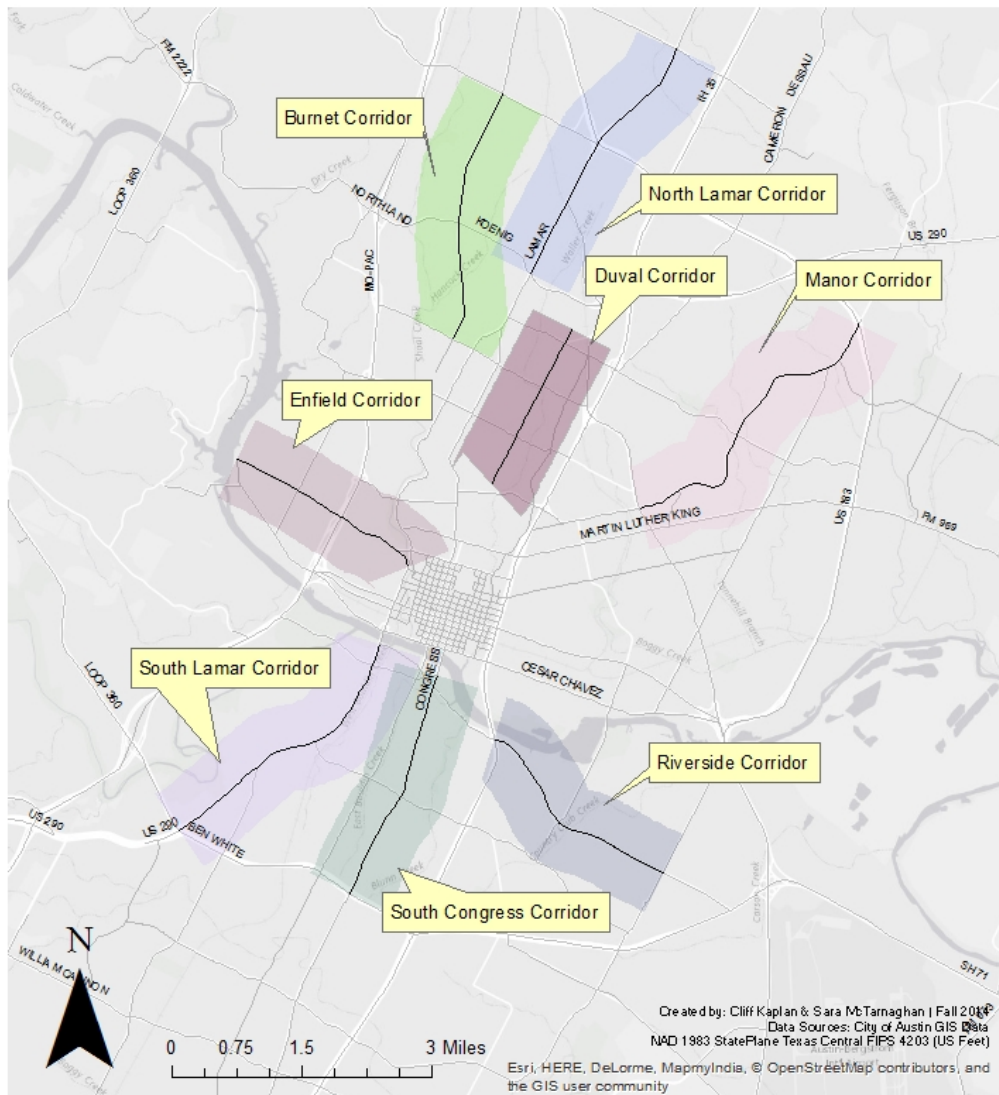
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<sup>1</sup> I should note, however, that a central feature class of these maps, the study areas themselves, were created by my colleague Sara McTarnaghan according to specifications that she, Dr. Elizabeth Mueller, and I developed together. Therefore, I have included Sara as a coauthor of these maps. As the project progresses, these boundaries will cease to be the expositive focus of the maps I produce. I will be the sole author of the maps and I will site Sara as a source of data.

intersection within each corridor, now we can conceivably use trip-starts at the actual locations of extant affordable housing within each corridor. Once again, I have a question into my boss regarding the desirability of using the actual extant housing as inputs, instead of an abstracted centrally located point. If we decide to use the extant affordable housing stock as inputs, I will have to geocode some of it. I have already geocoded some of the affordable housing stock, as has my colleague Sara McTarnaghan, but there is still a class of large affordable housing buildings that needs to be geocoded to include in a potential analysis.

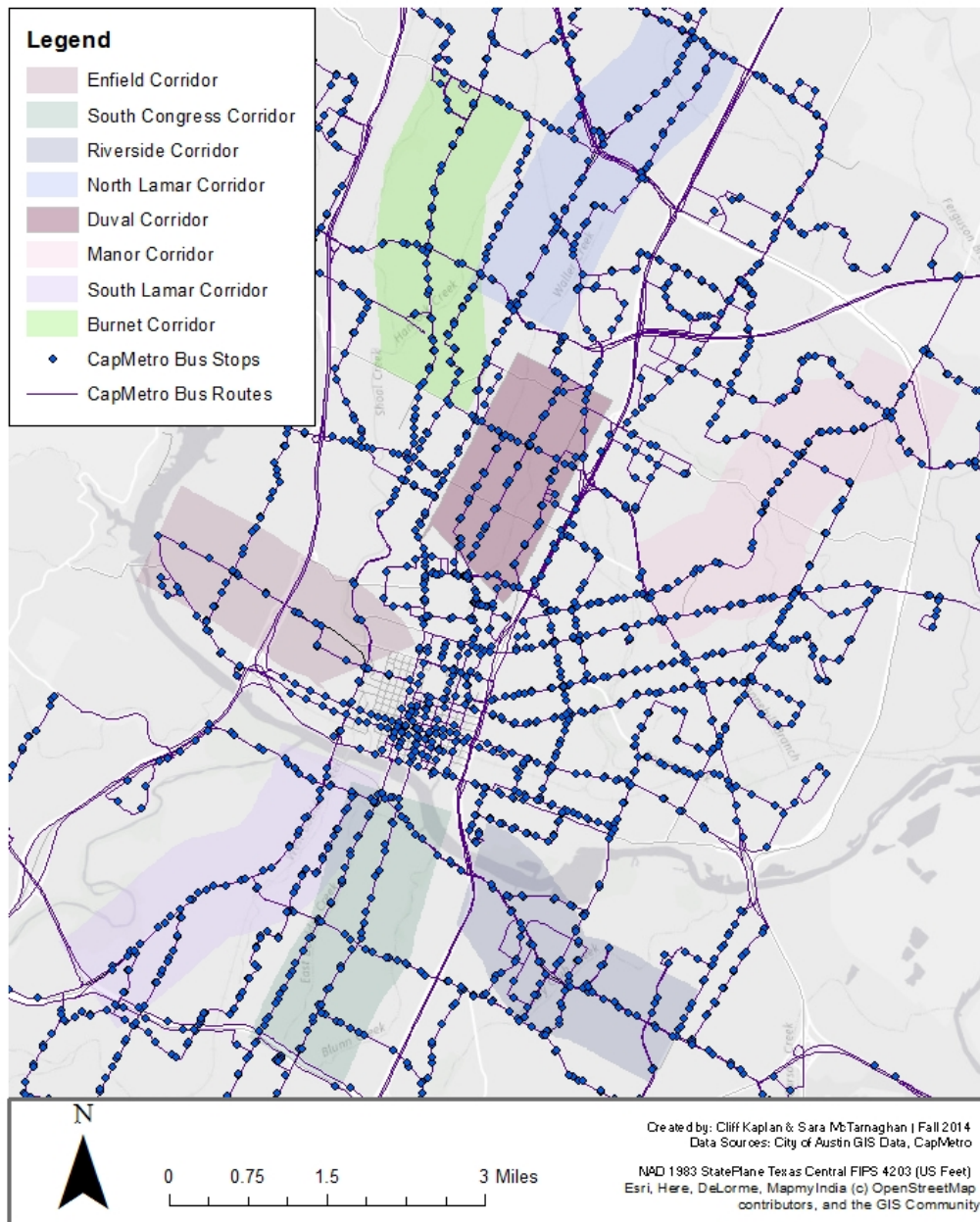
MAP 1:

### The Eight Study Corridors



MAP 2:

## Study Corridors with Bus Stops and Routes





MAP3: Relative job density across Austin (screenshot from OntheMap.ces.census.gov)

