

# Edmonton Edible Fruit Tree Proposal

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## Executive Summary

This executive summary presents a proposal regarding edible fruit tree management within the urban areas of the City of Edmonton, Alberta Canada. Edible urban forests contribute to livability and promote beauty and sustainability within cities.

The City of Edmonton is in plant hardiness zone 3a which is known for very cold winters and short warm summers with longer daylight hours. Although there are more varieties of edible trees grown in other growing zones (i.e., temperate, sub-tropical or tropical zones), certain edible trees can thrive within the urban areas of the City of Edmonton. By planting and encouraging others to harvest in these urban areas this can help residents to understand what can grow locally and encourage sustainability.

The objective of this project is to promote and facilitate the harvesting of urban edible forests by residents. To achieve this, the project will emphasize two main areas: expanding the existing canopy coverage and identifying the healthiest tree species while maintaining a balance with diverse varieties.

### Project Goals:

- **Expand the urban canopy:** Over the course of the next ten years, our goal is to expand the city's urban canopy by 10 to 20%. By identifying areas with suitable conditions for tree growth and fruit production, we can strategically focus our efforts on increasing the tree coverage in those locations.
- **Foster cost-effective and diverse fruit production:** We aim to identify tree species that are not only healthy and capable of producing abundant fruit but are also cost-effective to maintain. By considering factors such as maintenance requirements, disease resistance, and water consumption, we can ensure that the chosen tree species are sustainable and financially feasible in the long run. Additionally, promoting diversity in tree species selection will enhance ecological resilience and minimize the risk of pest and disease outbreaks.
- **Community engagement and social cohesion:** Edible urban forests provide opportunities for community engagement, social interaction, and learning where neighbors, schools, and community groups come together to cultivate, harvest, and share. The goal would be to share the interactive map with users of species types and/or areas of the city where edible forests exist for harvesting.

The intended audience for this presentation will be primarily to the Director of Urban Planning and their department stakeholders, presented by a Senior Planner for the City of Edmonton (see attached persona document)

The dataset that will be utilized is the “Edible Fruit Trees” dataset provided by the City of Edmonton as part of their open data portal <https://data.edmonton.ca/>. This public dataset is clean and up to date that includes valuable information on tree trunk diameter, tree health, types of edible trees, along with their geo-locations.

The findings will be presented through a comprehensive data story. There will be a geographical map used to identify species and provide some neighborhood-based analysis. As well there will likely be scatterplots or bar charts to help identify species that are healthy, that can be cost-effective and diverse.

Challenges:

- Canopy expansion strategy: Determining the most suitable areas for canopy expansion requires careful analysis of factors such as existing tree coverage, land availability, and community needs. A comprehensive assessment of these variables will help identify priority neighborhoods where tree planting efforts should be concentrated. Some of this type of data may not be available within the existing dataset.
- Cost-effectiveness: Based on the data assumptions, it is possible to argue that planting one species more than another, particularly if it is relatively healthy, could be considered a cost-effective choice. However, since the cost of the plant is not provided in the data, this remains an assumption.

Other areas to gain insight from this project include identifying edible forest gaps within the city that can be improved? Is there a correlation between tree age and health? and which species generally perform better in downtown urban environments vs suburbs?

PERSONA 1: LIN

AGE: 29

GENDER: MALE



*“The City of Edmonton would like to promote edible urban forests as part of our general urban planning committees. We also have an obligation to the public to promote such forests.”*

Lin needs to present findings on the status of edible trees within the City of Edmonton. As a goal to increase the overall canopy by 10% to 20% in the next 10 years an interactive map needs to be published for external users as well as for planning. Lin would like to turn the findings into part of the overall urban planning process.

**Role:** Senior Urban Planner

**Organization:** City of Edmonton

**Goals:**

- Use existing edible tree database to map out by geo location each tree and by neighbourhood.
- Identify healthy species of edible trees.
- Be able to make a case for more diversity of edible trees.
- Be able to identify areas within the city that need more edible forests.

**Challenges:**

- Will be presenting to a highly analytical group of directors and planners that are responsible to the public on spending tax money.
- He is good at numbers, and statistics but not at providing an overall general picture of the project goals.
- Will need to present a data story that highlights the goals of expansion but also be able to promote it externally to the public as part of a city initiative towards education and sustainability.



***“I am responsible to the public to oversee land use management and the planning of such activities. The City of Edmonton would like to look to the future with sustainability in mind and expand our current initiatives in urban forest planning.”***

Sade is extremely busy with managing land use within the city. Because she needs to engage with other directors within the city as well as the public, she promotes full transparency. She is required to work closely with various city officials, developers, and other departments to facilitate the implementation of planning initiatives. She relies on her team to know the details but for her a high-level understanding is best from the very beginning of any presentation.

**Role:** Urban Planning Director

**Organization:** City of Edmonton

**Goals:**

- Wants clear high-level information but if she asks for details, they need to be provided.
- Be able to identify areas within the city that could be zoned for future edible forests.
- Would like an interactive map of the current edible forests, using existing edible tree database to map out by geo location and by neighbourhood.
- She would like to see data on healthy species and diversity of edible trees, but the planning of those details will defer to the urban planners.

**Challenges:**

- High level information will be required but at times but if Sade asks specific questions those details need to be ready.
- Very interested in how we can promote edible forests to the public.
- Will be interested in neighbourhoods as there are many other zoning and planning happening at the same time.

**Context:**

- A general urban planning meeting where other departments will present their projects to ensure alignment. There will be 20+ people looking at a big screen in a large board room. No print outs due to green initiatives.




# Edmonton Edible Fruit Tree Dataset

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I downloaded the Edible Fruit Trees csv file from last updated on June 26, 2023. Data provided by the City of Edmonton as part of their open data portal for public use.

Please note the following columns that were present in this dataset with my notations in the “Notes” column on each data point.

Column Name	Description	Type	Indicator	Notes
ID	City of Edmonton Tree Identification Number	Number	#	Lots of Null Values
NEIGHBOURHOOD_NAME	Neighbourhood name where tree resides.	Text	T	No Null
LOCATION_TYPE	General location where a tree is planted.	Text	T	No Null
SPECIES_BOTANICAL	Botanical Name of Species	Text	T	No Null
SPECIES_COMMON	Common name of Species. Cultivar indicated when known.	Text	T	No Null
GENUS	Genus identifier for tree	Text	T	No Null
SPECIES	Species identifier for tree	Text	T	Blank values 1664 out of 430183 records, as well as “X” which is unknown value or relation
CULTIVAR	Cultivar name of tree if known or applicable	Text	T	Blank values 19755 out of 430183 records

DIAMETER_BREAST_HEIGHT	Diameter of trunk in centimetres. Measured at 1.2 metres from ground level.	Number	#	No Null
CONDITION_PERCENT	Estimated condition of tree health and quality. Measured as a percentage.	Number	#	No Null but there are 5063 of 430183 records with 0 number value
PLANTED_DATE	The date a tree was planted, if known.	Date & Time		No Null
OWNER	City owned trees have several different maintenance programs in place. "Owners" are indicated in this column to show that arrangement if known.	Text	T	No Null
Bears Edible Fruit	A Yes/No value that indicates if the tree is an edible fruit bearing tree.	Text	True/False	No Null
Type of Edible Fruit	If the tree bears edible fruit, the type of edible fruit is indicated. If the tree does not bear edible fruit, then the value is N/A.	Text	T	No Null
COUNT	Unique count id to be used for reporting purposes.	Number	#	No Null
LATITUDE	Horizontal Geographic Coordinate	Number	#	No Null
LONGITUDE	Vertical Geographic Coordinate	Number	#	No Null
LOCATION	Location	Location		No Null
Point Location	Location	Point		No Null

### **Initial Filtering Prior to Loading in Tableau**

- Since I only needed to review trees that bear edible fruit, I decided to remove all False values from column "Bears Edible Fruit" and select only True. This narrowed down my records from a total of 381,168 False records to 49,015 True records out of a total 430,183 records. I was able to remove 89% of the data I did not need for analysis and focus on the 11% of edible fruit trees.

### **Data Cleaning in Tableau**

- Column ID had many NULL values and since I did not need this datapoint as part of any analysis as there were other ways to identify individual trees with the dataset.
- Column SPECIES had many NULL values (1664 records) as well as a value in X that was unknown in its relation to the data (13,742 records). Since I already had the column SPECIES\_COMMON and SPECIES\_BOTANICAL that was more than enough data to identify the type of edible fruit tree it was.
- Column CULTIVAR had many NULL values. There were 19,755 records. This refers to the cultivated variety or plan that has been selectively bred for specific desired characteristics. Although it would be nice to have full data on this to dive deeper into the healthy cultivar edible tree types, this is not the goal of this project and could be set aside. I removed this from the dataset.
- Column COUNT only had value for each row and that was the number 1. I chose to remove it and add a notation within my visualization that for each datapoint it always represents 1 tree.

### **Reviewing Data in Tableau**

- There appears to be no problematic outliers. In review of the latitude/longitude coordinates all points are within the City of Edmonton.
- In review of the data within the data source pane, all data types correspond correctly to their actual stored values (i.e., text to string, number to number whole and latitude/longitude coordinates map to their correct geographical role)

*\*\*Screen Shot of Data Source in Tableau enclosed separately.*

# Edmonton Edible Fruit Tree – Final Project

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URL Link to final project:

<https://public.tableau.com/app/profile/shannon.wilson5911/viz/EdmontonEdibleFruitTreeProjectFinal/Story1>

## Design choices based on personas.

**Interactive KPI Dashboard:** Understanding that Lin is highly analytical and adept at handling numbers and statistics, I decided to create an interactive Key Performance Indicators (KPI) dashboard. This dashboard would showcase the average health of each type of edible tree, the total number of trees planted, and neighborhood-specific data. The interactive nature of the dashboard allows Lin to explore data at various levels of granularity and gain insights easily.

**Data Storytelling Visualizations:** Knowing that Lin struggles with presenting an overall general picture of project goals, I focused on creating data visualizations that give an overall picture. I used bar charts, and neighbourhood tree maps to convey complex information in a visually appealing and easy-to-understand manner. I also used colour to help highlight a range of values.

**Public-Friendly External Map:** To address Sade's interest in promoting edible forests to the public and providing high-level information, I designed an external map that is user-friendly and visually appealing. This map is easily filterable, allowing the public to explore the edible trees planted in the city and their locations. Additionally, each type of edible tree is represented by a distinct color, facilitating effortless identification on the map. This enhancement further enhances the map's usability and aesthetics, encouraging greater public engagement in the city's initiative towards education and sustainability.

## Comparison with Original Project Proposal:

After the first draft of my story points, I gained deeper insights into the data, leading to clearer conclusions. I discovered certain trees that performed exceptionally well despite being less frequently planted. To enhance the clarity of my findings, I added a few more annotations to the visualizations.

I also received valuable feedback on my external map, which prompted me to optimize its design. I removed a redundant chart, allowing the map to take center stage. By implementing user-friendly filters, users can now explore the data more efficiently. Additionally, I increased the size of the map to reduce clutter and improve readability of the data points.

In my KPI dashboard, I made significant improvements to enhance user experience. I replaced a visually overwhelming highlight table of neighborhoods with a simpler and more intuitive heat map. This change not only reduced eye clutter but also made it easier for users to grasp the overall trends at a glance.

These refinements have made my visualizations more effective in conveying insights and enabling better data-driven decision-making.