PROGRESS REPORT

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Introduction

The ecological and economic value of an urban tree canopy can be undervalued in industrializing cities. The City of Austin's Urban Forestry Program is dedicated to the maintenance and protection of the urban canopy in the city; they are interested in the total amount of tree coverage available around town to help develop plans for future projects. Austin Urban Trails (AUT) team will perform an analysis on the canopy coverage over the bike trails and the creeks that fall within the city limits and develop a shade index that corresponds to the amount of available shade provided to the focus features. This progress report will include the previous work performed, the current work in progress, final work that needs to be completed, and a list of obstacles that have been encountered. The team will provide an overall assessment of the projects steps to reach the current status.

Purpose

The purpose of this study is to help the Urban Forest Program meet their goals as presented in the comprehensive plan for the city. The objective is to analyze the shade distribution over the trails and creeks in Austin to create an index with the amount of shade available in those areas. This can also be used for future evaluations and planting projects and to develop future plans of green corridors for alternative transportation.

Scope

The study region is within the city limits of Austin, Texas; we did exclude the incorporated cities that are in the city limits. The project will study will analyze the available tree canopy coverage for the trails and creeks across the city and will also focus on the relationship with neighborhoods, watersheds, and parks. This analysis will be performed over a three month period, from September to December 2011.

DATA

File	Layer Name	Description	Scale	Source	Date	Type
City of Austin	City Limits	Travis county city limits		CAPCOG*	2011	polygon
	ACL	Austin City Limit		Austin Urban Trails	2011	polygon
City Parks	Parks	Austin Parks		COA** GIS Data Sets	2011	polygon
	X_Parks	Parks intersection with ACL		Austin Urban Trails	2011	polygon
City Trails	Trails	Austin Trails		COAGIS Data Sets	2010	line
	Trails_ACL	Trails intersection with ACL		Austin Urban Trails	2011	line
	Trails_ACL_buffer	Trails_ACL flat buffer		Austin Urban Trails	2011	polyline
Watershed	Watersheds	Austin watersheds		COAGIS Data Sets		polygon
	X_W_ACL	Watershed intersection with ACL		Austin Urban Trails	2011	polygon
City Creeks	Creeks	Austin Creeks		COAGIS Data Sets	2010	Polygon
	Creeks_ACL	Creeks clipped to ACL		Austin Urban Trails	2011	Polygon
	Creeks_ACL_Buffer	Creeks_ACL flat buffer		Austin Urban Trails	2011	Polygon
City neighborhood	Neighborhood	City of Austin neighborhood		Clients		polygon
	X_N_ACL	Neighborhood intersection with ACL		Austin Urban Trails	2011	polygon
GIS data-COA	Canopy			Clients	2006	Polygon

*(CAPCOG) Capital Area Planning Council of Governments

** (COA) City of Austin

Work Completed

Originally, we had proposed to create a 20ft buffer for the canopy layer to determine the amount of area that provides shade for the trails. Also we mentioned that our study area would encompass Austin and the surrounding Extra Territorial Jurisdiction. Our trails were determined to be divided into smaller 200ft segments by using an available grid.

After presenting the proposal to the client, together we have decided not to move forward with buffering the canopy because of the limited processing power available and the timeline given. We have discussed these issues in detail with Tom Hayes an Austin Urban Forestry representative and verified the new course direction for the project. Therefore we have decided to create a 20ft buffer around the trails and overlay the canopy to determine how much shade the trail contains. We have also decided not to extend the study area out to the Extra Territorial Jurisdiction as the boundary because of a lack of complete data for that area. Instead, we will focus only on the areas in the city limits of Austin. The division of the trails will no longer be divided up with the 200ft grid because it does not equally divide the segments; we have downloaded X-Tools software to help equally divide the trails. Along with the changes that were made, the scope of the project increased with the addition of the creeks for analysis.

We have collected all the necessary data to perform the analysis. The initial steps have been taken to determine the data is suitable for analysis and we have performed the following procedures:

1) Selected Austin from CAPCOG city limits layer (Image 1.)
2) Clipped the Trails and Creeks to city limits (Image 2a-2b.)
3) Buffered the clipped Trails and Creeks with a 20ft radius (Image 3a-3b.)
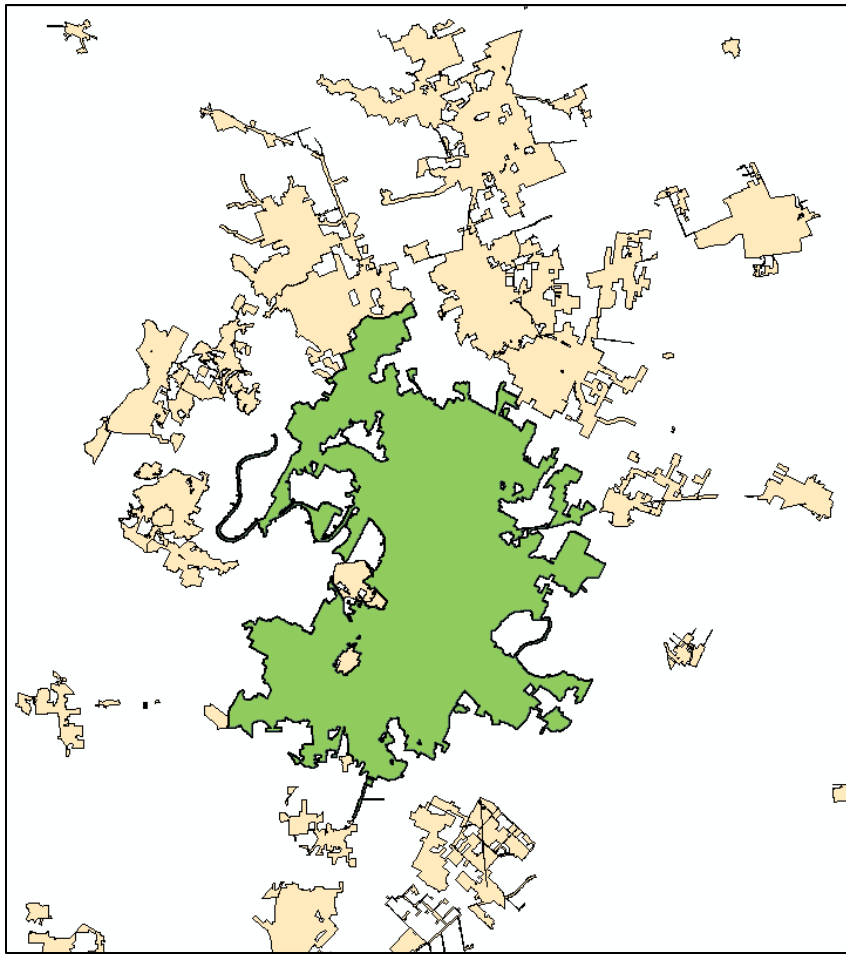4) Intersected Neighborhoods, Watersheds, and Parks with city limits (Image 4a, 4b & 4c.)
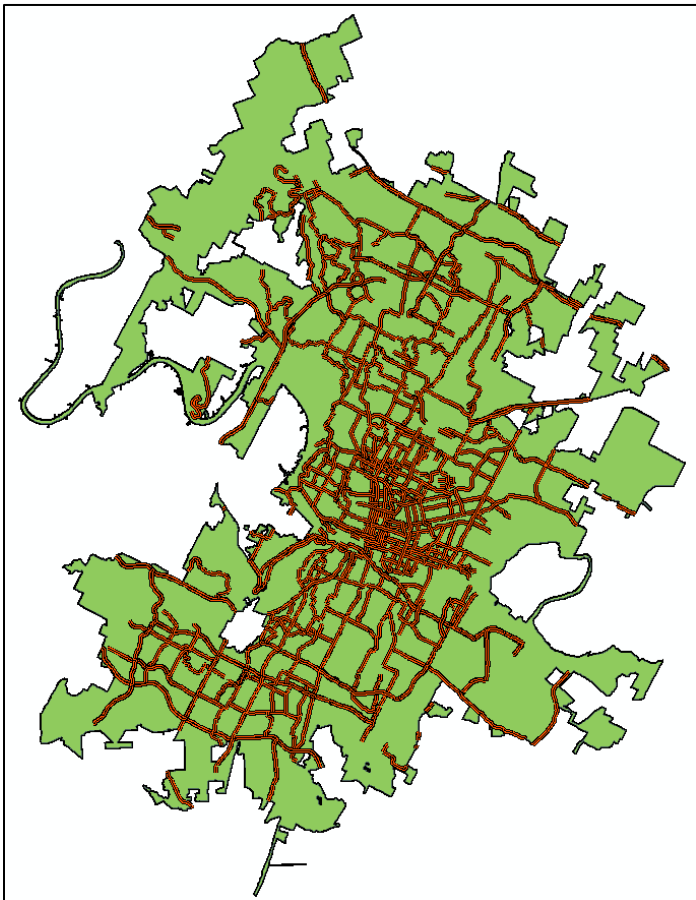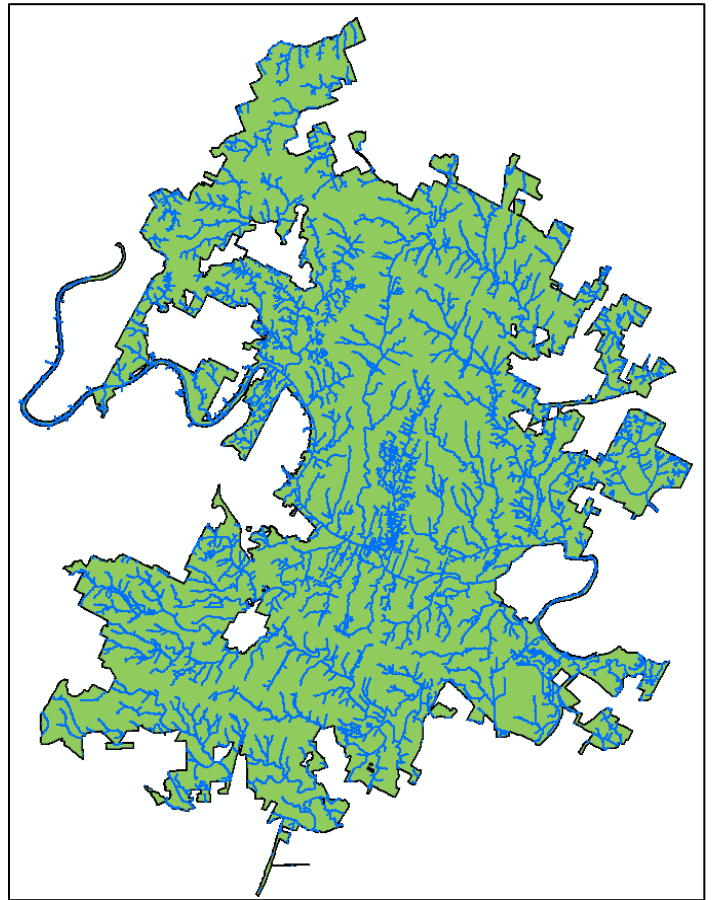
Figure 1- City Limit of Austin
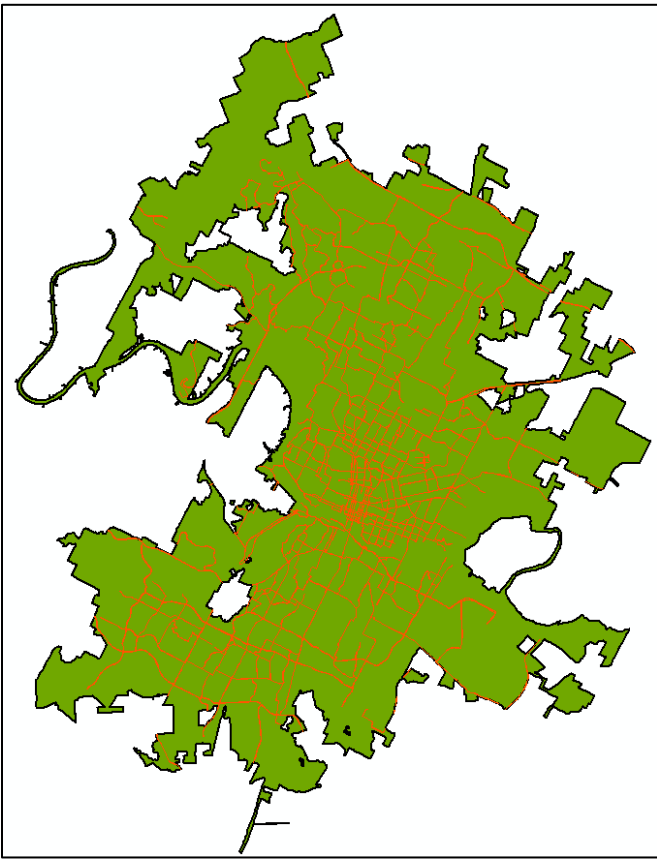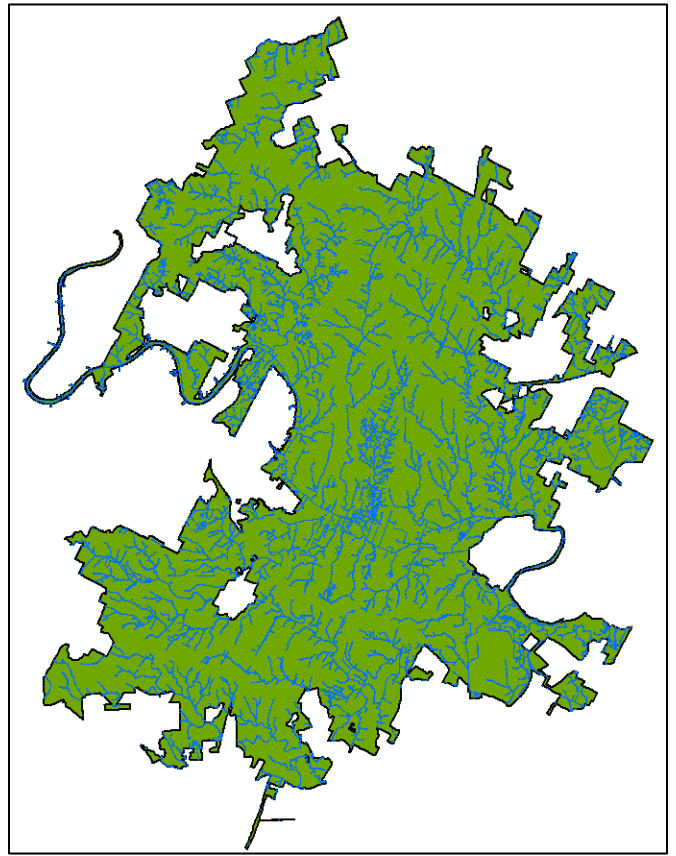

Figure 2a- Trails

Figure 2b- Creeks

Image 3a- Buffered Trails
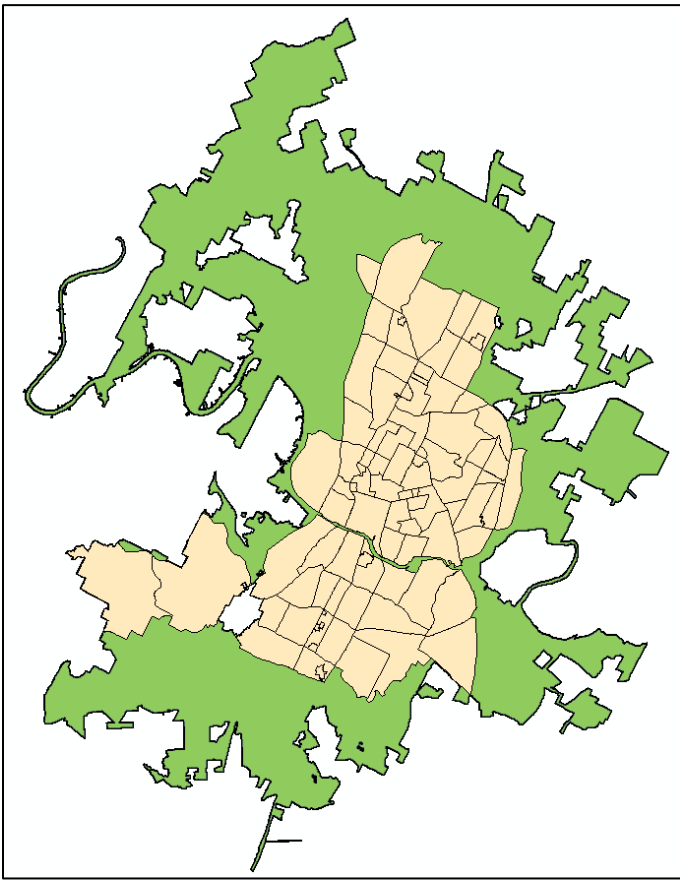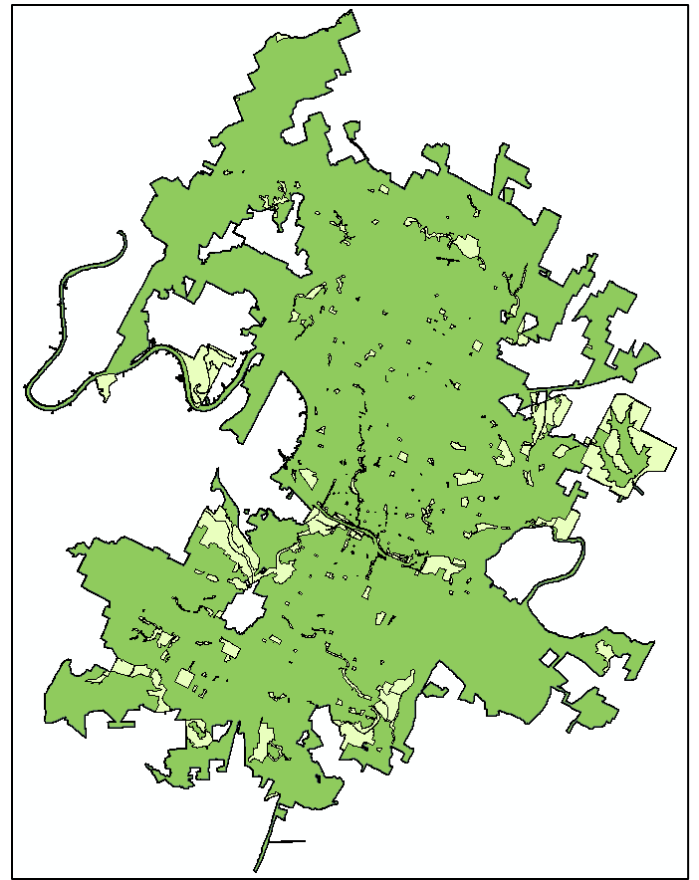
Image 3b- Buffered Creeks
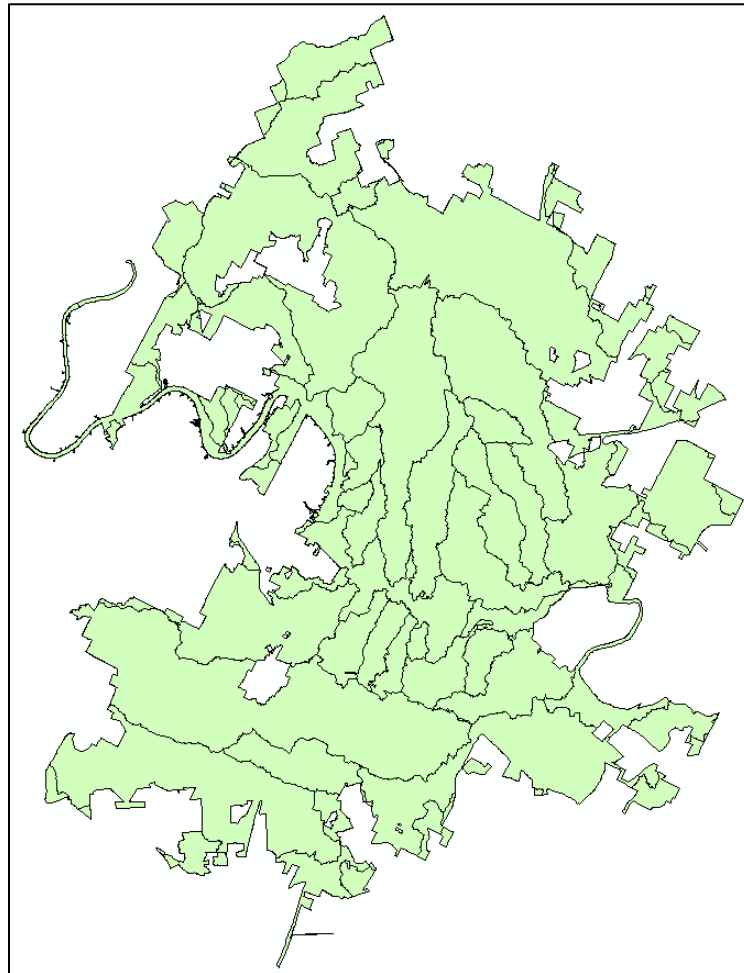
Image 4a- Neighborhood

Image 4b- Parks

Image 4c- Watershed

Work in Progress

The work that is currently under progress involves dividing the trails into equal lengths and determining the method to segment the creeks. The original trails layer provided is not evenly divided into equal lengths, some are a few feet long while others are hundreds of feet in length displayed in (Image 5). Therefore our current efforts are to determine how to divide up the trails into equal distances of one eighth of a mile by using the X-Tools software. The X-tools is a comprehensive set of useful vector spatial analysis, shape conversion, and table management tools. The function we will be using is labeled as convert features to equidistant points in fixed interval. The trails were separated into equal lengths of $1/8^{th}$ of a mile (660ft). All the trails do not divide up equally by $1/8^{th}$ of a mile; therefore there is a remainder (Refer Image 6 & 7). Another piece of the project that is currently being worked on is to clip the buffered creeks from the canopy layer, to display the amount of shade that fall on the creeks. One other necessary step is to determine how to divide the creeks to create the shade index.
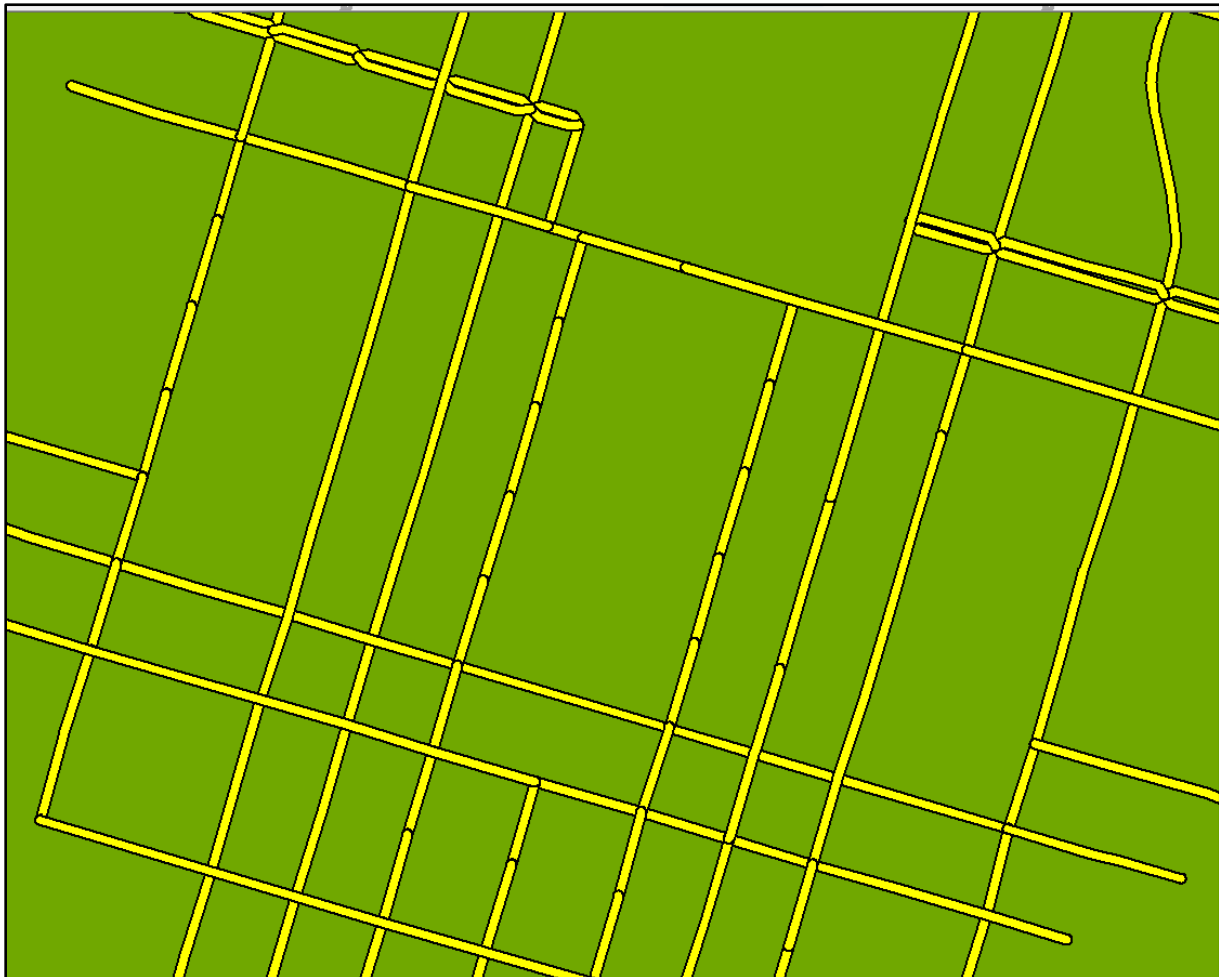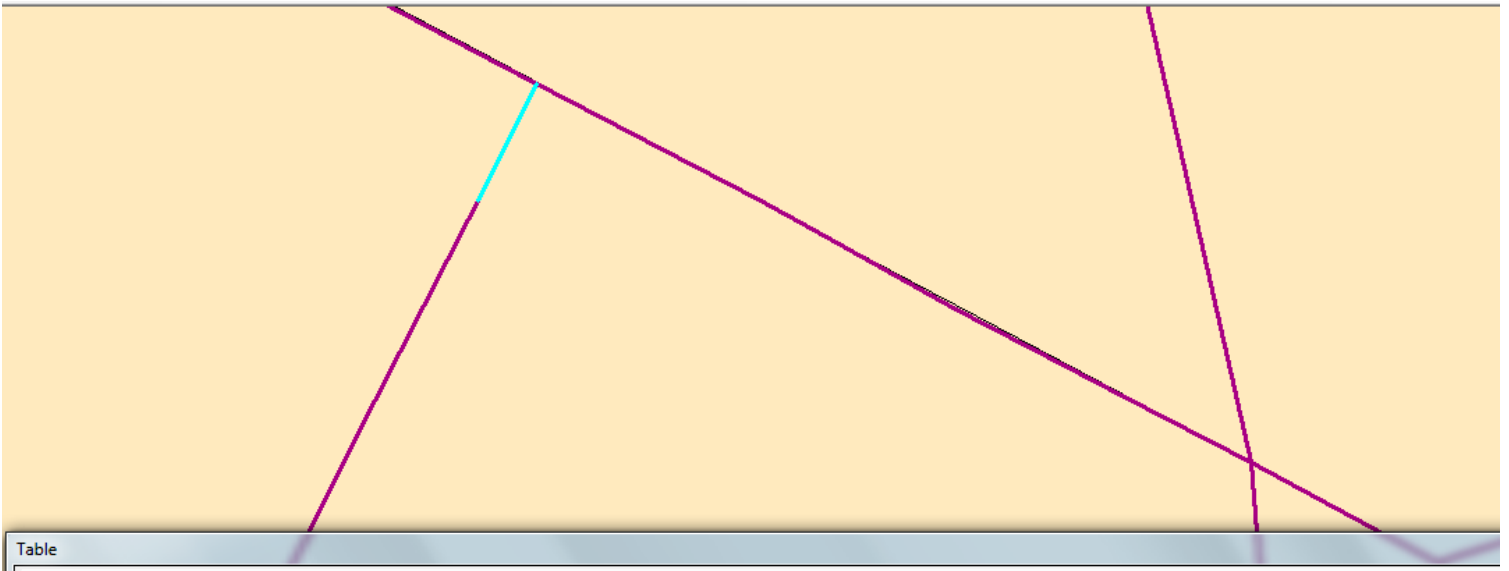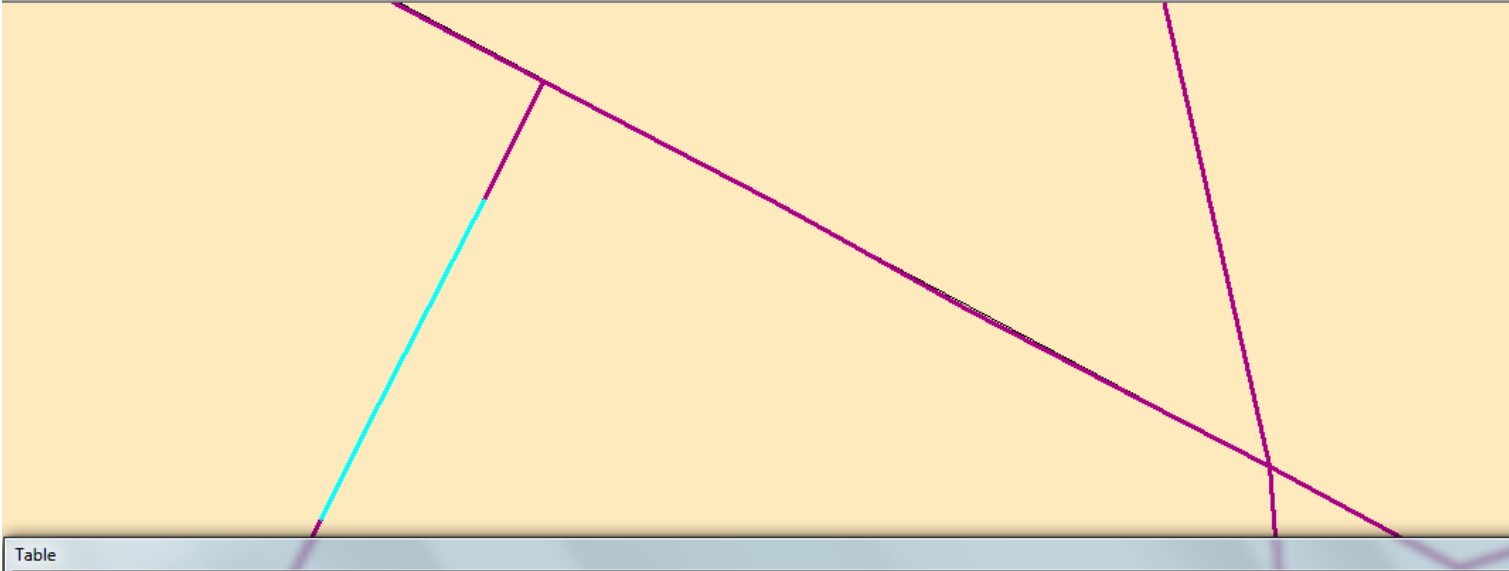

Image 5- Trails Segments

Table

Trails_polyline_split

FID	Shape *	OBJECTID_1	OBJECTID	PRE_DIR	STR_NAME	STR_TYPE	SHAPE_LENG	SHAPE_LE_1	SHAPE_Le_2	Shape_Le_3	ID	Length
0	Polyline	1	29	W	51ST	ST	7594.466545	1.438346	2994.98067	2994.980676	0	354.980676
1	Polyline	1	29	W	51ST	ST	7594.466545	1.438346	2994.98067	2994.980676	0	660
2	Polyline	1	29	W	51ST	ST	7594.466545	1.438346	2994.98067	2994.980676	0	660
3	Polyline	1	29	W	51ST	ST	7594.466545	1.438346	2994.98067	2994.980676	0	660
4	Polyline	1	29	W	51ST	ST	7594.466545	1.438346	2994.98067	2994.980676	0	660
5	Polyline	2	30		BULL CREEK	RD	7503.396513	1.421098	7503.396513	7503.396527	1	243.396527
6	Polyline	2	30		BULL CREEK	RD	7503.396513	1.421098	7503.396513	7503.396527	1	660
7	Polyline	2	30		BULL CREEK	RD	7503.396513	1.421098	7503.396513	7503.396527	1	660
8	Polyline	2	30		BULL CREEK	RD	7503.396513	1.421098	7503.396513	7503.396527	1	660

Image 6- Trail Remainder

Table

Trails_polyline_split

FID	Shape *	OBJECTID_1	OBJECTID	PRE_DIR	STR_NAME	STR_TYPE	SHAPE_LENG	SHAPE_LE_1	SHAPE_Le_2	Shape_Le_3	ID	Length
0	Polyline	1	29	W	51ST	ST	7594.466545	1.438346	2994.98067	2994.980676	0	354.980676
1	Polyline	1	29	W	51ST	ST	7594.466545	1.438346	2994.98067	2994.980676	0	660
2	Polyline	1	29	W	51ST	ST	7594.466545	1.438346	2994.98067	2994.980676	0	660
3	Polyline	1	29	W	51ST	ST	7594.466545	1.438346	2994.98067	2994.980676	0	660
4	Polyline	1	29	W	51ST	ST	7594.466545	1.438346	2994.98067	2994.980676	0	660
5	Polyline	2	30		BULL CREEK	RD	7503.396513	1.421098	7503.396513	7503.396527	1	243.396527
6	Polyline	2	30		BULL CREEK	RD	7503.396513	1.421098	7503.396513	7503.396527	1	660
7	Polyline	2	30		BULL CREEK	RD	7503.396513	1.421098	7503.396513	7503.396527	1	660
8	Polyline	2	30		BULL CREEK	RD	7503.396513	1.421098	7503.396513	7503.396527	1	660
9	Polyline	2	30		BULL CREEK	RD	7503.396513	1.421098	7503.396513	7503.396527	1	660
10	Polyline	2	30		BULL CREEK	RD	7503.396513	1.421098	7503.396513	7503.396527	1	660

Image 7- Trail Length of 660ft

Work to be completed

The final work that needs to be completed in order to perform the analysis will proceed after the division of the trails and creeks into equal segments has been completed, this will allow us to move forward in creating the shade index. Once the shade index has been created, then we can analyze the relationship of the shade distribution within the Parks, Neighborhoods, and Watersheds. Once the final maps have been developed, we will create CD's with the project data, a website which will contain the proposal, progress, and final report documents, as well as professional poster that will be displayed in the Geography Department.

Project Conclusion

The work that has been completed for the project puts the Austin Urban Trails team on schedule. This allows us to move forward towards our final analysis. Next we need to decide on how the trails will be divided and also determine how the creeks will be split. The project to develop shade index is moving along well. Even with all the changes that have occurred, we will still be able to complete the project assigned by Austin Urban Forestry. We do not expect any further problems that would keep us from producing our final output on the date determined.